Prince of Wales Landscape Level Analysis Project

Twin Mountain Timber Sale

Final Unit Cards

Unit Card Introduction

The unit cards are presented in numerical order and include maps and narratives describing site-specific information about each unit, the silvicultural prescription and any unit-specific resource concerns and protection or mitigation measures related to those concerns. Resource concerns are mitigated by unit design and adherence to Forest Plan standards and guidelines and best management practices (BMPs).

All GIS layers are not snapped to each other. There are "slivers" shown on the unit card maps. Some GIS layers were based on orthophoto interpretation and have not been verified on the ground. Therefore, some layers may overlap other layers in GIS, but will be correct when implemented on the ground. As stated in the FEIS, there will be no harvest in Tongass Timber Reform Act (TTRA) buffers, Old Growth Reserves, or Inventoried Roadless Areas. So while some maps may show a sliver of harvest in one of these areas the layout crew will not place the unit in these areas.

The unit card narratives and maps, in combination with the Prince of Wales Landscape Level Analysis (POW LLA) Project Record of Decision (ROD), Final EIS, and GIS map layers, would be used during the implementation process to ensure that all aspects of the project are implemented within applicable standards and guidelines. Some adjustments to the prescription, logging system, or changes to unit boundaries can be expected during implementation as needed to better meet specific on-site resource management and protection objectives. During implementation additional resource concerns may be identified. Any adjustments and changes will follow the direction outlined in the Implementation Plan. This direction establishes guidance on how to document and review adjustments made from the submitted unit during a workshop and actual implementation design. The primary purpose of the process is to determine if actual implementation is still within the scope of the submitted unit. In the event that a unit needs to be changed because of on-the-ground conditions, the following criteria will be used to determine whether to defer the unit until the next workshop.

- Changes will be implemented if they do not require the location to be adjusted and result in similar or lesser impacts as what was analyzed and displayed for the proposal. Documentation of the review will be placed in the implementation record.
- If the location needs to be substantially adjusted, the design has a substantial change, or circumstances are discovered relevant to environmental concerns, then the Line Officer would defer the activity until the next workshop.

Any activity that is deferred until the next workshop will begin the implementation process over and will proceed through each step again.

The District Ranger will consider this interdisciplinary review and will make a recommendation to the Responsible Official on whether or not these adjustments represent: a substantial change or circumstances are discovered relevant to environmental concerns. The Responsible Official will evaluate the District Ranger's documentation and recommendation and will then determine if the unit or proposal needs to be deferred until the next workshop.

The following text describes the layout of the unit cards and provides general information on the harvest treatments and resource components of the unit cards. This information is important to consider in conjunction with the more specific information provided on the cards. Additionally, this introduction to the unit cards is designed to provide specific direction regarding the implementation of the activity that pertains to certain circumstances that occur across multiple

units. Rather than repeat this information on each individual unit card, the direction for that circumstance is provided here. For example, under Even-aged Systems within the Harvest Treatments and Silvicultural Systems section below, the direction for mitigating windthrow along harvest opening edges is provided once rather than being repeated in each individual unit card text. This direction applies to all units being proposed for even-aged management.

Unit Card Header Information

Each unit card has a header block with information used to generally describe the unit's size, location, and volume proposed for harvest. Each header block contains the following information:

- Unit Number: This is the number assigned to identify the unit.
- Total Harvest Unit Acres: This is an estimate of harvest acres within the unit using aerial photos and GIS information. These numbers exclude areas within the overall unit boundary that have been set-aside to meet standards and guides or for other resource concerns. The numbers have been rounded. Final acres will be determined after all surveys and final traverse are completed.
- Prescription: The prescription codes for the proposed treatment are EA for even-aged and UA for uneven-aged management.
- VCU Number: The Value Comparison Unit (VCU) the proposed harvest area is within.
- Harvest System: The method by which the timber is planned to be removed or yarded from the unit. Final methods will be determined after all field surveys are completed.
- Net Harvest Volume (MBF): This is the estimated volume in thousand board feet (MBF), available for harvest in the unit as determined from field estimates and stand examination plots. Final volume amount in thousand board feet will be determined after all surveys and final cruise are completed.
- Land Use Designation (LUD): The Land Use Designation(s) the proposed harvest unit is within.

Harvest Treatments and Silvicultural Systems

Activities described here follow Forest Plan (2016) and POW LLA Project Record of Decision (ROD) direction. Forest Plan Land Use Designation (LUD) goals, objectives, and desired conditions set the basis for selecting appropriate general silvicultural systems. More specific project-level direction on prescription development comes from the implementation decision trees and activity cards described in the POW LLA Project ROD (2019). Activity decision trees follow through a set of existing conditions and are refined by Forest Plan direction and resource constraints and ultimately lead to a set of appropriate actions - or in some cases, inaction - to reach a desired condition. Activity cards describe silvicultural goals, objectives, and limitations that can occur on a variety of land types with a given set of existing conditions based on decision tree guidance.

Silvicultural systems refer to a complete set of treatments used to manage forest stands and forest landscapes over long periods of time. This process includes the harvest or regeneration of the stand, intermediate cuttings, and other treatments necessary for the development and replacement of the forest stand. Silvicultural systems are applied through prescriptions: the written records of the examination, diagnosis, and treatment regimens prescribed for the stand. The final prescriptions, including detailed sale layout and marking instructions for any harvest units, will

be completed after field reviews are completed by specialists, public workshop, and Out-year Plan comment period.

Each unit card contains a narrative summarizing any concerns, responses, BMPs, and mitigations. The silviculture section contains a brief synopsis of the existing condition and the planned prescription to move the stand from the existing condition to the desired condition and any specific mitigation measures that are needed. The existing condition text documents stand-specific information such as stand structure; insect, disease and defect ratings; and windthrow risk. These ratings are for the unit as a whole. Specific portions of the unit may vary from the overall ratings. In some instances, the windthrow discussion in the Fisheries section, which is specific to riparian management areas (RMAs), may differ from the overall unit rating. The additional detail provided for RMAs is necessary for determining reasonable assurance of wind firmness (RAW) requirements along certain streams.

Sometimes portions of the original logging systems transportation analysis (LSTA) polygon are not scheduled for harvest. These areas are typically where standards and guidelines exclude timber harvest because of specific ground conditions. This assures the conservation of certain resources within what would otherwise be areas available for harvest. Unsuitable soils and riparian management areas are examples. These areas must be excluded from harvest regardless, because they physically have been determined unsuitable for harvest. In other cases certain portions of the LSTA polygon are excluded from harvest to achieve management objectives required by Forest Plan direction, although there are no specific physical conditions making the area unsuitable for harvest. Visual buffers and some legacy areas are examples. Sometimes portions of the original LSTA polygon were found to have timber with volume and/or value that obviously would not support the cost of logging. These areas are usually muskeg inclusions or low-volume–high-defect cedar areas where poor drainage restricts tree growth. These areas typically have a merchantable sawlog volume of less than 8 MBF per acre, which is considered as unsuitable timber. In other instances, portions of the LSTA polygon have been deferred from harvest at this time to meet the specific design criteria or mitigations.

Legacy buffers depicted on the unit card maps are representations. The actual implementation may vary but must meet the same planned objectives. In these areas there are generally no physical circumstances that preclude harvest, however, they may be planned to coincide with or expand on such areas if the opportunity exists. Legacy areas are generally more flexible in how they are located within the unit as long as they achieve their design objectives.

The intent of the Legacy Standard and Guideline is to ensure that sufficient residual trees, snags, and clumps of trees remain in timber harvest units within VCUs that have had concentrated past timber harvest activity and are at risk for not providing the full range of matrix functions in order to meet the intent of the conservation strategy while providing flexibility to address on-the-ground implementation issues (Forest Plan 4-86).

In harvest units greater than 20 acres within Legacy VCUs, leave 30 percent of the entire unit (based on area) in legacy forest structure. Legacy forest structure should remain indefinitely after harvest and shall be tracked through the life of the next stand.

Legacy forest structure should be arranged primarily in clumps. The intent of leaving legacy is to provide structure within the opening; therefore, clumps should be left well inside the unit, compatible with logging system capabilities. Clumps may be placed along the external yarding boundaries within harvest units in situations where cable logging systems make leaving residual trees in other parts of the unit impractical due to operational or safety considerations. Structure

left within units for other resources counts towards the 30 percent, provided it is representative of the existing old-growth stand characteristics, including age, size class, species composition, and structural components found within the original planned unit. Clumps and dispersed retention trees should include some of the largest, oldest, live trees; decadent or leaning trees; and hard snags occurring in the unit.

For the POW LLA Project the amount of legacy required by unit was determined based on the size of even-aged openings that might be created in combination with any adjacent LSTA polygon areas that were planned to be retained as legacy. Units planned for 20 acres of harvest or less do not have legacy requirements. Uneven-aged units (partial cuts) do not require legacy because no opening greater than 20 acres is created.

The required and currently mapped legacy acreage is stated in the silvicultural prescription prepared for each unit. Direction is also provided in the prescription regarding how legacy was placed. Legacy areas denoted may be adjusted as needed so long as the objective of the placement is met. For example, if legacy is planned to coincide with areas of unsuitable soils and those areas are further refined during implementation, the legacy areas should be adjusted so they encompass the change, so long as the new areas meet the stand structural requirements stated in the Forest Plan.

Desired Future Condition for Timber Production Stands in the Project Area

The desired condition for stand growth for timber production purposes in the Project Area is that they be as productive, healthy, and windfirm as possible, while still retaining residual trees as needed to meet direction in the Forest Plan. The majority of old growth stands in the project area contain trees that are over-mature and unhealthy with decay and weather damage that exceeds new growth. These stands do not currently meet the desired condition.

Even-aged Systems (Clearcut)

An even-aged system produces stands that consist of trees of the same or nearly the same age. A stand is even-aged if the range in tree ages normally does not exceed 20 percent of the rotation age (the age at which the stand is harvested). Stands would not be reentered for a regeneration cut until the next rotation in approximately 100 years. The regeneration method chosen to achieve even-aged management is clearcutting. Where this treatment is recommended, it has been determined that it is optimal for the site.

Even though all or a majority of the merchantable trees within a unit would be harvested by clearcutting, some merchantable-sized trees are often retained within the unit for resource protection requirements. These may include stream buffers along unit boundaries or those that protrude into units and visual buffers. Reasonable assurance of windfirmness (RAW) buffers may also be applied to unit edges and stream or visual buffers that are determined to be at risk for wind damage after harvest.

Units that are proposed for even-aged management have conditions that do not currently meet nor are on a trajectory to meet the desired condition. Even-aged management using clearcutting is the optimum method to move these stands from the existing condition to the desired condition. Even-aged management minimizes defect and disease in the future stand to the greatest extent possible.

The Forest Plan (pages 4-68 to 4-69) requires a number of considerations/determinations before this activity can be applied. Primarily there must be no visual, soil, regeneration, or other

concerns requiring mitigation through other silvicultural systems. Secondly, clearcutting (and clearcut with reserves) is limited to areas where it is essential to meet Forest Plan objectives and may involve one or more of the following circumstances for justification:

a) To establish, enhance, or maintain habitat for Endangered, Threatened, and Sensitive species.

b) To enhance wildlife habitat or water yields, or to provide for recreation, scenic vistas, utility lines, road corridors, facility sites, reservoirs, or similar development.

c) To rehabilitate lands adversely impacted by events, such as fires, windstorms, or insect or disease infestations.

d) To preclude or minimize the occurrence of potentially adverse impacts from insect or disease infestations, windthrow, logging damage, or other factors affecting forest health.

e) To provide for the establishment and growth of desired trees or other vegetative species that are shade intolerant.

f) To rehabilitate poorly stocked stands due to past management practices or natural events.

g) To meet research needs.

Clearcutting must be planned in a way that isolated stands of timber will not be created and existing stands of regeneration from previous harvests will not be destroyed. A finding from a Certified Silviculturist that clearcutting is the best method to meet objectives and requirements is necessary. That finding must conform to direction in FSM 2470 Supplement No.: R-10 2400-2005-1 which defines requirements on the use of clearcutting, generally limiting the activity to places where it is necessary to address concerns for insect and disease, windthrow, logging damage, or other factors affecting forest health. For the purpose of this assessment, this means an old-growth stand proposed for clearcutting must have a moderate or high windthrow risk, insect, or disease rating; or to rehabilitate poorly stocked timber lands; or a combination of these factors.

Issues that are addressed by this system:

- Provides for greater volume per acre harvest using ground-based yarding methods and increases employment opportunities for the local wood products industry.
- Minimizes the occurrence of windthrow, logging damage to residuals, and mistletoe infection in the regenerated stand.
- Effectively addresses other disease and/or insect issues.
- Typically improves economic efficiency by lowering the logging costs per MBF.
- For the same reason, layout, sale preparation and administration costs per MBF are also lower.

General Direction Regarding the location of Even-aged Management Unit Boundaries

Design units approximately as shown on the unit card map with adjustments as needed to make boundaries reasonably wind-firm. For example, bring unit boundaries to the edges of existing young-growth or muskeg and to the lee side of a ridgeline where possible. Avoid sharp points,

dips or other deviations in the unit boundary in areas exposed to southerly winds, particularly where high wind risk timber types occur. Review the planned unit design with the district Silviculturist prior to layout to help identify problem areas. Where windfirm edges cannot be located and resources are at risk outside the unit boundary, review is needed for RAW. Interdisciplinary review of RAW zones as described in the fish/watershed section on the unit card or otherwise identified along boundaries should occur at the time of layout to determine the RAW zone prescriptions. The presale lead for the unit should notify the interdisciplinary team (IDT) when preliminary boundaries have been located. At that time the IDT will review boundary locations in the field and determine the appropriate RAW zones and harvest prescriptions.

National Forest Management Act (NFMA) regulations state that 100 acres is the maximum size of created openings allowed for the forest types of coastal Alaska, unless exempted under specific conditions. For the purpose of identifying a created opening size and what constitutes a break between even-aged openings, the Forest Plan requires that leave strips between openings be of sufficient size to be managed as a separate stand or at least 10 acres. Where leave areas are required to reduce the size of an opening, avoid the isolation of suitable timber by leaving an economically operable setting where possible. Riparian management areas may also be used to constitute a break in unit size if they are at least 10 acres in size. Past even-aged harvest areas with adequately restocked regeneration approximately 5 feet tall are no longer considered openings for the purpose of determining the 100 acre size limit.

There are no individual units or combined openings planned that exceed 100 acres.

Uneven-aged Management

Uneven-aged management maintains or creates a stand with trees of three or more distinct age (size) classes, either intimately mixed or in small groups. Trees may be removed individually, or in small groups or strips generally 2 acres or less in area. Distance between groups should be at minimum one tree length apart (120 feet), 200 feet apart in moderate windthrow risk areas, or 300 feet apart in high windthrow risk areas. There is no final rotation age as in even-aged or two-aged systems, but are instead regular, periodic entries designed to maintain three or more distinct age classes and a range of diameter classes in a reasonably well-dispersed manner across the stand. This maintains a stand with relatively consistent tree cover of high structural diversity due to the high variability in tree sizes and individual tree characteristics. This remaining structure generally provides more diverse wildlife habitat than other regeneration systems and also reduces the visual impacts of the harvest area. The timber production goal of uneven-aged management is to economically harvest a percentage of the stand while retaining timber for future economically viable and sustainable entries. The next harvest under uneven-aged management would likely be in 15 to 30 years.

Issues that are addressed by this system:

1. Effectively addresses minor disease or insect issues.
2. Addresses wildlife habitat concerns.
3. Addresses visual constraints.
4. Addresses soil concerns.
5. Addresses wind risk concerns in the stand.

Timber/Yarding

This section of the unit card identifies the yarding system(s) proposed for the unit. It also identifies the roads to be used to access the unit. Proposed and existing system roads are identified by road numbers shown on the unit card maps.

Log yarding practices are based on slope stability, soil disturbance, channel type, and stream class. Additional measures are taken to protect RMAs from possible disturbance associated with tree felling and yarding. Harvest activities near Class I, Class II, and Class III streams require that trees are felled away from the stream buffer, are yarded across Class III stream courses, and where applicable, are fully suspended to minimize the exposure of mineral soil. Trees near Class IV streams are felled away from the stream whenever feasible and logging debris introduced into Class IV streams is removed. Class IV streams are treated as part of the hillside, under slope stability standards and guidelines. Suspension requirements are used to minimize soil erosion, mass movement, and formation of new channels.

Engineering/Roads

Detailed information on required road construction and reconstruction is provided in this section, including road lengths for all roads and road numbers for proposed and existing system roads. Road numbers are shown on the maps.

Road construction and reconstruction will follow applicable BMPs during layout and construction work. In particular adhere to the following BMPs: 12.17, 13.11, 14.2, 14.3, 14.5, 14.6, 14.7, 14.8, 14.9, 14.10, 14.12, 14.17, and 14.18. The National Core BMPs will be implemented in this project. The crosswalk between the National Core BMPs and the Region 10 BMPs are in the project record.

Best Management Practices

The following BMPs would be applied in order to protect water quality in the project area as specified in the Forest Plan. These BMPs apply whenever the situation warrants them. For example, BMP 12.5 applies to any units or roads that involve wetlands; BMPs 12.6, 12.6a, and 13.16 apply to any units and road activities involving streams; BMPs 13.2, 13.9, 13.10 apply to all timber harvest units and log landings; BMPs 14.1, 14.2, 14.3, 14.5, 14.6, 14.7, 14.8, 14.9, 14.10, 14.11, 14.12, 14.15, 14.17, 14.18, 14.19, 14.20, 14.22, and 14.24 apply to road construction, maintenance, and other activities, including quarries (as appropriate); BMPs 14.26 and 14.27 apply to activities at existing LTFs; and BMPs 12.8, 12.17, 13.1, 13.3, 13.4, 13.5, 13.11, 13.12, 13.14, 13.17, and 13.18 apply in general to all timber sale planning and implementation activities. Many of the most relevant BMPs are cited on the unit cards or elsewhere in this introduction, as appropriate.

Watershed Management

BMP 12.5 (Wetland Identification, Evaluation, and Protection): To identify wetland functions and value, and provide appropriate protection measures designed to avoid adverse hydrologic impacts.

BMP 12.6 (Riparian Area Designation and Protection): To identify riparian areas and their associated management activities.

BMP 12.6a (Buffer Design and Layout): To design streamside buffers to meet objectives defined during the implementation of BMP 12.6.

BMP 12.8 (Oil Pollution Prevention and Servicing/Refueling Operations): To prevent contamination of surface and subsurface soil and water resources from spills of petroleum products.

BMP 12.17 (Revegetation of Disturbed Areas): To provide ground cover to minimize soil erosion.

Timber Management

BMP 13.1 (Timber Sale Planning): To incorporate soil and water resource considerations into timber sale planning.

BMP 13.2 (Timber Harvest Design): To incorporate site-specific soil and water resource considerations into integrated timber harvest unit design criteria.

BMP 13.3 (Designating Water Quality Protection Needs on Sale Area/Unit Release Maps): Delineate the location of protection areas and ensure their recognition, proper consideration, and protection on the ground.

BMP 13.4 (Timber Sale Operating Schedule): To ensure that erosion control and timing responsibilities are incorporated into the Operating Schedule.

BMP 13.5 (Identification and Avoidance of Unstable Areas): To avoid triggering mass movements and resultant erosion and sedimentation by excluding unstable areas from timber harvest.

BMP 13.9 (Determining Guidelines for Yarding Operations): To select appropriate yarding systems and guidelines for protecting soil and water resources.

BMP 13.10 (Log Landing Location and Design): To design and construct landings to minimize soil erosion and water quality degradation.

BMP 13.11 (Scheduling and Enforcement of Erosion Control Measures during Timber Sale Operations): To ensure that the Purchasers operations are conducted according to the Timber Sale Contract with respect to soil and water resource protection.

BMP 13.12 (Site Preparation): Maintain sufficient ground cover to minimize soil erosion.

BMP 13.14 (Completion of Erosion Control for Unit Acceptance and Sale Closure): To assure that the required erosion control work is completed before unit acceptance.

BMP 13.16 (Stream Channel Protection – Implementation and Enforcement): To provide the site-specific stream protection prescriptions consistent with objectives identified under BMPs 12.6 and 12.6a. Objectives may include the following:

- Maintain the natural flow regime.
- Provide for unobstructed passage of storm flows.
- Maintain integrity of the riparian buffer to filter sediment and other pollutants.
- Restore the natural course of any stream that has been diverted as soon as practicable.
- Maintain natural channel integrity to protect aquatic habitat and other beneficial uses.

- Prevent adverse changes to the natural stream temperature regime.

BMP 13.17 (Nonrecurring "C" Provisions For Soil and Water Quality Protection): To insert nonrecurring (Special) "C" provisions into the Timber Sale Contract to protect soil and water resources, where standard "B" or "C" provisions do not apply or are inadequate to protect watershed values.

BMP 13.18 (Modification of the Timber Sale Contract): To seek an Environmental Modification of the Timber Sale Contract if new circumstances or conditions indicate that the timber sale will cause irreparable damage to soil, water, or watershed values.

Transportation and Other Facilities Management

BMP 14.1 (Transportation Planning): To assure soil and water resources are considered in transportation planning activities.

BMP 14.2 (Location of Transportation Facilities): To assure water resources protection measures are considered when locating roads and trails.

BMP 14.3 (Design of Transportation Facilities): To incorporate site-specific soil and water resource protection measures into the design of roads and trails.

BMP 14.5 (Road and Trail Erosion Control Plan): Develop erosion control plans for road or trail projects to minimize or mitigate erosion, sedimentation, and resulting water quality degradation prior to the initiation of construction and maintenance activities. Ensure compliance through effective contract administration and timely implementation of erosion control measures.

BMP 14.6 (Timing Restrictions for Construction Activities): Minimize erosion potential by restricting the operating schedule and conducting operations during lower risk periods.

BMP 14.7 (Measures to Minimize Mass Failures): Minimize the chance and extent of road-related mass failures, including landslides and embankment slumps.

BMP 14.8 (Measures to Minimize Surface Erosion): Minimize the erosion from cutslopes, fillslopes, and the road surface, and consequently reduce the risk of sediment production.

BMP 14.9 (Drainage Control to Minimize Erosion and Sedimentation): Minimize the erosive effects of concentrated water flows from transportation facilities and the resulting degradation of water quality through proper design and construction of drainage control systems.

BMP 14.10 (Pioneer Road Construction): Minimize sediment production associated with pioneer road construction.

BMP 14.11 (Timely Erosion Control Measures for Incomplete Projects): Minimize erosion of and sedimentation from disturbed ground on incomplete projects by completing erosion control work prior to seasonal or extended shutdowns.

BMP 14.12 (Control of Excavation and Sidecast Material): Minimize sedimentation from unconsolidated excavated and sidecast material caused by road construction, reconstruction, or maintenance.

BMP 14.14 (Control of In-channel Operations): Minimize stream channel disturbances and related sediment production.

BMP 14.15 (Diversion of Flows around Construction Sites): Identify and implement diversion and de-watering requirements at construction sites to protect water quality and downstream uses.

BMP 14.17 (Bridge and Culvert Design and Installation): Minimize adverse impacts on water quality, stream courses, and fisheries resources from the installation of bridges, culverts, or other stream crossings.

BMP 14.18 (Development and Rehabilitation of Gravel Sources and Quarries): To minimize sediment from borrow pits, gravel sources, and quarries, and to limit channel disturbance from gravel sources permitted for development within floodplains.

BMP 14.19 (Disposal of Construction Slash and Stumps): To ensure that debris generated during construction is prevented from obstructing channels or encroaching on stream, and sensitive karst features.

BMP 14.20 (Road Maintenance): Maintain all roads in a manner which provides for soil and water resources protection by minimizing rutting, road prism failures, sidecasting, and blockage of drainage facilities.

BMP 14.22 (Access and Travel Management): Control access and manage road use to reduce the risk of erosion and sedimentation from road surface disturbance, especially during the higher risk periods associated with high runoff and spring thaw conditions.

BMP 14.24 (Road Obliteration): Reduce sediment generated from temporary or short-term roads and return the land to production by obliterating roads at the completion of their intended use.

BMP 14.26 (Daily LTF Cleanup): Assure cleanup of bark, debris, or other solid materials daily when accumulations are present. Dispose of the materials in an acceptable manner, to prevent water quality degradation.

BMP 14.27 (Log Storage/Sort Yard Erosion Control): To avoid generation of fine particles, and control the overland flow of particles carrying hazardous materials into waterways.

Botany

Forest Plan Standards and Guidelines (page 4-39) direct that adverse impacts of management activities on sensitive and rare plant populations be avoided, minimized, or mitigated. When rare or sensitive plant species are identified in or near a harvest unit, road, or other activity area, a Forest Service botanist will assess the potential impacts on sensitive/rare plants and if necessary recommend mitigation measures to protect the population. Mitigation measures may include, but are not exclusive to, avoiding known sensitive/rare plant populations during project activities, directional falling and yarding of trees away from sensitive/rare plants, and partial retention of forest structure (25 to 50 percent of the basal area) in the area around sensitive/rare plants in forested habitats. Where it is necessary to protect sensitive/rare plant species or communities from a proposed harvest, a Monitoring and Evaluation Plan will be implemented, including a review of the implementation and effectiveness of conservation actions, and the application of adaptive management principles.

All known sensitive or rare plant populations located either within units or within 50 meters (164 feet) of the unit are noted on the unit cards. Unit cards may also include specific actions taken to avoid or mitigate effects to populations. The sensitive/rare plant species potentially affected by one or more unit and listed on the cards include:

Sensitive Plants

- Alaska rein orchid *Platanthera unalascensis*
- Lesser round-leaved orchid *Platanthera orbiculata*
- Lesser yellow lady's slipper *Cypripedium parviflorum*

Rare Plants

- Adder's-mouth orchid *Malaxis monophyllos*
- Cleafleaf ragwort *Senecio moresbiensis*
- Common moonwort *Botrychium lunaria*
- Maidenhair spleenwort *Asplenium trichomanes* ssp. t*richomanes*
- Pacific ninebark *Physocarpus capitatus*
- Rattlesnake fern *Botrychium virginianum*
- Swaying bulrush *Scirpus subterminalis*
- Whiteflower rein orchid *Piperia candida*

Invasive Plant Species

A number of specific invasive plant infestations along roads near or within units have been recommended for post implementation monitoring, based on their limited distribution in the project area and potential for spread. Infestations recommended in the text for monitoring are high priority species that the Tongass is committed to actively tracking where feasible. These infestations are identified on specific unit and road cards.

Additional invasive species treatment, monitoring, and mitigation information for the project area is found in the Invasive Plant Risk Assessment, Invasive Species Resource Report, and the Out-year Plan. The high priority invasive species that are listed on the cards and are located along roads near or within one or more units are:

- Bull thistle *Cirsium vulgare*
- Canada thistle *Cirsium arvense*
- Common St. Johnswort *Hypericum perforatum*

Fisheries

All known streams are presented in the draft unit cards. Changes to stream location and type are anticipated as additional surveys are completed. These streams, and any additional streams found during layout, will be protected by the appropriate BMPs and Forest Plan Riparian Standards and Guidelines. Specific stream characteristics and related protections are summarized below. The type and level of stream protection and mitigation is based mainly on designated stream class and channel process group.

The streams in the unit card maps come from the Forest Service geographic information system (GIS) stream layer, which was last updated in August 2019. The unit cards also include descriptions of all streams that are within 200 feet of a given unit. Streams were assigned unique numbers in the field during surveys. Those numbers are used as labels on the maps and to

differentiate streams in the unit card narratives. The map labels may also include a letter prefix in front of the stream number, but narratives of stream protections for each unit card will not include that letter prefix (example: a stream is called W_507_2.0 on the map, but is called 507_2.0 in the narrative section). The unit card maps have reference grids so that the general location on the map can be provided if a stream number label is not available, or if a stream is not yet mapped in the GIS stream layer.

For each stream the unit card text identifies the stream class, channel type, protection category, flagging color, RMA buffer size, and any other concern. The criteria for buffer size comes from the Forest Plan Standards and Guidelines for Riparian Management Areas (RMAs), and are described below.

Riparian Management Areas

Forest Plan Standards and Guidelines direct the design of RMAs associated with each stream in the project area.

The RMAs vary in width from the edge of the stream channel according to channel type (Table A11) and stream value class. All Class I and Class II streams are protected from commercial timber harvest within a minimum horizontal distance of 100 feet from the bankfull margins. Depending on the channel type and the extent of riparian soils and vegetation, RMA widths can be 140 feet wide or wider on either side of some Class I, Class II, and Class III streams. RMAs adjacent to Class III streams are protected from commercial timber harvest except along palustrine channel types. The RMA widths on Class III streams are topographically delineated along channel types with steep side-slopes and are measured to set distances along other channel types.

Each unit card briefly lists the channel process group, stream class, and corresponding buffer prescription for streams found within 200 feet of the unit. Unit card maps show the location of all streams and the associated RMAs. RMA widths for each Class I, Class II, and Class III streams are prescribed in the unit card narratives.

Unit card narratives also identify those streams that will require a RAW buffer review during implementation; the RAW buffer will be identified by the interdisciplinary team during layout.

Road crossings described on the unit cards are for temporary roads only. System road crossings are discussed in the road cards.

Specific concerns are also briefly listed such as blowdown or erosion occurring within the unit boundaries.

Process Groups and Channel Types

The Tongass National Forest defines stream channel types according to the Channel Type User Guide (Paustian et al.1992, Paustian and Kelliher 2010), the foundation upon which aquatic habitat management prescriptions are developed. Channel types are defined within the context of fluvial process groups that describe the interrelationship between watershed runoff, landform relief, geology, and glacial or tidal influences on fluvial erosion and deposition processes. Individual channel type classifications are defined by physical attributes such as channel gradient, channel width, channel pattern, stream bank incision and containment. Table A1-1 shows the Forest Plan codes used on the unit card narratives.

See the Forest Plan, Figure D-1 (page D-4) for a visual representation of the typical distribution of channel process groups. Each unit card summarizes the protection for a particular unit. Only the channel types found in proposed timber harvest units are listed.

Table A1-1. Channel Types In or Adjacent to Proposed Harvest Units

Process Group	Channel Type (C-Type) Code	Channel Type Description
Alluvial Fan	AFM	Moderate Gradient Alluvial Fan
	AFH	High Gradient Alluvial Cone
Floodplain	FPS	Small Flood Plain
	FPM	Medium Flood Plain
	FPL	Large Flood Plain
High Gradient Contained	HCLw	High Gradient Low Incision, wetland phase
	HCL	High Gradient Low Incision
	HCV	High Gradient Upper Valley
	HCDw	High Gradient Deep Incision, wetland phase
	HCM	High Gradient Moderate Incision
	HCD	High Gradient Deep Incision
Moderate Gradient Contained	MCS	Small Moderate Gradient Contained
	MCM	Medium Moderate Gradient Contained
	MCL	Large Moderate Gradient Contained
Moderate Gradient Mixed Control	MMS	Small Moderate Gradient Mixed Control
	MMM	Medium Moderate Gradient Mixed Control
Low Gradient Contained	LCS	Small Low Gradient Contained
	LCM	Medium Low Gradient Contained
Palustrine	PAS	Small Palustrine
	PAM	Medium Palustrine
	PAB	Beaver Dam/Pond

Stream Value Classes

The stream value class designations in the Tongass National Forest are based primarily on presence or absence of fish and fish type, and secondarily on stream morphology. The Forest Plan recognizes four stream classes based on the following criteria:

Class I: Streams and lakes with anadromous or adfluvial fish or fish habitat; or high quality resident fish waters, or habitat above fish migration barriers known to be reasonable enhancement opportunities for anadromous fish.

Class II: Streams and lakes with resident fish or fish habitat and generally steep (6-25 percent or higher) gradient (can also include streams with a 0-6 percent gradient) where no anadromous fish occur, and otherwise not meeting Class I criteria.

Class III: Streams are perennial and intermittent streams that have no fish populations or fish habitat, but have sufficient flow or sediment and debris transport to directly influence downstream water quality or fish habitat capability. For streams less than 30 percent gradient, special care is needed to determine if resident fish are present.

Class IV: Other intermittent, ephemeral, and small perennial channels with insufficient flow or sediment transport capabilities to have immediate influence on downstream water quality or fish habitat capability. Class IV streams do not have the characteristics of Class I, II, or III streams and have a bankfull width of at least 0.3 meter (1 foot).

Stream Protection and Mitigation Actions by Stream Category

The following protection and mitigation will be applied by stream category as defined in BMP 13.3 to all streams designated by each category by harvest unit.

Category A: These stream reaches are flagged with blue and white (B/W) candy striped flagging. Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream Course Protection Plan will be developed for that buffer. Additional Aquatic Habitat Management Handbook (AHMU) buffers and selective harvest buffers may apply as specified in the specific Unit Card. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers.

Category B: These stream reaches are flagged with orange and white (O/W) candy striped flagging. Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified in the Unit Card. Total no cut buffer equals the no programmed commercial harvest buffers.

Category C: These stream reaches are flagged with green and white (G/W) candy striped flagging. In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.

Category A, B and C: All stream categories will implement BMPs 12.6, 12.6a, 13.9, 13.14, and 13.16. In addition to road crossings, for all units with shovel logging, equipment crossing of streams must comply with BMP 13.9 and 13.16.

Scenery

The effects of timber harvest upon scenic integrity within these planned units of the POW LLA project are expected to be in compliance with the 2016 Forest Plan components for Scenery. If impacts to scenic integrity are expect to result in a unit not meeting the 2016 Forest Plan, it will be noted in the unit card. If visual buffers are implemented, as noted in the Even-aged Systems (Clearcut) section, these buffers would be reviewed for windfirmness and a RAW buffer used, if necessary. During layout, changes to unit sizes of more than a 25 percent increase will require review by a scenery specialist. Changes to logging system plans that will result in more scenic impact than originally planned will also require review by a scenery specialist.

Karst and Cave Resources

The major focus and intent of the Tongass National Forest karst management strategy is to identify and protect karst systems and the caves and associated resources contained within, as per the requirements of the Federal Cave Resources Protection Act of 1988 (FCRPA). The FCRPA is the primary U.S. law affecting caves. It requires protection of significant caves on federal lands. A cave must possess one or more of the criteria outlined in 36 CFR Part 290.3 to be determined "significant". Though "non-significant" caves may exist on the Forest, most meet the criteria for "significant". The intent of this Act is to protect cave resources not karst resources. However, it is important to recognize that caves and associated features and resources are an integral part of the karst landscape. Karst must be managed as an ecological unit to ensure protection of the associated cave resources. In practice, the Forest gives equal protection to important karst features, sinking or losing streams, springs, and caves. A Forest-wide treatment of karst and cave resources may be found in Chapter 4 of the Forest Plan, Karst and Cave Resources, Forest-wide Standards and Guidelines, pages 4-23 to 4-25 and Appendix H, pages H-1 to H-10.

Complete a Karst Landscape Assessment. This is a four-step process. 1) Identify potential karst lands, 2) Inventory the karst and cave resources, 3) Delineate the karst hydrologic system and catchment area(s), and 4) Assess the vulnerability of the karst terrain to the proposed management activity. The vulnerability categories and their criteria are as follows:

1. Low Vulnerability Karstlands. Low vulnerability karst lands are those areas where resource damage threats associated with land management activities are negligible from a karst management perspective. No special provision for the protection of karst values is considered necessary. It is possible that karst areas with high vulnerability will be found within and adjacent to areas found to be of low vulnerability. Along such boundaries or margins, apply guidelines for protecting these high vulnerability areas outlined under "Moderate Vulnerability Karstlands" below. See Appendix H for additional guidance.
2. Moderate Vulnerability Karstlands. The moderate vulnerability karst lands are those areas where resource damage threats associated with land management activities in the areas are appreciably greater than those posed by similar activities on low vulnerability karst lands adjacent to areas of high vulnerability. Management objectives on these lands should provide for other land uses while taking into account function and biological significance of the karst and cave resources within the landscape. Timber harvest and related activities could be conducted in such areas under more restrictive guidelines than normally employed on lands underlain by insoluble bedrock. To protect the fragile soils found here, as a minimum, the yarding system selected may be required to achieve partial suspension. It is probable that individual features or areas with high vulnerability will be found within and adjacent to areas found to be of moderate vulnerability. Along such boundaries or margins, following guidelines apply. See Appendix H for additional guidance.
    a) Road Construction. Existing roads will be utilized in preference to the construction of new ones. Roads should avoid sinkholes and other collapse features and sinking or losing streams. Roads should not divert water to or from karst features. Measures shall be taken to reduce erosion and sediment transport from the road surface and cut slopes. Assess the need for ditches and culverts. Sediment traps, cut and fill slope revegetation, and road closure and revegetation may be appropriate. Because subsurface drainage networks may be more open to the surface in moderate vulnerability areas, additional design criteria may be required. Such criteria may relate to road construction methods, blasting, culvert placement and density, and

sediment retention and erosion prevention. Road construction restrictions described below under “high-vulnerability prescriptions” may be required for these areas.

b) Quarries. Existing quarries will be utilized in preference to the construction of new ones. No quarry shall be developed atop karst without adequate site survey and design. Quarries should be properly closed after abandonment.

c) Karst Feature Buffers It is probable that individual features or areas with high vulnerability will be found within and adjacent to areas found to be of moderate vulnerability. Along such boundaries or margins the following guidelines shall apply:

   i. No surface disturbing activity such as timber harvest, road construction, and/or quarry development shall occur within a minimum of 100 feet of the edge of a cave, sinkhole, collapse channel, doline field, or other collapse karst feature. Manage an appropriate distance beyond the no-harvest zone to provide for a reasonable assurance of windfirmness (RAW) of that zone. It is suggested that the specific design of the buffers be an IDT recommendation working with the karst management specialist during the planning process for any given project. Not all features will require the RAW buffer considering the specific characteristics of each. It is not intended that this level of protection would be applied for relatively minor, isolated features (i.e., where explicit or special management measures would not normally be required). Appropriate protection measures for minor features should be designed on a case-by-case basis as field assessed by a karst management specialist. It is suggested that the specific design of the buffers be an IDT recommendation working with the karst management specialist during the planning process for any given project. Not all features will require the RAW buffer considering the specific characteristics of each.

   ii. No surface disturbing activity such as timber harvest, road construction, and/or quarry development will occur on lands that overlie a known "significant" cave. "Overlie" is defined here as the area between lines projected from the outside walls of the cave passage at a 45-degree angle to the surface.

   iii. As cave discoveries are made and those caves are mapped and inventoried, it is quite probable that very significant cave systems will be discovered. These might contain significant paleontological, cultural, or biologic resources or the system is of a particular size to warrant an extra level of protection. Cave systems such as El Capitan Cave on Prince of Wales Island, Arabica and associated caves on Heceta Island, Solstice Cave on Chichagof Island, and the Calamity Creek Caves on Revillagigedo, Island are examples. It is suggested that on a case-by-case basis for such caves, a Geologic Special Area be defined and managed as such to protect these systems.

   iv. Require protection of all sinking or losing streams and their tributaries irrespective of whether the channels carry perennial, ephemeral, or intermittent flows. A non-harvest buffer is required of a minimum of 100 feet from the edge of a sinking or losing stream within no less than ¼ mile (1320 feet) upstream of their swallow hole or loss point. Additional protection beyond this point many be needed and should take into consideration parameters such as gradient, channel type, soil characteristics, and susceptibility to mass wasting and erosion along the stream’s or tributary’s course or within the watershed. The karst management specialist should work in conjunction with hydrologists and soil scientists to design

additional stream protection if needed. Manage an appropriate distance beyond the no-harvest zone to provide for a reasonable assurance of windfirmness of that zone. In the event that the stream is less than 1/4 mile long, the stream will be buffered to the stream's source.

v. The area surrounding resurgences should be protected to maintain the environment surrounding the springs and the quality of the waters flowing from them. Resurgences can however be classified as moderate or high vulnerability dependent upon their size, the habitat they provide, and the level of atmospheric connectivity between the resurgence and the underground karst system. Minor resurgences which seep out of the ground between gravels with almost no connectivity between the open atmosphere and the underground system will be classified moderate vulnerability. Appropriate protection measures for moderate vulnerability resurgences and springs should be designed on a case-by-case basis by a karst management specialist. All other resurgences will be classified as high vulnerability and protected as described in "Karst Feature Buffers" above. Special consideration should be given to the area immediately surrounding the springs to protect the flora and fauna often associated with the spring when considering the vulnerability.

3. High Vulnerability Karstlands. The high vulnerability karst lands are those areas where resource damage threats associated with land management activities are appreciably greater than those posed by similar activities on low or moderate vulnerability karst lands. These areas shall be managed to insure conservation of karst values through the implementation of a high level of protection. Timber management and related activities should be excluded from these lands. Limited recreational development may be appropriate. Recreational facilities and trails would have to consider karst resource values and objectives discussed above, particularly with respect to reducing disturbance of significant epikarst features and sensitive soils and use of construction methods that avoid erosion and diversion of natural drainage waters into karst features. Roads are considered inappropriate with the following exception if no other route or option is available. Small expanses of these areas may be crossed by roads to access areas where harvest is appropriate, i.e. low or moderate vulnerability karst lands and non-carbonate areas. If roads must be built across areas of high vulnerability the following guidelines apply. See Appendix H for additional guidance. Karst lands found to be of high vulnerability shall be identified and removed from the commercial forestlands suitable land base.

    a) Minimize clearing limits and grubbing. Flush cut stumps to the ground. Do not deck logs pioneered from the road clearing limits outside the clearing limits.

    b) Use a fill-type construction rather than a balanced cut and fill design. This most likely will be possible since the slope gradient of these areas are generally >15%.

    c) Utilize log stringer bridges or similar structures to span across collapse features if necessary. Geotextile should be used to keep aggregate overlay from falling into the collapse feature.

    d) Sediment traps and erosion control measures will be needed in most cases.

    e) Same-season re-vegetation of the cut and fill slopes should be required to minimize sediment production potential.

    f) A "plan-in-hand" review by the karst management specialist of the proposed road construction prior to actual construction is required.

g) The karst management specialist needs to work closely with engineering to carefully design these roads coordinating efforts with the planning team.

h) No quarry development would be allowed on these lands.

Heritage Resources

All units comply with required Forest Plan Heritage Standards and Guidelines. Section 106 process were not concluded with the signing of the ROD, therefore, Heritage Professionals followed the guidelines set forth in FSM 2363 and FSH 2309.12 Chapter 30 to identify, evaluate, and allocate Heritage resources to a management category. The direction contained within FSH 2309.12 Chapter 30 applies to all POW LLA activities regardless of whether they are conducted under Section 106 or Section 110 (§ 306101-306107 and 306109 306114) of the National Historic Preservation Act (NHPA), or Archaeological Resources Protection Act (ARPA) (16 USC 470aa et seq.) or other authorities. Appropriate identification and evaluation research was carried out to the degree required to make decisions regarding the historic properties that may be affected by the proposed Twin Mountain Timber Sale. Known Heritage resources identified within a unit's area of potential effect (APE) were evaluated for the National Register of Historic Places (NRHP) or were not evaluated but treated as eligible per FSM 2363.22 and the provisions at Section II.c. Evaluation of Historic Properties. Heritage resource information is proprietary and is protected under provisions of the NHPA and ARPA and as such, it is not shown on unit card maps. The layout crew was given information on which areas to buffer so as to avoid inadvertently disturbing Heritage resources.

Soils/Wetlands

Unit design and road locations are heavily influenced by the project area's soil resources. For instance, factors such as RMA buffers protect riparian soils and efforts to avoid slopes greater than 72 percent often determine the location of unit boundaries, temporary roads, and landings.

Factors that can influence unit design are areas designated as unsuitable for harvest due to very high landslide potential, colluvial activity, MMI4 soils, slopes steeper than 72 percent, and unstable drainages. Slopes greater than 72 percent that remain within units have been determined to be suitable for harvest with a minimum of partial suspension or full suspension yarding. These factors that influence unit design and define whether slopes greater than 72 percent are suitable for harvest are addressed in the unit cards.

Temporary roads crossing wetlands are noted in the unit cards. All road construction planned for this project is for silvicultural purposes and will be located and designed to meet 33 CFR 323 guidelines and State-approved BMPs.

Shovel yarding should follow BMPs 12.5, 13.2 and 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4. Specifically, shovel operators should avoid non-forested areas to prevent rutting. Slopes over 25 percent gradient may not be suitable for shovel yarding under some soil moisture conditions. Use care when approving shovel yarding on slopes over 25 percent gradient. Avoid track slippage and rutting.

All units have a minimum of partial suspension required unless otherwise stated within the unit card text. Some units have areas where full suspension is required. Consult the unit card text for details on locations (BMP 13.9).

Wildlife

All units comply with required Forest Plan Wildlife Standards and Guidelines. Any nests/animal dens discovered at any time will receive the necessary standard and guideline applications. See the description of legacy forest structure and direction in the General Direction Regarding the Implementation of the Legacy Forest Structure Standard and Guideline above and in the Forest Plan p. 4-86 and 87.

Wolves: The Forest Plan requires a 1,200-foot buffer be applied to all known wolf den sites in the project area (Forest Plan p. 4-91). Where known den site buffers overlapped proposed harvest units; the portions of units overlapping the buffers are removed from the unit pool. Actual den locations and buffers are not displayed on unit cards maps at the request of the Alaska Department of Fish and Game (ADF&G).

Black bears: The Forest Plan does not require buffers for black bear dens. Black bear den sites will be protected under the Forest Plan standard and guideline for snag and cavity nesting habitat (Forest Plan p. 4-87). Black bear dens are frequently in snags or cavities in trees and can be protected under this standard and guideline. Actual den locations and buffers are not displayed on unit card maps at the request of ADF&G.

Goshawks: The Forest Plan requires a 100-acre buffer on all known active goshawk nests. This buffer will be applied to all active and probable goshawk nest sites (Forest Plan p. 4-95).

Sitka black-tailed deer: Uneven-aged harvest and commercial thinning will help maintain or enhance black-tailed deer habitat over the long-term. Reduction of habitat, especially winter habitat, and fragmentation were also an important component of maintaining deer habitat. Where practical, corridors are planned to facilitate movement of deer across the landscape (Forest Plan p. 4-88).

Various treatments, including thinning, girdling, pruning, and slash treatments, may be used to improve wildlife habitat in young-growth stands. Treatments will be prioritized in deep snow winter habitat (south-facing stands below 800 feet in elevation) when consistent with stand objectives and desired future conditions. That is, as funding becomes available, deep snow habitat areas (especially in wildlife analysis areas (WAAs) with deep snow habitat concerns) would receive priority consideration for treatments, but the treatments would be consistent with stand objectives and desired future conditions.

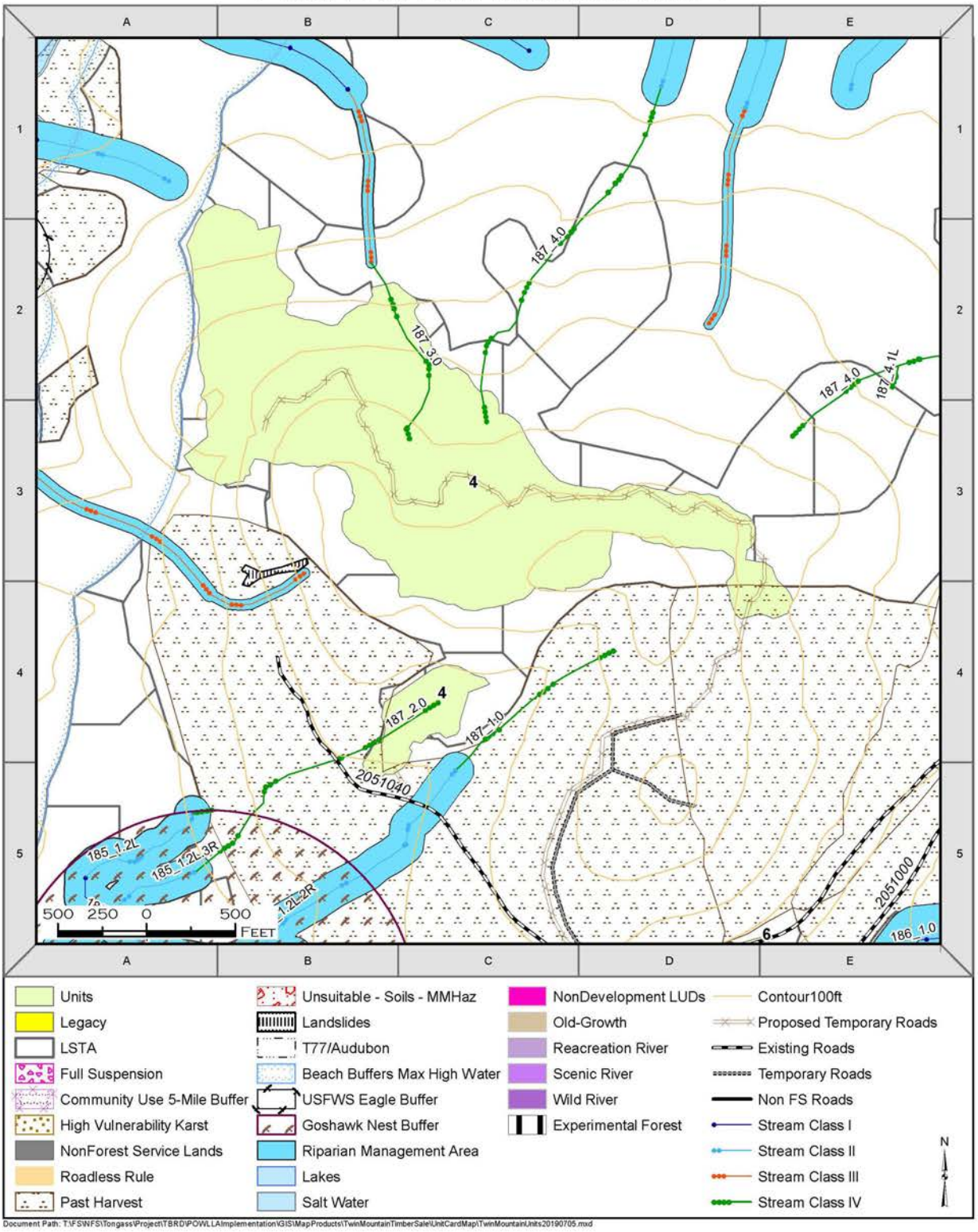
Bald Eagle: All laws and regulations regarding bald eagles will be followed (Forest Plan p. 4-88).

Heron and Raptor: Protect active rookeries and raptor nests. Active nests will be protected with a forested 600-foot windfirm buffer, where available. Road construction through the buffer is discouraged. Prevent disturbance during the active nesting season (generally March 1 to July 31) (Forest Plan p. 4-90).

Marbled Murrelet: If nests are found during project implementation, maintain a 600-foot, generally circular, radius of undisturbed forest habitat surrounding identified murrelet nests, where available. Minimize disturbance activities within this buffer during the nesting season (May 1 to August 15). Maintain the buffer zone and monitor the site for nesting activity for not less than two nesting seasons after nest discovery. Maintain the buffer if the nest site is active during the monitoring period. Buffer protection may be removed if the site remains inactive for two consecutive nesting seasons (Forest Plan p. 4-92).

Marine Mammals: Ensure that Forest Service authorized or approved activities are conducted in a manner consistent with the Marine Mammal Protection Act, Endangered Species Act, and National Marine Fisheries Service guidelines (Forest Plan p. 4-89).

POW LLA Twin Mountain Unit 4



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Unit 4							
Unit Number:	4	**Total Harvest Unit Acres**	73.7	**Prescription:**	EA	**Harvest System:**	Shovel, Cable
VCU Number:	5890	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		1,652

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock with a strong component of redcedar in the overstory, but also contain lesser amounts of spruce and yellow-cedar. Stand structure is complex with small infrequent breaks in the canopy from overstory mortality and variable soil drainage. Tree sizes cover a wide range and stocking ranges from moderate-to-well stocked. Snags are common throughout and fairly well-distributed. The understory layer is moderately brushy, mainly blueberry, but has a strong component of rusty menziesia, and is unevenly distributed. Forbs commonly found in old-growth are distributed throughout. This stand is mature with heavy stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections are moderate and some insect damage has been noted in the overstory. The risk for windthrow in this stand is high due to its exposure to westerly winds coming off Warm Chuck Inlet, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. No concerns were identified in this unit that would require a review for a RAW buffer.

TIMBER/LOGGING

This unit is planned for shovel and uphill cable yarding to landings along two proposed temporary roads off of NFSR 2051040.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2051040 (BMP 14.20, Road-4, Road-6). New temporary road on existing prism 0.37 miles. (BMPs 14.5, Road-3, Road-6). New temporary road construction, 1.01 miles (BMPs 14.5, Road-3, Road-5, Road-6).

BOTANY

No botany concerns.

INVASIVE SPECIES

No weeds are known from this area. To keep this area weed-free follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest. Specifically follow recommendations under Activity Cards 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, inspect all borrow pits before use and transport of rock to the units or new roads.

FISHERIES

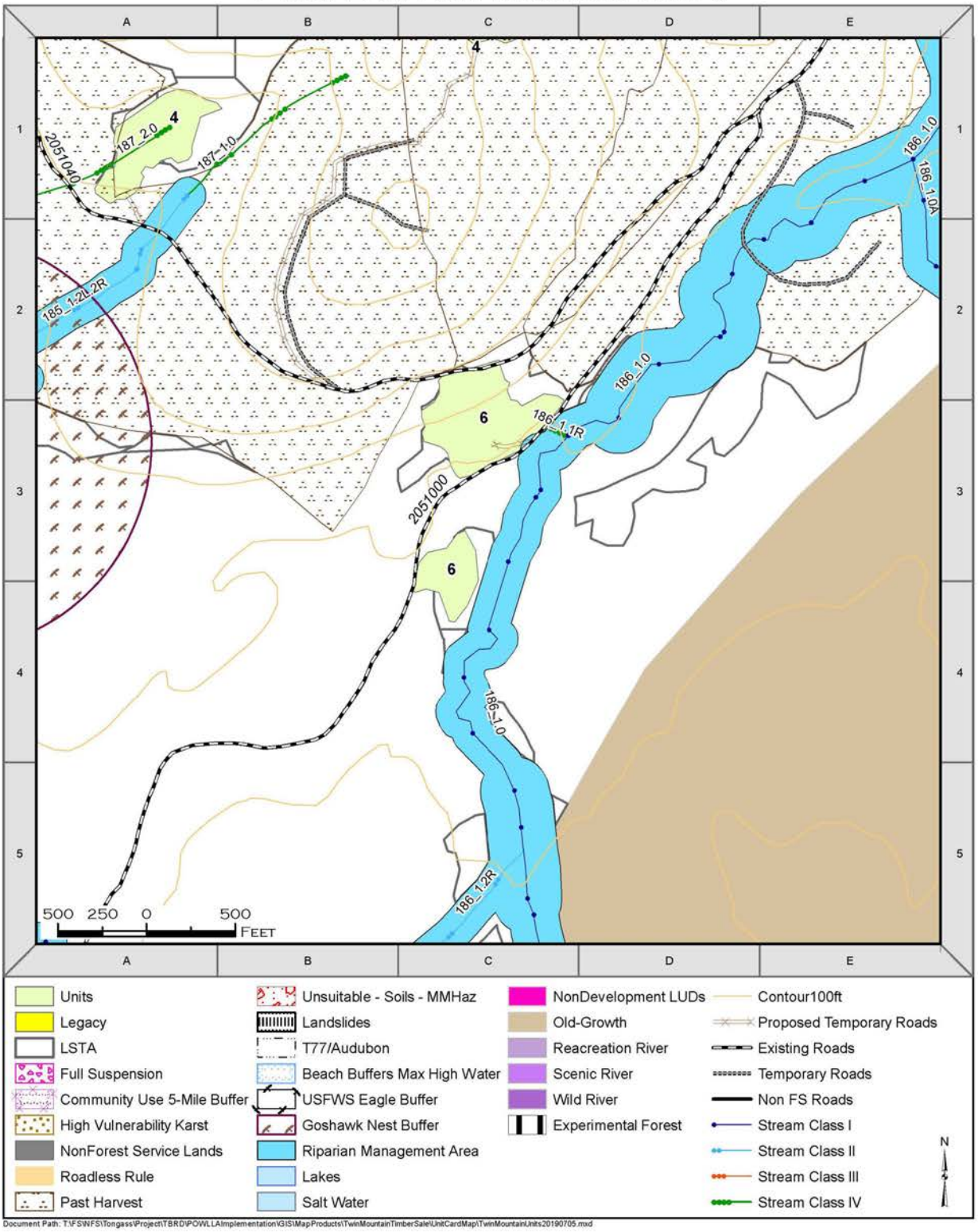
Stream Num.: 187_1.0
Stream Class: II, IV
Channel Type: HCO
Protection: Category A and C
Flagging: B/W, G/W
Buffer (RMA):
Class II for HCO: 100 feet or to the top of the side-slope break; whichever is greater
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 187_2.0
Stream Class: IV
Channel Type: HCO

Unit 4
Protection: Category C Flagging: G/W Buffer (RMA): Class IV for HCO: No buffer Concerns: N/A Stream Num.: 187_3.0 Stream Class: III, IV Channel Type: HCM, HCO Protection: Category B and C Flagging: O/W, G/W Buffer (RMA): Class III for HCM: To the top of the side-slope break Class IV for HCO: No buffer Concerns: N/A Stream Num.: 187_4.0 Stream Class: IV Channel Type: HCO Protection: Category C Flagging: G/W Buffer (RMA): Class IV for HCO: No buffer Concerns: N/A
All Streams Protection/Mitigation Actions by Category: All Categories implement BMPs Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers. Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
A new crossing for an unmapped Class IV stream is planned for reconditioned NFS road 2051040. Nine culverts have been specified for reconstructed temporary road and temporary road to provide drainage for non-streams and Class IV streams. No temporary road crossing locations specified, assume most will be within unit. Should temporary road locations be changed such that different streams would be crossed, structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3, 14.5 and AqEco-4.
GEOLOGY/KARST
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.

Unit 4
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes are mostly gentle with short steep pitches greater than 72% scattered in the unit in the northern polygon. In the southern polygon, slopes are gentle throughout. All slopes are suitable for harvest with shovel yarding and partial suspension cable yarding (R10 BMP 13.9 and National Core BMPs Plan-2, Veg-2, Veg-4, Veg-5, and Veg-6). Shovel yarding on gentler slopes should follow R10 BMPs 12.5, 13.2 and 13.9 and National Core BMPs Plan-2, Veg-2, Veg-4, Veg-5, and Veg-6 and shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMP 13.9 and National Core Veg-4). Forested wetland is present on the boundary fringes of the unit in the northern polygon and located throughout in the southern polygon. The proposed temporary road in the northern polygon traverses about ½ acre of forested wetland in the unit and about ¼ acre outside of the unit. The temporary road in the southern polygon does not cross any wetland. Wetland avoidance was not feasible due to the location of the existing road, engineering constraints with steep slopes, and the location of wetlands outside the unit. Follow R10 BMPs12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 6



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Unit 6							
Unit Number:	6	**Total Harvest Unit Acres**	9.4	**Prescription:**	EA	**Harvest System:**	Shovel
VCU Number:	5890	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		210

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock in the overstory with lesser amounts of spruce and cedar irregularly distributed throughout. Stand structure is variable, containing breaks in the canopy from tree mortality and windthrow where a variety of trees sizes are found, but also has areas of continuous canopy cover where overstory trees are well-stocked. Trees range in size from small seedlings to large diameter dominant overstory individuals. Snags and downed wood are distributed throughout. The understory is predominantly blueberry with lesser amounts of rusty menziesia and red huckleberry. Forbs commonly found in old-growth are distributed throughout but in varied densities. This stand is mature with light to moderate stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections in the overstory are light. The risk for windthrow in this stand is moderate due to its exposure to westerly winds coming off Warm Chuck Inlet, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. No concerns were identified in this unit that would require a review for a RAW buffer.

TIMBER/LOGGING

This unit is planned for shovel yarding to a landings on NFS road 2051000 and landings on a temporary road off of the 2051000 road.

ENGINEERING/SYSTEM ROADS

Access via existing NFS roads 2051000 and 2051040 (BMP 14.20, Road-4, Road-6) and new temporary road construction, 0.05 miles (BMPs 14.5, Road-3, Road-5, Road-6).

BOTANY

No botany concerns.

INVASIVE SPECIES

Weeds are in the area of the unit along NFSR 2051000. Follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest, but specifically in 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, to reduce the risk of further introduction, inspect all borrow pits before use and transport of rock to the units or new roads. See Krosse 2017 for all BMP's.

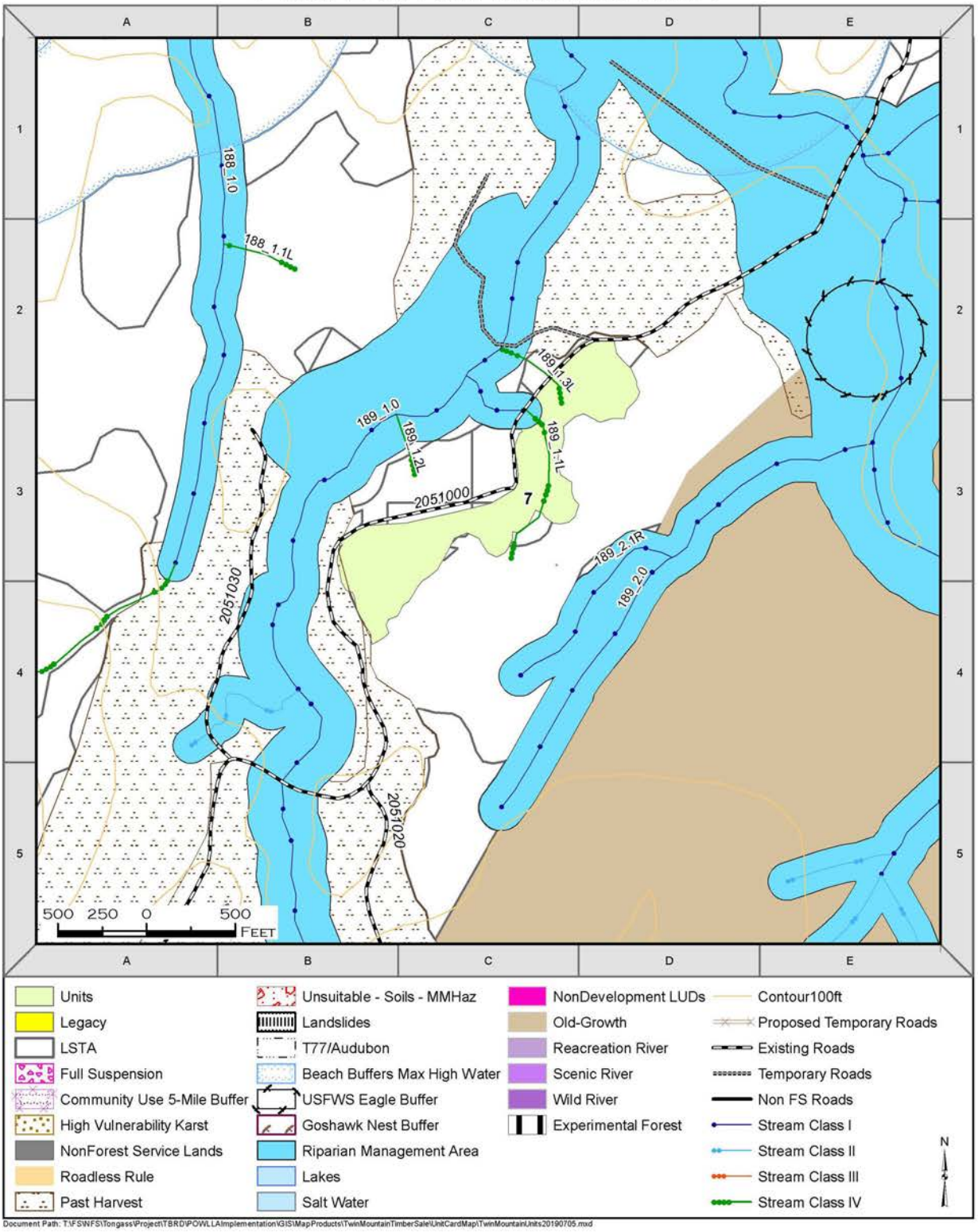
FISHERIES

Stream Num.: 186_1.0
Stream Class: I
Channel Type: MCM, PAB
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class I for MCM: 100 feet or to the top of the side-slope break; whichever is greater
Class I for PAB: 100 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater
Concerns: N/A

Stream Num.: 186_1.1R
Stream Class: IV
Channel Type: MMO

Unit 6
Protection: Category C Flagging: G/W Buffer (RMA): Class IV for MMO: No buffer Concerns: N/A
All Streams Protection/Mitigation Actions by Category: All Categories implement BMPs Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers. Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
One remove/replace of cross drain on the reconstructed 2051040. No specified or anticipated temporary road crossings. Should temporary road/stream crossings be needed, crossing structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3, 14.5 and AqEco-4.
GEOLOGY/KARST
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes are gentle in the eastern boundary and up to 80% along the western boundary in the northern polygon. The southern polygon has gentle slopes less than 25%. All slopes in both polygons are suitable for shovel yarding. Shovel yarding on gentler slopes should follow R10 BMPs 12.5, 13.2 and 13.9 and National Core BMPs Plan-2, Veg-2, Veg-4, Veg-5, and Veg-6. Follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMP 13.9 and National Core Veg-4). Forested wetlands/emergent short sedge are intermixed throughout the southern polygon of the unit (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4).
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 7



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Unit 7							
Unit Number:	7	**Total Harvest Unit Acres**	16.6	**Prescription:**	EA	**Harvest System:**	Shovel
VCU Number:	5890	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		372

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are not defined by a single dominant overstory species, but rather by a mixture of many species. This stand predominantly contains western hemlock, redcedar, and yellow-cedar in varying degrees and densities. Spruce, mountain hemlock, and shorepine are also found but at low densities and infrequently. The stand structure is complex and the canopy is fairly broken throughout and due mainly to poor soil drainage but also tree mortality. Overstory trees vary in size but are smaller in diameter than other forest types, and moderately-to-poorly stocked. Snags and downed wood are common throughout. The understory is heavy throughout because of breaks in the canopy and contains a variety of well-distributed shrubs and forbs. This stand is mature with light to moderate stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections are light and some insect damage has been noted in the overstory. The risk for windthrow in this stand is moderate due to its exposure to westerly winds coming off Warm Chuck Inlet, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. A RAW buffer along the Class I stream to the west of this unit has been prescribed, from the stream buffer to the road.

TIMBER/LOGGING

This unit is planned for shovel yarding to landings located along NFSR 2051000.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2051000 (BMP 14.20, Road-4, Road-6).

BOTANY

No botany concerns.

INVASIVE SPECIES

Weeds are in the area of the unit along NFSR 2051000. Follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest, but specifically in 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, to reduce the risk of further introduction, inspect all borrow pits before use and transport of rock to the units or new roads. See Krosse 2017 for all BMP's.

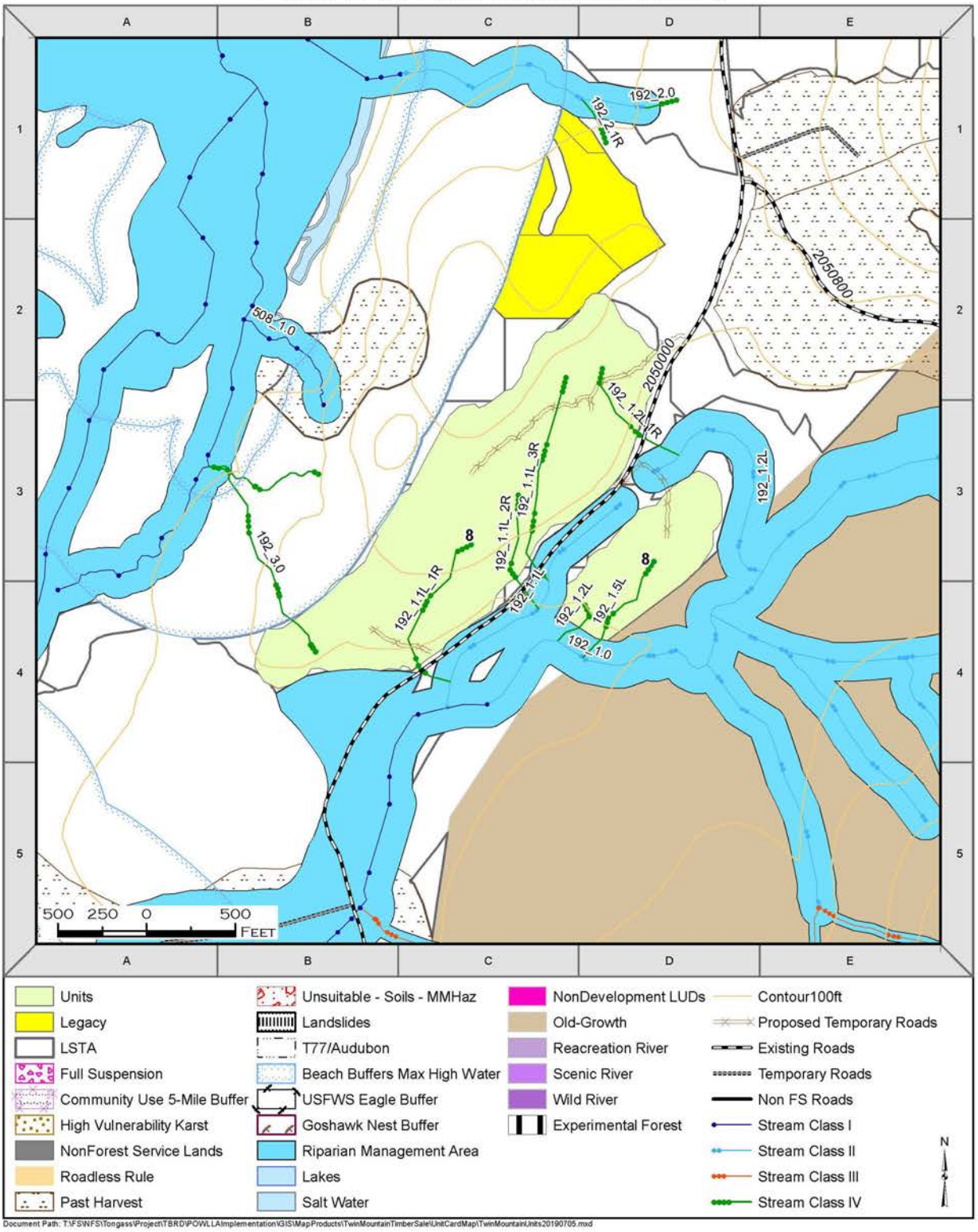
FISHERIES

Stream Num.: 189_1.0
Stream Class: I
Channel Type: MMM
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class I for MMM: 120 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater
Buffer (RAW): Additional buffering for RAW eliminated portion of unit west of 2050000 road
Concerns: N/A

Stream Num.: 189_1.1L
Stream Class: I, IV
Channel Type: HCO, PAO

Unit 7
Protection: Category A and C Flagging: B/W, G/W Buffer (RMA): Class I for HCO: 100 feet or to the top of the side-slope break; whichever is greater Class IV for PAO: No buffer Concerns: N/A Stream Num.: 189_1.3L Stream Class: IV Channel Type: MCO Protection: Category C Flagging: G/W Buffer (RMA): Class IV for MCO: No buffer Concerns: N/A
All Streams Protection/Mitigation Actions by Category: All Categories implement BMPs Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers. Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
No temporary roads planned. Should temporary road/stream crossings be needed, crossing structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3 and 14.5.
GEOLOGY/KARST
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes are less than 25%. The soils are suitable for shovel yarding. Follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMP 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). Forested wetlands occur throughout the unit (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4).
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 8



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Unit 8							
Unit Number:	8	**Total Harvest Unit Acres**	55.1	**Prescription:**	EA	**Harvest System:**	Shovel
VCU Number:	5871, 5890	**LUD:**	**Timber Production**		**Net Harvest Volume (MBF):**		1,234

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock with a strong component of redcedar in the overstory, but also contain lesser amounts of spruce and yellow-cedar. Stand structure is complex with small infrequent breaks in the canopy from overstory mortality and variable soil drainage. Tree sizes cover a wide range and stocking ranges from moderate-to-well stocked. Snags are common throughout and fairly well-distributed. The understory layer is moderately brushy, mainly blueberry, but has a strong component of rusty menziesia, and is unevenly distributed. Forbs commonly found in old-growth are distributed throughout. This stand is mature with moderate to heavy stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections in the overstory are moderate. The risk for windthrow in this stand is high due to its exposure to southwesterly winds coming off Warm Chuck Inlet, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. This unit lies partially within a VCU requiring legacy retention for most even-aged management prescriptions. Because the potential opening of the planned harvest unit (within the legacy VCU) was greater than 20 acres in size, legacy is designated for retention to meet this requirement (Forest Plan, page 4-68). RAW buffers along the Class II streams to the southeast of this unit were initially indicated but were determined to be unnecessary after field review by qualified specialists.

TIMBER/LOGGING

This unit is planned for shovel yarding to landings located on three proposed temporary roads off of NFSR 2050000.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2050000 (BMP 14.20, Road-4, Road-6). New temporary road construction, 0.53 miles (BMPs 14.5, Road-3, Road-5, Road-6).

BOTANY

No botany concerns.

INVASIVE SPECIES

Weeds are in the area of the unit along NFSR 2050000. Follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest, but specifically in 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, to reduce the risk of further introduction, inspect all borrow pits before use and transport of rock to the units or new roads. See Krosse 2017 for all BMP's.

FISHERIES

Stream Num.: 192_1.0
Stream Class: II
Channel Type: MCL
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class II for MCL: 100 feet or to the top of the side-slope break; whichever is greater
Concerns: N/A

Stream Num.: 192_1.1L
Stream Class: II

Unit 8

Channel Type: HCO
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class II for HCO: 100 feet or to the top of the side-slope break; whichever is greater
Concerns: N/A

Stream Num.: 8_1.0
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 8_2.0
Stream Class: IV
Channel Type: HCL
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCL: No buffer
Concerns: N/A

Stream Num.: 8_3.0
Stream Class: IV
Channel Type: HCL
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 192_1.2L
Stream Class: II
Channel Type: PAB
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class II for PAB: 100 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater
Concerns: Temporary road crossing

Stream Num.: 8_4.0
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num: Map Location C-4 (192_1.4L)
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns:

Unit 8

Stream Num.: 192_1.5L
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 192_3.0
Stream Class: IV
Channel Type: MMO, HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for MMO: No buffer
Class IV for HCO: No buffer
Concerns: N/A

All Streams Protection/Mitigation Actions by Category:
All Categories implement BMPs
Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers.

Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers.

Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.

ROAD/STREAM CROSSING SUMMARY

Three segments of temporary road are proposed for this unit. The segment to the east of the 2050000 road has one Class II crossing outside of the timber unit that will require Title 16 concurrence with the state. The road segments west of the 2050000 have 7 Class IV and non-stream crossings. If any additional stream crossings are found, crossing structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3, 14.5 and AqEco-4.

GEOLOGY/KARST

Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.

HERITAGE RESOURCES

A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.

SCENERY

No scenery concerns.

RECREATION

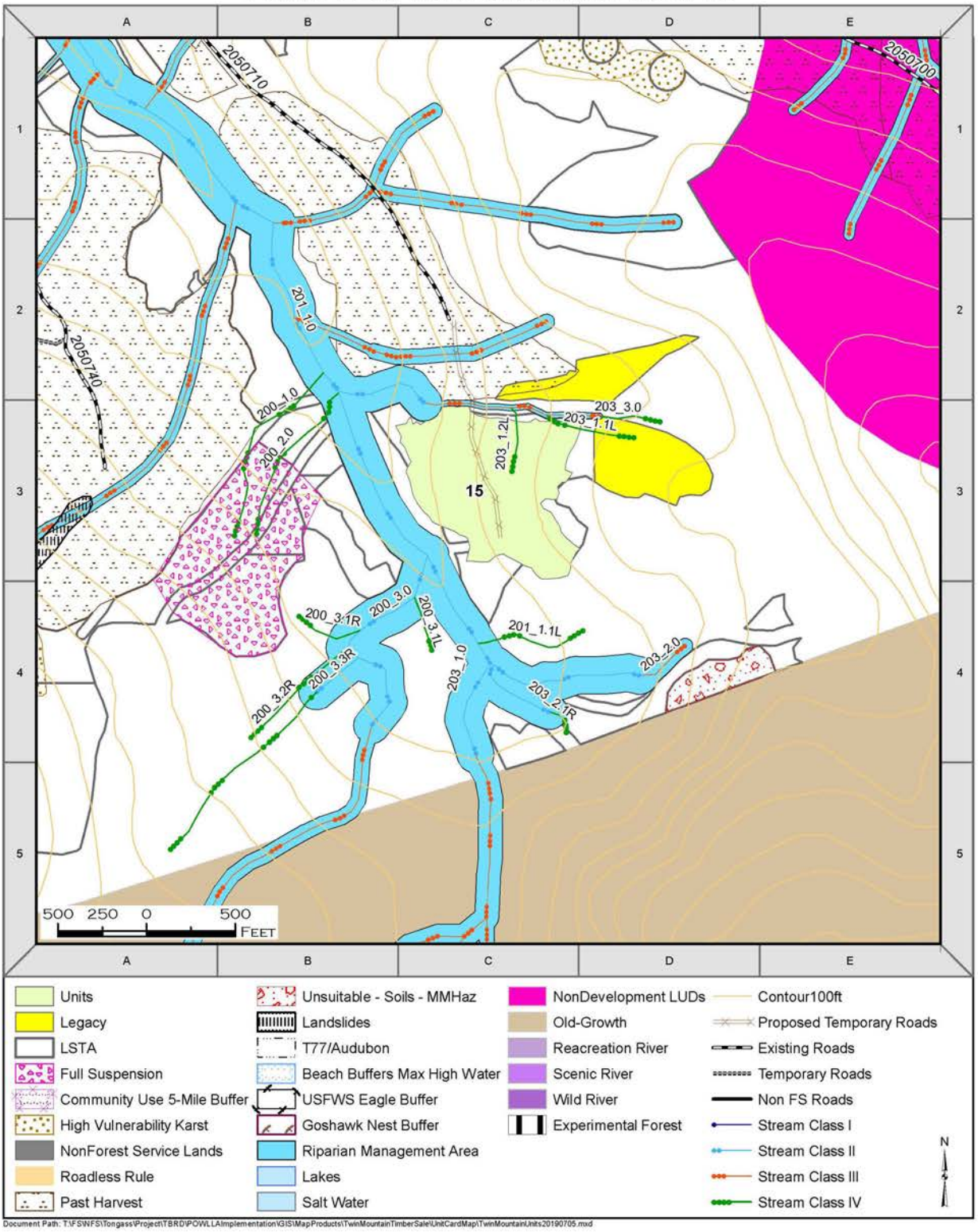
No recreation concerns.

SOILS/WETLANDS

Slopes are less than 35% in both polygons. The soils are suitable for shovel yarding. Follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMP 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). The proposed northern temporary road in the western polygon traverses about 0.1 acres of forested wetland within the unit and about 0.25 acres of forested wetland outside of the unit. The

Unit 8
proposed temporary road into the eastern polygon crosses about 0.1 acres of moss muskeg outside of the unit boundary. Wetland avoidance was not feasible due to the location of the existing road and the location of wetlands surrounding the unit polygons. Follow R10 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 15



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Unit 15							
Unit Number:	15	**Total Harvest Unit Acres**	15.5	**Prescription:**	EA	**Harvest System:**	Cable
VCU Number:	5871	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		347

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock with a strong component of yellow-cedar in the overstory, but also contains lesser amounts of spruce and redcedar. Stand structure is complex with breaks throughout the canopy from overstory mortality and variable soil drainage. Tree sizes cover a wide range and stocking ranges from moderate-to-well stocked. Yellow-cedar snags are common throughout, with lesser amounts of snags of different species. The understory layer is brushy, mainly blueberry but has a strong component of rusty menziesia, and is more evenly distributed throughout because of breaks in the canopy. Forbs commonly found in old-growth are distributed throughout. This stand is mature with light to moderate stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections were not noted in the overstory. The risk for windthrow in this stand is moderate due to its exposure to southeasterly winds, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. Because the potential opening of the planned harvest unit was greater than 20 acres in size, legacy is designated for retention to meet this requirement (Forest Plan, page 4-68). A RAW buffer along the Class III stream to the north of this unit has been prescribed.

TIMBER/LOGGING

This unit is planned for uphill, and downhill cable yarding to landings located along proposed temporary road off of NFSR 2050710. The proposed temporary road will enter the unit from the north.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2050710 (BMP 14.20, Road-4, Road-6). New temporary road construction, 0.24 miles (BMPs 14.5, Road-3, Road-5, Road-6).

BOTANY

No botany concerns.

INVASIVE SPECIES

No weeds are known from this area. To keep this area weed-free follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest. Specifically follow recommendations under Activity Cards 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, inspect all borrow pits before use and transport of rock to the units or new roads.

FISHERIES

Stream Num: 200_3.0
Stream Class: II
Channel Type: HCV
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class II for HCV: 100 feet or to the top of the side-slope break; whichever is greater
Concerns: N/A

Stream Num.: 201_1.0
Stream Class: II

Unit 15

Channel Type: HCD
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class II for HCD: 100 feet or to the top of the side-slope break; whichever is greater
Concerns: N/A

Stream Num.: 203_3.0
Stream Class: II, III, IV
Channel Type: HCO
Protection: Category A, B, and C
Flagging: B/W, O/W, G/W
Buffer (RMA):
Class II for HCO: 100 feet or to the top of the side-slope break; whichever is greater
Class III for HCO: To the top of the side slope break
Class IV for HCO: No buffer
Concerns: RAW buffering for the Class III portion of this stream is needed, and is laid out on the ground.

Stream Num.: 203_1.1L
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 203_1.2L
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

All Streams Protection/Mitigation Actions by Category:
All Categories implement BMPs
Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers.

Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers.

Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.

ROAD/STREAM CROSSING SUMMARY

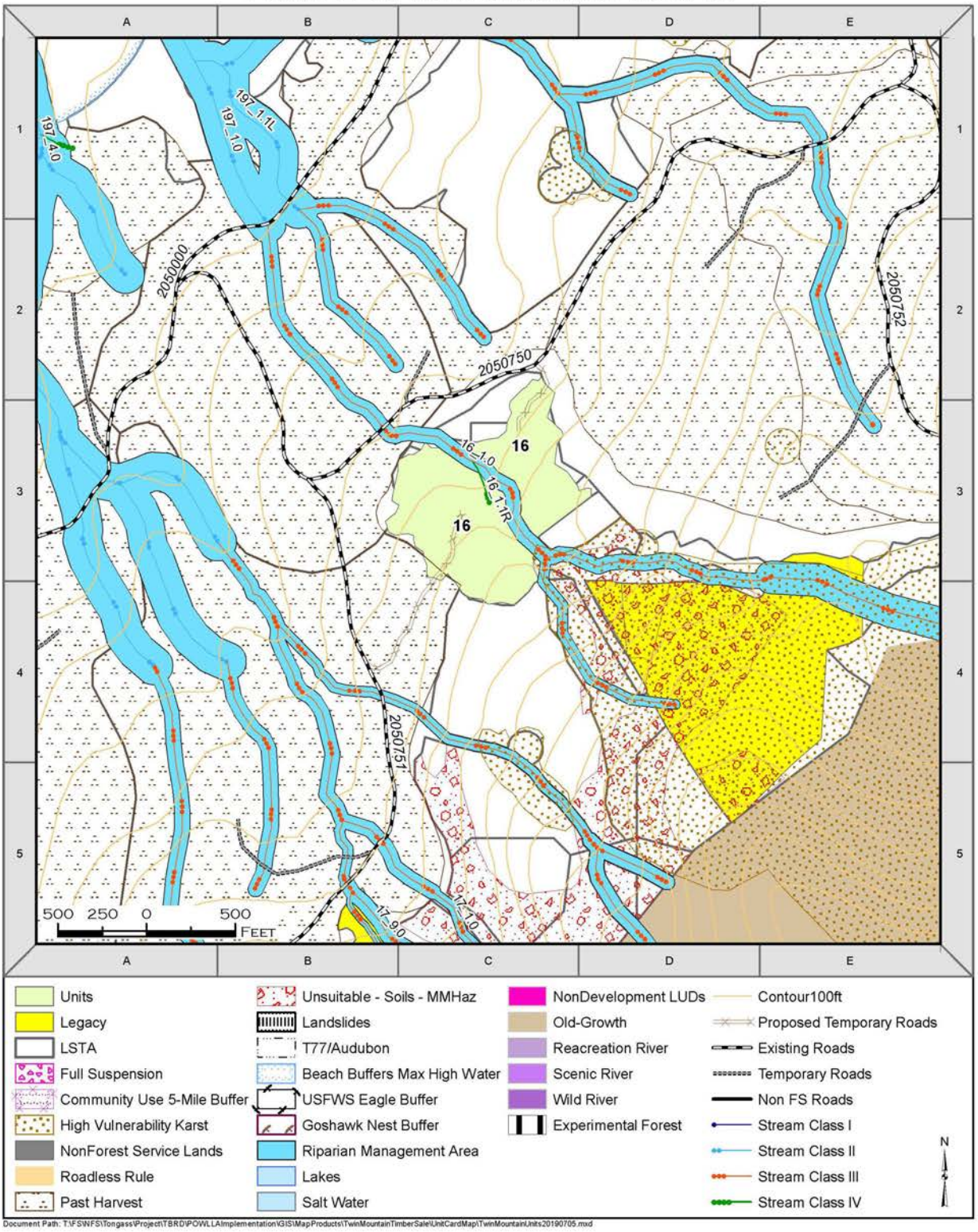
One replacement of a cross drain on the reconstructed 2050710 road. Two Class III crossings planned on temporary road, one is within the unit (over Stream Num. 203_3.0), and one is outside of unit. Should temporary road locations be changed such that different streams would be crossed, structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3, 14.5 and Aq-Eco-4.

GEOLOGY/KARST

Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.

Unit 15
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Small rocky outcrops over 72% were observed in portions of the unit. All remaining slopes are less than 55%. All slopes within the unit are suitable for a minimum of partial suspension cable yarding. Follow R10 BMPs 12.5, 13.2 and 13.9 and National Core BMPs Plan-2, Veg-2, Veg-4, Veg-5, and Veg-6. . Follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMPs 12.5 and 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). Skunk cabbage drainages in the western 1/3 of the unit were observed in the unit (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4). The proposed temporary road does not traverse any wetland. Follow R10 BMPs12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 16



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Unit 16							
Unit Number:	16	**Total Harvest Unit Acres**	17	**Prescription:**	EA	**Harvest System:**	Shovel
VCU Number:	5871	**LUD:**	**Timber Production**		**Net Harvest Volume (MBF):**		381

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock in the overstory with lesser amounts of spruce and cedar irregularly distributed throughout. Stand structure is variable, containing breaks in the canopy from tree mortality and windthrow where a variety of trees sizes are found, but also has areas of continuous canopy cover where overstory trees are well-stocked. Trees range in size from small seedlings to large diameter dominant overstory individuals. Snags and downed wood are distributed throughout. The understory is predominantly blueberry with lesser amounts of rusty menziesia and red huckleberry. Forbs commonly found in old-growth are distributed throughout but in varied densities. This stand is mature with moderate to heavy stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections in the overstory are light. The risk for windthrow in this stand is moderate due to its exposure to southeasterly winds, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. Because the potential opening of the planned harvest unit was greater than 20 acres in size, legacy is designated for retention to meet this requirement (Forest Plan, page 4-68). A RAW buffer along the Class III stream within this unit was initially indicated but was determined to be unnecessary after field review by qualified specialists.

TIMBER/LOGGING

This unit is planned for shovel yarding to landings located along a proposed temporary road off of NFSR 2050750. The proposed temporary road will enter the unit from the north.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2050750 (BMP 14.20, Road-4, Road-6). New temporary road construction, 0.30 miles (BMPs 14.5, Road-3, Road-5, Road-6).

BOTANY

No botany concerns.

INVASIVE SPECIES

No weeds are known from this area. To keep this area weed-free follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest. Specifically follow recommendations under Activity Cards 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, inspect all borrow pits before use and transport of rock to the units or new roads.

FISHERIES

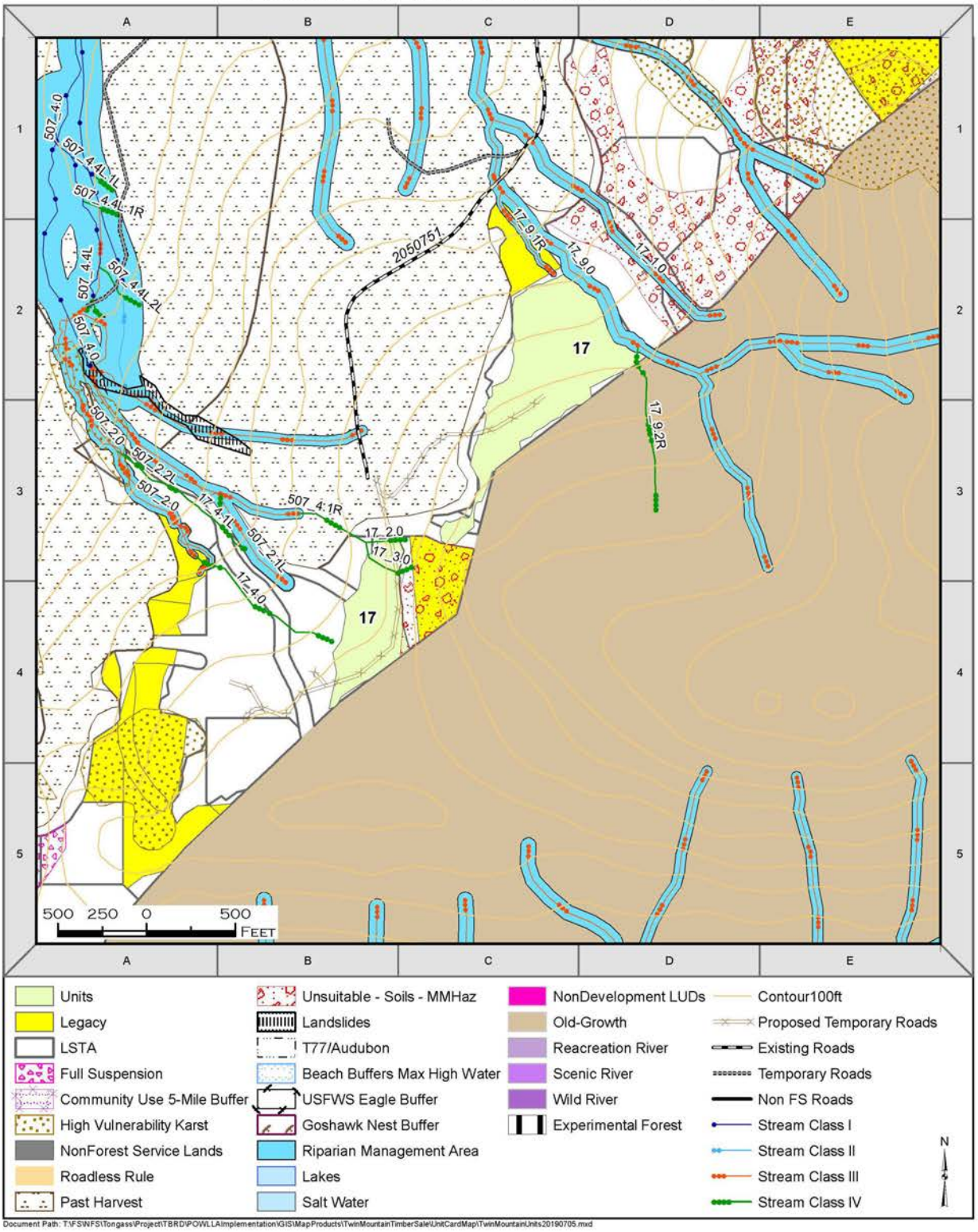
Stream Num.: 16_1.0
Stream Class: III
Channel Type: HCD
Protection: Category B
Flagging: O/W
Buffer (RMA):
Class III for HCD: To the top of the side slope break
Concerns: N/A

Stream Num.: 16_1.1R
Stream Class: IV

Unit 16
Channel Type: HCO Protection: Category C Flagging: G/W Buffer (RMA): Class IV for HCO: No buffer Concerns: N/A Stream Num.: Map Location B-3 / C-3 (16_2.0) Stream Class: IV Channel Type: HCO Protection: Category C Flagging: G/W Buffer (RMA): Class IV for HCO: No buffer Concerns: N/A Stream Num.: Map Location C-4 / D-4 (16_1.2R) Stream Class: IV Channel Type: HCO Protection: Category C Flagging: G/W Buffer (RMA): Class IV for HCO (currently mapped as Class III): No buffer Concerns: N/A
All Streams Protection/Mitigation Actions by Category: All Categories implement BMPs Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers. Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
Two temporary road crossings anticipated for non-stream or Class IV streams outside of the unit. Should temporary road locations be changed such that different streams would be crossed, structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3, 14.5 and AqEco-4.
GEOLOGY/KARST
Unit has been reviewed for karst and cave resources. The western most setting is on moderate vulnerability karst. The higher elevations of the unit come against high vulnerability karst as laid out. No high vulnerability karst is within the unit, legacy as laid out protects the high vulnerability karst in the upper portions of the unit and stream course. A harvest method that obtains partial suspension is required on the moderate vulnerability karst.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.

Unit 16
SOILS/WETLANDS
Slopes range from gentle to greater than 72%. About an acre of small rock outcrops 150 ft in length were observed in the unit. Approximately 50 acres were excluded from harvest consideration due to very steep cliffs and surface colluvial activity. All slopes within the unit boundary are suitable for a shovel yarding. (R10 BMPS 12.5, 13.5, and 13.9 and National Core BMPs Plan-2, AqEco-2, AqEco-4, Veg-1, Veg-2, and Veg-4). Follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMPs 12.5 and 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). Forested wetland is present on the gentle slopes (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4). The northern temporary road traverses about a ½ acre of forested wetland. Wetland avoidance was not feasible due to the location of the existing road, engineering constrains with steep ground, and wetland abundance. Follow R10 BMPs12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 17



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Unit 17							
Unit Number:	17	**Total Harvest Unit Acres**	17.8	**Prescription:**	EA	**Harvest System:**	Shovel
VCU Number:	5871	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		399

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock in the overstory with lesser amounts of spruce and cedar irregularly distributed throughout. Stand structure is variable, containing breaks in the canopy from tree mortality and windthrow where a variety of trees sizes are found, but also has areas of continuous canopy cover where overstory trees are well-stocked. Trees range in size from small seedlings to large diameter dominant overstory individuals. Snags and downed wood are distributed throughout. The understory is predominantly blueberry with lesser amounts of rusty menziesia and red huckleberry. Forbs commonly found in old-growth are distributed throughout but in varied densities. This stand is mature with light to moderate stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections in the overstory are heavy. The risk for windthrow in this stand is high due to its exposure to southeasterly winds, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. Because the potential opening of the planned harvest unit was greater than 20 acres in size, legacy is designated for retention to meet this requirement (Forest Plan, page 4-68). RAW buffers along the Class III streams within this unit were initially indicated but were determined to be unnecessary after field review by qualified specialists.

TIMBER/LOGGING

This unit is planned for shovel yarding to landings located along two proposed temporary roads off of NFSR 2050751.

ENGINEERING/SYSTEM ROADS

Access via existing NFS roads 2050751 (BMP 14.20, Road-4, Road-6). New temporary road construction, 0.46 miles (BMPs 14.5, Road-3, Road-5, Road-6).

BOTANY

No botany concerns.

INVASIVE SPECIES

Weeds are in the area of the unit. Follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest, but specifically in 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, to reduce the risk of further introduction, inspect all borrow pits before use and transport of rock to the units or new roads. See Krosse 2017 for all BMP's.

FISHERIES

Stream Num.: 17_2.0
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Unit 17

Stream Num.: 17_3.0
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 17_4.0
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 17_9.0
Stream Class: III
Channel Type: HCD, HCM
Protection: Category B
Flagging: O/W
Buffer (RMA):
Class III for HCD: To the top of the side-slope break
Class III for HCM: To the top of the side-slope break
Concerns: N/A

Stream Num.: 17_9.1R
Stream Class: III
Channel Type: HCO
Protection: Category B
Flagging: O/W
Buffer (RMA):
Class III for HCO: To the top of the side-slope break
Concerns: N/A

Stream Num.: 17_9.2R
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

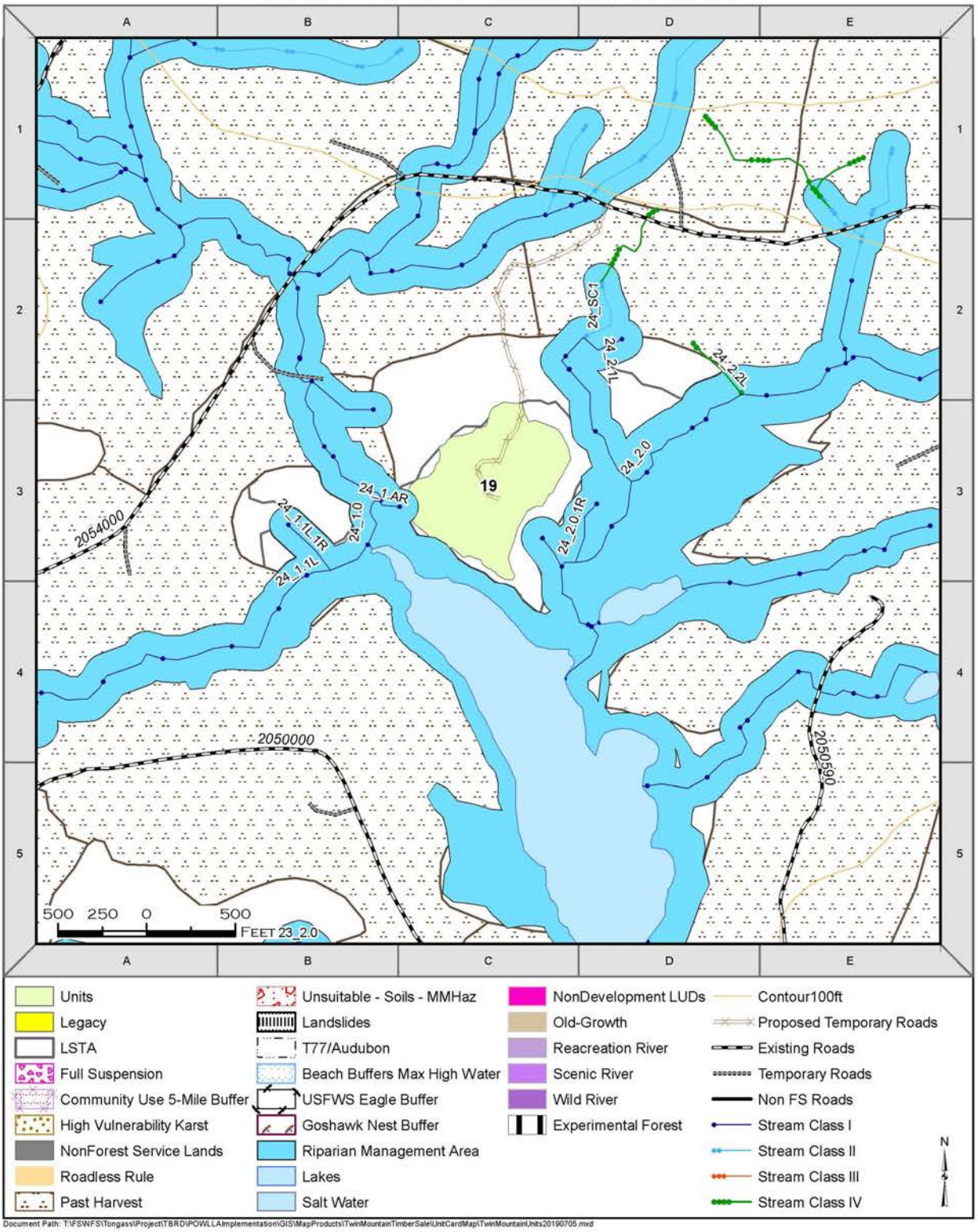
All Streams Protection/Mitigation Actions by Category:
All Categories implement BMPs
Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers.

Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers.

Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.

Unit 17
ROAD/STREAM CROSSING SUMMARY
Eight culvert re-installations are planned for NFS road 2050751 with one Class III crossing, and the remaining crossings are for unmapped class IV streams, non-streams, or cross drains. There are four crossings planned on temporary roads for Class IV and non-streams, four are within the unit. Should temporary road locations be changed such that different streams would be crossed, structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3, 14.5 and AqEco-4.
GEOLOGY/KARST
Unit has been reviewed for karst and cave resources. Most of the unit is underlain by moderate vulnerability karst with inclusions of high vulnerability surrounding discrete karst features. A no harvest buffer has been flagged surrounding these karst features, the unit as laid out reflects this area. A harvest method that obtains partial suspension is required on the moderate vulnerability karst.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes range from 30-60%. All slopes over 72% are excluded from harvest. Approximately 4 acres were excluded due to very steep cliffs, surface colluvial activity, and landslide prone soils. All slopes within the unit boundary are suitable for a minimum of partial suspension cable yarding and shovel yarding (R10 BMPS 12.5, 13.5, and 13.9 and National Core BMPs Plan-2, AqEco-2, AqEco-4, Veg-1, Veg-2, Veg-5, and Veg-6). Follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMPs 12.5 and 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). Forested wetland is present on the gentle slopes (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4). The proposed temporary roads do not traverse any wetland. Follow R10 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected. The unit is adjacent to OGR. Marbled murrelet sub-canopy behavior detected in unit in 2019 received a 600 foot windfirm buffer.

POW LLA Twin Mountain Unit 19



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Unit 19							
Unit Number:	19	**Total Harvest Unit Acres**	12	**Prescription:**	EA	**Harvest System:**	Shovel
VCU Number:	5880	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		269

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock in the overstory with lesser amounts of spruce and cedar irregularly distributed throughout. Stand structure is variable, containing breaks in the canopy from tree mortality and windthrow where a variety of trees sizes are found, but also has areas of continuous canopy cover where overstory trees are well-stocked. Trees range in size from small seedlings to large diameter dominant overstory individuals. Snags and downed wood are distributed throughout. The understory is predominantly blueberry with lesser amounts of rusty menziesia and red huckleberry. Forbs commonly found in old-growth are distributed throughout but in varied densities. This stand is mature with light to moderate stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections in the overstory are light. The risk for windthrow in this stand is moderate due to its exposure to winds coming off adjacent lakes and muskegs to the south and east, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. However, the potential opening of the planned harvest unit was less than 20 acres in size which eliminates this requirement (Forest Plan, page 4-68). No concerns were identified in this unit that would require a review for a RAW buffer.

TIMBER/LOGGING

This unit is planned for shovel yarding to a proposed temporary road off of NFSR 2054000.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2054000 (BMP 14.20, Road-4, Road-6). New temporary road construction, 0.43 miles (BMPs 14.5, Road-3, Road-5, Road-6).

BOTANY

No botany concerns.

INVASIVE SPECIES

No weeds are known from this area. To keep this area weed-free follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest. Specifically follow recommendations under Activity Cards 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, inspect all borrow pits before use and transport of rock to the units or new roads.

FISHERIES

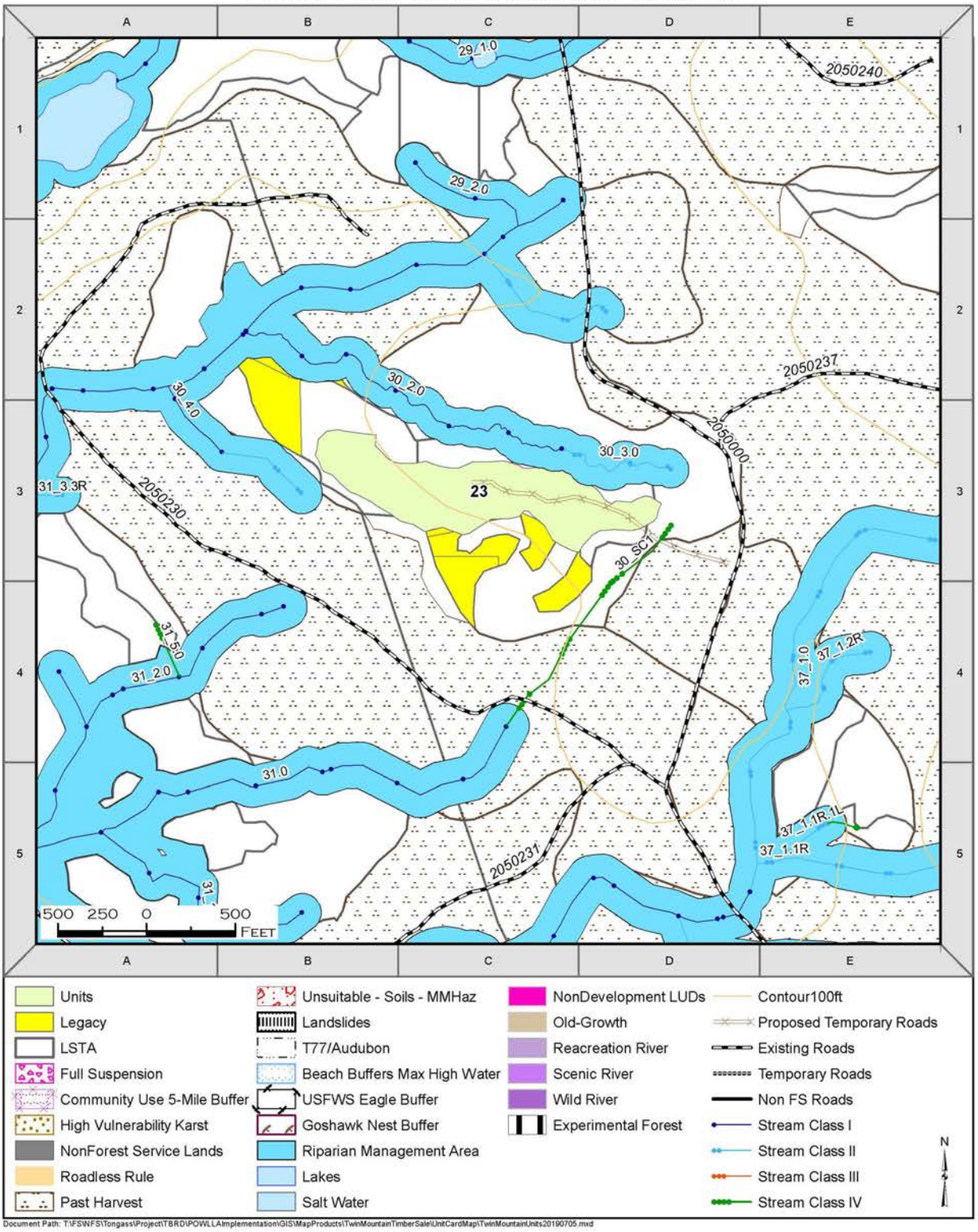
Stream Num.: Map Location C-4 / D-5
Stream Class: I
Channel Type: Lake
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class I for Lake: 100 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater
Concerns: N/A

Stream Num.: 24_1.0

Unit 19
Stream Class: I Channel Type: PAB Protection: Category A Flagging: B/W Buffer (RMA): Class I for PAB: 100 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater Concerns: N/A Stream Num.: 24_1.AR Stream Class: I Channel Type: PAO Protection: Category A Flagging: B/W Buffer (RMA): Class I for PAO: 100 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater Concerns: N/A Stream Num.: 24_2.1L Stream Class: I Channel Type: PAB Protection: Category A Flagging: B/W Buffer (RMA): Class I for PAB: 100 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater Concerns: N/A Stream Num.: 24_2.0.3R Stream Class: I Channel Type: PAB Protection: Category A Flagging: B/W Buffer (RMA): Class I for PAB: 100 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater Concerns: N/A
All Streams Protection/Mitigation Actions by Category: All Categories implement BMPs Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers. Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
There are 4 culverts specified for the temporary road accessing the unit across a wetland for cross drainage. No stream crossings are expected within the unit. Should temporary road locations be changed such that different streams would be crossed, structures and locations will be approved by USFS, in consultation with fisheries

Unit 19
biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3, 14.15 and AqEco-4.
GEOLOGY/KARST
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes are less than 25% with small knobs up to 35%. The soils and wetlands are suitable for shovel yarding. Follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMPs 12.5 and 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). Emergent short sedge wetlands are present in the northwest boundary of the unit (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4). The proposed temporary road traverses about 0.1 acres of emergent short sedge within the unit and about 0.2 acres outside of the unit. Wetland avoidance was not feasible due to the location of the existing road, fish streams, lake, and the location of wetlands within the unit. Follow R10 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 23



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Unit 23							
Unit Number:	23	**Total Harvest Unit Acres**	13.5	**Prescription:**	EA	**Harvest System:**	Shovel
VCU Number:	5880	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		302

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock in the overstory with lesser amounts of spruce and cedar irregularly distributed throughout. Stand structure is variable, containing breaks in the canopy from tree mortality and windthrow where a variety of trees sizes are found, but also has areas of continuous canopy cover where overstory trees are well-stocked. Trees range in size from small seedlings to large diameter dominant overstory individuals. Snags and downed wood are distributed throughout. The understory is predominantly blueberry with lesser amounts of rusty menziesia and red huckleberry. Forbs commonly found in old-growth are distributed throughout but in varied densities. This stand is mature with light stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections are moderate and some insect damage has been noted in the overstory. The risk for windthrow in this stand is moderate due to its exposure to southeasterly winds coming off adjacent muskegs and past harvest, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. Because the potential opening of the planned harvest unit was greater than 20 acres in size, legacy is designated for retention to meet this requirement (Forest Plan, page 4-68). RAW buffers along the Class I streams to the north and west of this unit were initially indicated but were determined to be unnecessary after field review by qualified specialists.

TIMBER/LOGGING

This unit is planned for shovel yarding to landings located along a proposed temporary road off of NFSR 2050000. The proposed temporary road enters the unit from the east.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2050000 (BMP 14.20, Road-4, Road-6). New temporary road construction, 0.30 miles (BMPs 14.5, Road-3, Road-5, Road-6).

BOTANY

No botany concerns.

INVASIVE SPECIES

Weeds are in the area of the unit along NFSR 2050000. Follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest, but specifically in 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, to reduce the risk of further introduction, inspect all borrow pits before use and transport of rock to the units or new roads. See Krosse 2017 for all BMP's.

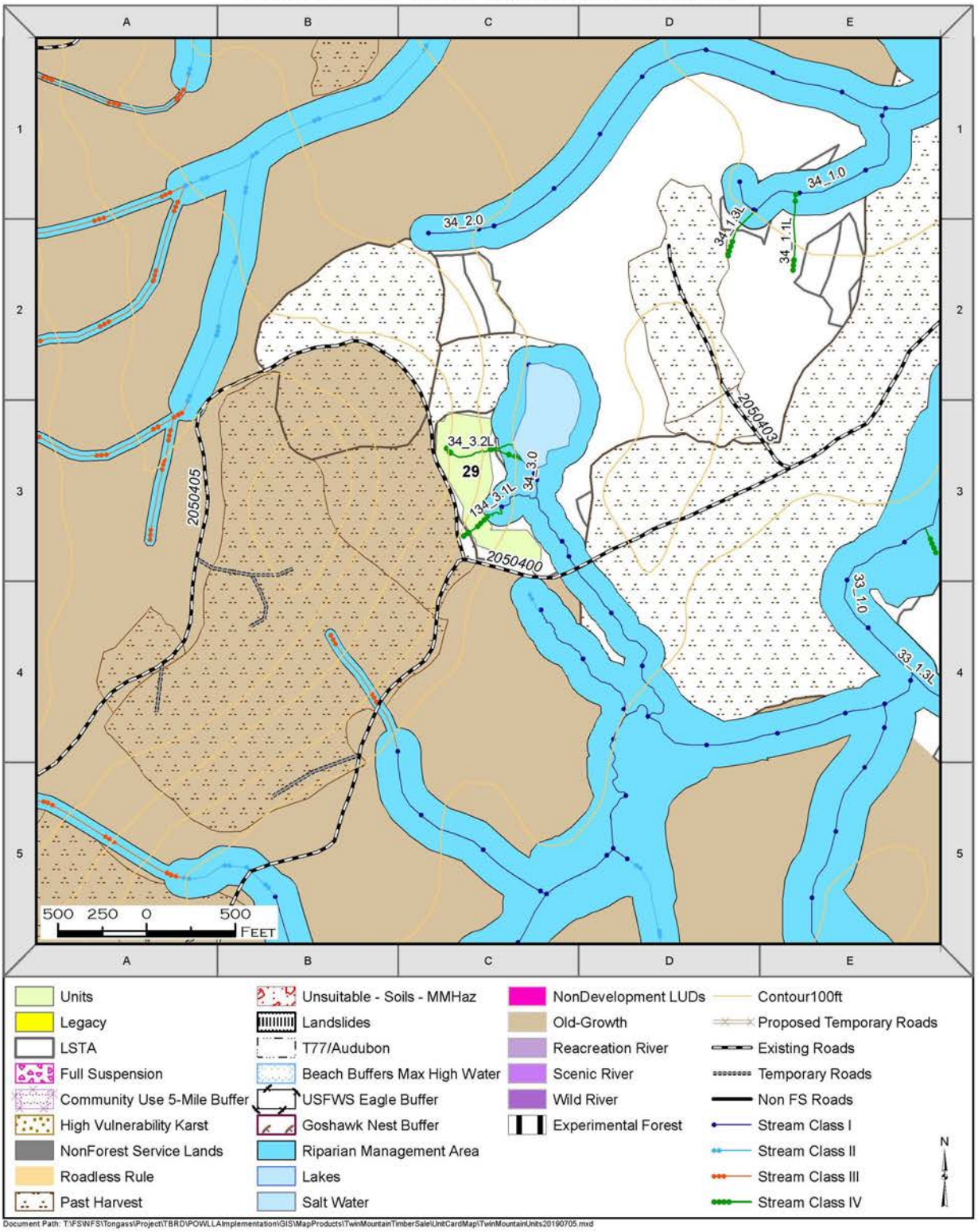
FISHERIES

Stream Num.: 30_2.0 / 30_3.0
Stream Class: I, II
Channel Type: PAO, PAB, HCLw
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class I for PAO: 100 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater

Unit 23
Class I for PAB: 100 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater Class II for HCLw: 100 feet or to the top of the side-slope break; whichever is greater Class II for PAO: 100 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater Concerns: N/A Stream Num.: 30_4.0 Stream Class: II Channel Type: PAB Protection: Category A Flagging: B/W Buffer (RMA): Class II for PAB: 100 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater Concerns: N/A Stream Num.: 30_SC1 Stream Class: IV Channel Type: PAO Protection: Category C Flagging: G/W Buffer (RMA): Class IV for PAO: No buffer Concerns: N/A
All Streams Protection/Mitigation Actions by Category: All Categories implement BMPs Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers. Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
Temporary road has one stream crossing planned for Class IV stream outside of unit. No stream crossings anticipated within unit. Should temporary road locations be changed such that different streams would be crossed, structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3, 14.5 and AqEco-4.
GEOLOGY/KARST
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.

Unit 23
SOILS/WETLANDS
Slopes are generally less than 25% with small areas up to 35%. The soils and wetlands are suitable for shovel yarding. Follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMP 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). Forested wetlands are dominant throughout the unit (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4). The proposed temporary road traverses about 1 acre of forested wetland in the unit and ½ acre outside the unit. Wetland avoidance was not feasible due to the location of the existing road and the dominance of forested wetland within the unit. Follow R10 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 29



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Unit 29							
Unit Number:	29	**Total Harvest Unit Acres**	4.7	**Prescription:**	EA	**Harvest System:**	Shovel
VCU Number:	5880	**LUD:**	Modified Landscape		**Net Harvest Volume (MBF):**		106

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are not defined by a single dominant overstory species, but rather by a mixture of many species. This stand predominantly contains western hemlock, redcedar, and yellow-cedar in varying degrees and densities. Spruce, mountain hemlock, and shorepine are also found but at low densities and infrequently. The stand structure is complex and the canopy is fairly broken throughout and due mainly to poor soil drainage but also tree mortality. Overstory trees vary in size but are smaller in diameter than other forest types, and moderately-to-poorly stocked. Snags and downed wood are common throughout. The understory is heavy throughout because of breaks in the canopy and contains a variety of well-distributed shrubs and forbs. This stand is mature with light stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections in the overstory are light. The risk for windthrow in this stand is moderate due to its exposure to winds coming off an adjacent lake, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. However, the potential opening of the planned harvest unit was less than 20 acres in size which eliminates this requirement (Forest Plan, page 4-68). No concerns were identified in this unit that would require a review for a RAW buffer.

TIMBER/LOGGING

This unit is planned for shovel yarding to landings located along NFSR 2050400 and NFSR 2050405.

ENGINEERING/SYSTEM ROADS

Access via existing NFS roads 2050400 and 2050405 (BMP 14.20, Road-4, Road-6).

BOTANY

No botany concerns.

INVASIVE SPECIES

No weeds are known from this area. To keep this area weed-free follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest. Specifically follow recommendations under Activity Cards 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, inspect all borrow pits before use and transport of rock to the units or new roads.

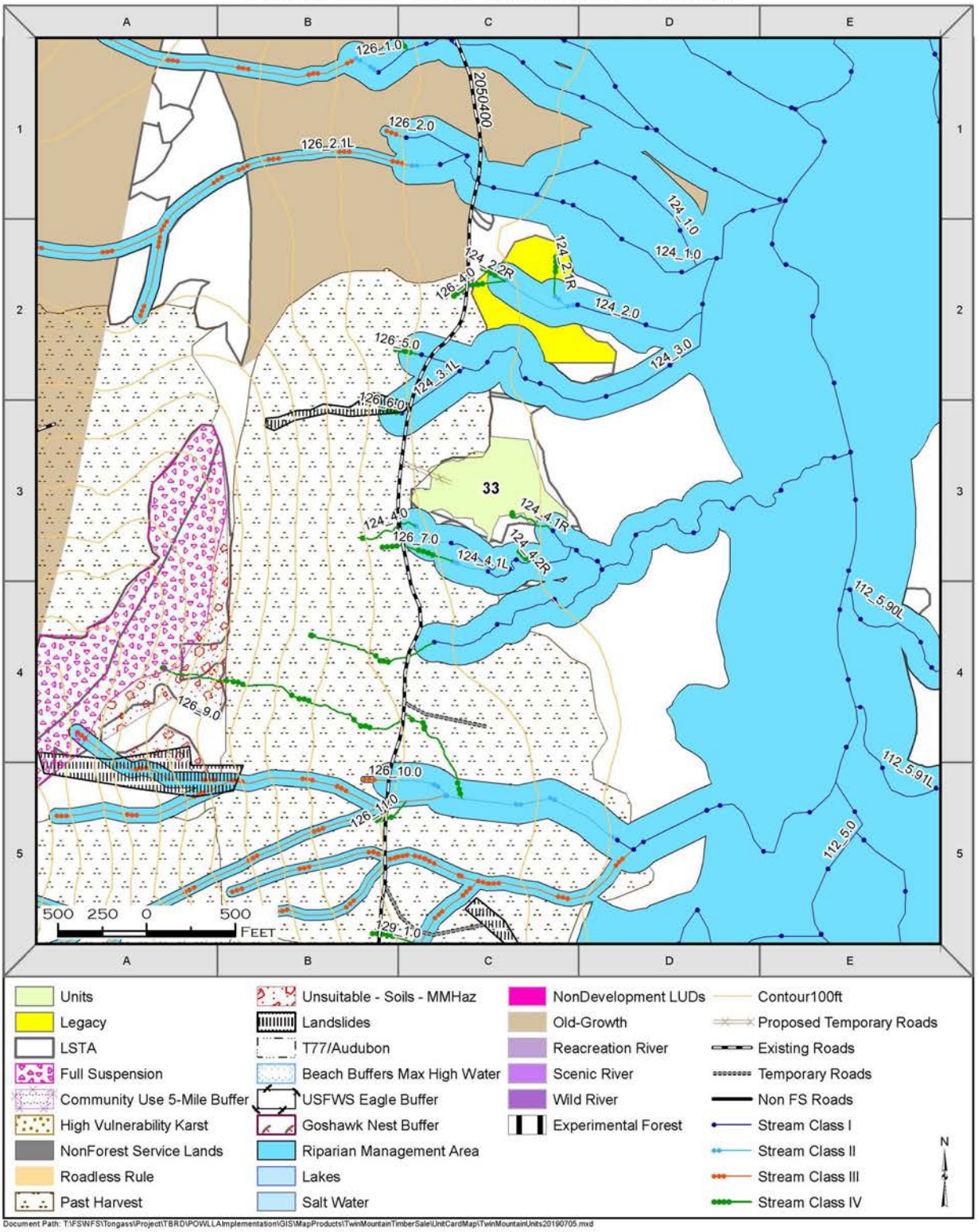
FISHERIES

Stream Num.: 34_3.0
Stream Class: I
Channel Type: MMO, L
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class I for MMO: 120 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater
Class I for Lake: 100 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater
Concerns: N/A

Unit 29
Stream Num.: 34_3.1L Stream Class: I, IV Channel Type: MCO, MMO Protection: Category A and C Flagging: B/W Buffer (RMA): Class I for MCO: 120 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater Class IV for MCO: No buffer Class IV for MMO: No buffer Concerns: N/A Stream Num.: 34_3.2L Stream Class: IV Channel Type: HCO Protection: Category C Flagging: G/W Buffer (RMA): Class IV for HCO: No buffer Concerns: N/A Stream Num.: Map Location C-3 (34_3.3L) Stream Class: IV Channel Type: HCO Protection: Category C Flagging: G/W Buffer (RMA): Class IV for HCO: No buffer Concerns: N/A Stream Num.: Map Location C-3 / D-3 (34_10.0) Stream Class: II Channel Type: HCLw Protection: Category A Flagging: B/W Buffer (RMA): Class II for HCLw: 100 feet or to the top of the side-slope break; whichever is greater Concerns: N/A
All Streams Protection/Mitigation Actions by Category: All Categories implement BMPs Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers. Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
N/A No temporary roads planned. Should temporary road/stream crossings be needed, crossing structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3 and 14.5.
GEOLOGY/KARST
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.

Unit 29
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes are up to 35% in the unit. The soils and wetlands are suitable for shovel yarding. Follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMPs 12.5 and 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). Forested wetland/ emergent short sedge is present along the eastern fringe of the unit (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4).
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 33



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Unit 33							
Unit Number:	33	**Total Harvest Unit Acres**	6.3	**Prescription:**	EA	**Harvest System:**	Shovel
VCU Number:	5880	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		141

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock in the overstory with lesser amounts of spruce and cedar irregularly distributed throughout. Stand structure is variable, containing breaks in the canopy from tree mortality and windthrow where a variety of trees sizes are found, but also has areas of continuous canopy cover where overstory trees are well-stocked. Trees range in size from small seedlings to large diameter dominant overstory individuals. Snags and downed wood are distributed throughout. The understory is predominantly blueberry with lesser amounts of rusty menziesia and red huckleberry. Forbs commonly found in old-growth are distributed throughout but in varied densities. This stand is mature with moderate stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections in the overstory are heavy. The risk for windthrow in this stand is moderate due to its exposure to winds coming off an adjacent muskeg, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. Because the potential opening of the planned harvest unit was greater than 20 acres in size, legacy is designated for retention to meet this requirement (Forest Plan, page 4-68). No concerns were identified in this unit that would require a review for a RAW buffer.

TIMBER/LOGGING

This unit is planned for shovel yarding to landings located along a proposed temporary road off of NFSR 2050400.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2050400 (BMP 14.20, Road-4, Road-6). New temporary road construction, 0.06 miles (BMPs 14.5, Road-3, Road-5, Road-6).

BOTANY

No botany concerns.

INVASIVE SPECIES

No weeds are known from this area. To keep this area weed-free follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest. Specifically follow recommendations under Activity Cards 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, inspect all borrow pits before use and transport of rock to the units or new roads.

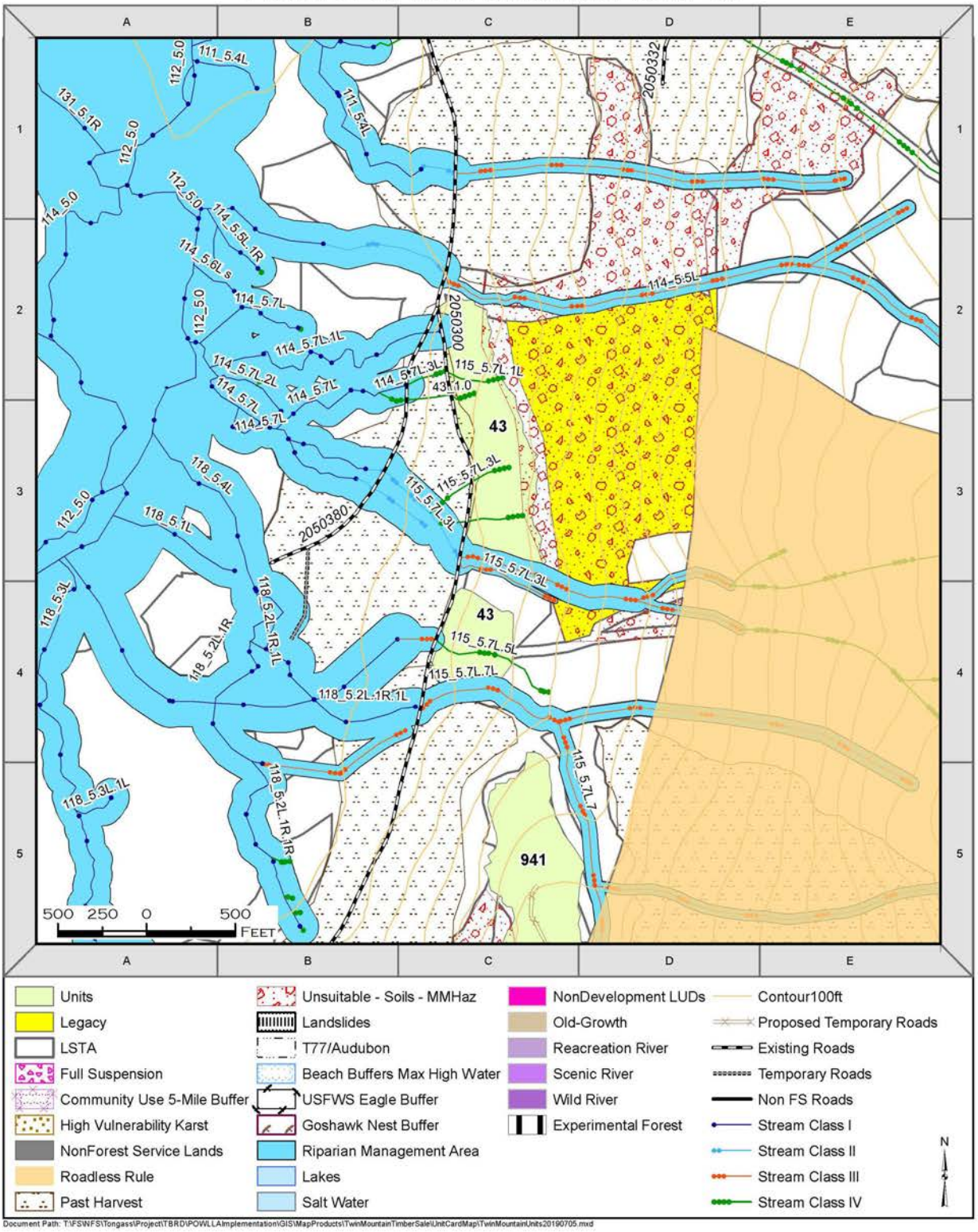
FISHERIES

Stream Num.: 124_4.0
Stream Class: I, II, IV
Channel Type: FPO, MMO, HCO
Protection: Category A and C
Flagging: B/W, G/W
Buffer (RMA):
Class I for FPO: 130 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater
Class I for MMO: 120 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater
Class II for HCO: 100 feet or to the top of the side-slope break, whichever is greater

Unit 33
Class IV for HCO: No buffer Concerns: Extreme Blowdown Stream Num.: 124_4.1R Stream Class: I, IV Channel Type: MMO Protection: Category A and C Flagging: B/W, G/W Buffer (RMA): Class I for MMO: 120 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater Class IV for MMO: No buffer Concerns: N/A Stream Num.: 124_4.1L Stream Class: I, II Channel Type: MMO, HCO Protection: Category A Flagging: B/W, G/W Buffer (RMA): Class I for MMO: 120 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater Class II for HCO: 100 feet or to the top of the side-slope break, whichever is greater Concerns: N/A Stream Num.: 124_4.2R Stream Class: IV Channel Type: HCO Protection: Category C Flagging: G/W Buffer (RMA): Class IV for HCO: No buffer Concerns: N/A
All Streams Protection/Mitigation Actions by Category: All Categories implement BMPs Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers. Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
No reconstructed NFS road, and no stream crossings specified for temporary road. Should temporary road locations be changed such that different streams would be crossed, structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3, 14.5 and AqEco-4.
GEOLOGY/KARST
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.

Unit 33
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes are gentle along the western half and steepen to 55% on the eastern half although the majority of the slopes are less than 35% in the west. The soils and wetlands are suitable for shovel yarding. Follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMP 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). Forested wetlands are dominant throughout the unit (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4). The proposed temporary road traverses about 0.1 acre of forested wetland within the unit and about ¼ acre outside the unit. Wetland avoidance was not feasible due to the location of the existing road and the abundance of forested wetland within and surrounding the unit. Follow R10 BMPs12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 43



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Unit 43							
Unit Number:	43	**Total Harvest Unit Acres**	15.7	**Prescription:**	EA	**Harvest System:**	Shovel
VCU Number:	5880	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		351

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock in the overstory with lesser amounts of spruce and cedar irregularly distributed throughout. Stand structure is variable, containing breaks in the canopy from tree mortality and windthrow where a variety of trees sizes are found, but also has areas of continuous canopy cover where overstory trees are well-stocked. Trees range in size from small seedlings to large diameter dominant overstory individuals. Snags and downed wood are distributed throughout. The understory is predominantly blueberry with lesser amounts of rusty menziesia and red huckleberry. Forbs commonly found in old-growth are distributed throughout but in varied densities. This stand is mature with light stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections in the overstory are light. The risk for windthrow in this stand is high due to its exposure to southwesterly winds coming off adjacent muskegs and past harvest, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. Because the potential opening of the planned harvest unit (both Unit 43 and 941 combined) was greater than 20 acres in size, legacy is designated for retention to meet this requirement (Forest Plan, page 4-68). RAW buffers along the Class III streams within the southern end of this unit have been prescribed.

TIMBER/LOGGING

This unit is planned for shovel yarding to landings located along NFSR 2050300.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2050300 (BMP 14.20, Road-4, Road-6).

BOTANY

No botany concerns.

INVASIVE SPECIES

Weeds are in the area of the unit along NFSR 2050300. Follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest, but specifically in 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, to reduce the risk of further introduction, inspect all borrow pits before use and transport of rock to the units or new roads. See Krosse 2017 for all BMP's.

FISHERIES

Stream Num.: 114_5.5L
Stream Class: II, III
Channel Type: HCM
Protection: Category A and B
Flagging: B/W, O/W
Buffer (RMA):
Class II for HCM: 100 feet or to the top of the side-slope break; whichever is greater
Class III for HCM: To the top of the side-slope break
Concerns: N/A

Stream Num.: 114_5.7L.1L
Stream Class: I

Unit 43

Channel Type: HCO
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class I for HCO: 100 feet or to the top of the side-slope break; whichever is greater
Concerns: N/A

Stream Num.: 115_5.7L.1L
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 115_5.7L.3L
Stream Class: II, III
Channel Type: HCM, HCV
Protection: Category A and B
Flagging: B/W, O/W
Buffer (RMA):
Class II for HCM: 100 feet or to the top of the side-slope break; whichever is greater
Class III for HCV: To the top of the side-slope break
Concerns: N/A

Stream Num.: Map Location C-3 (115_5.7L.3L.2L)
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

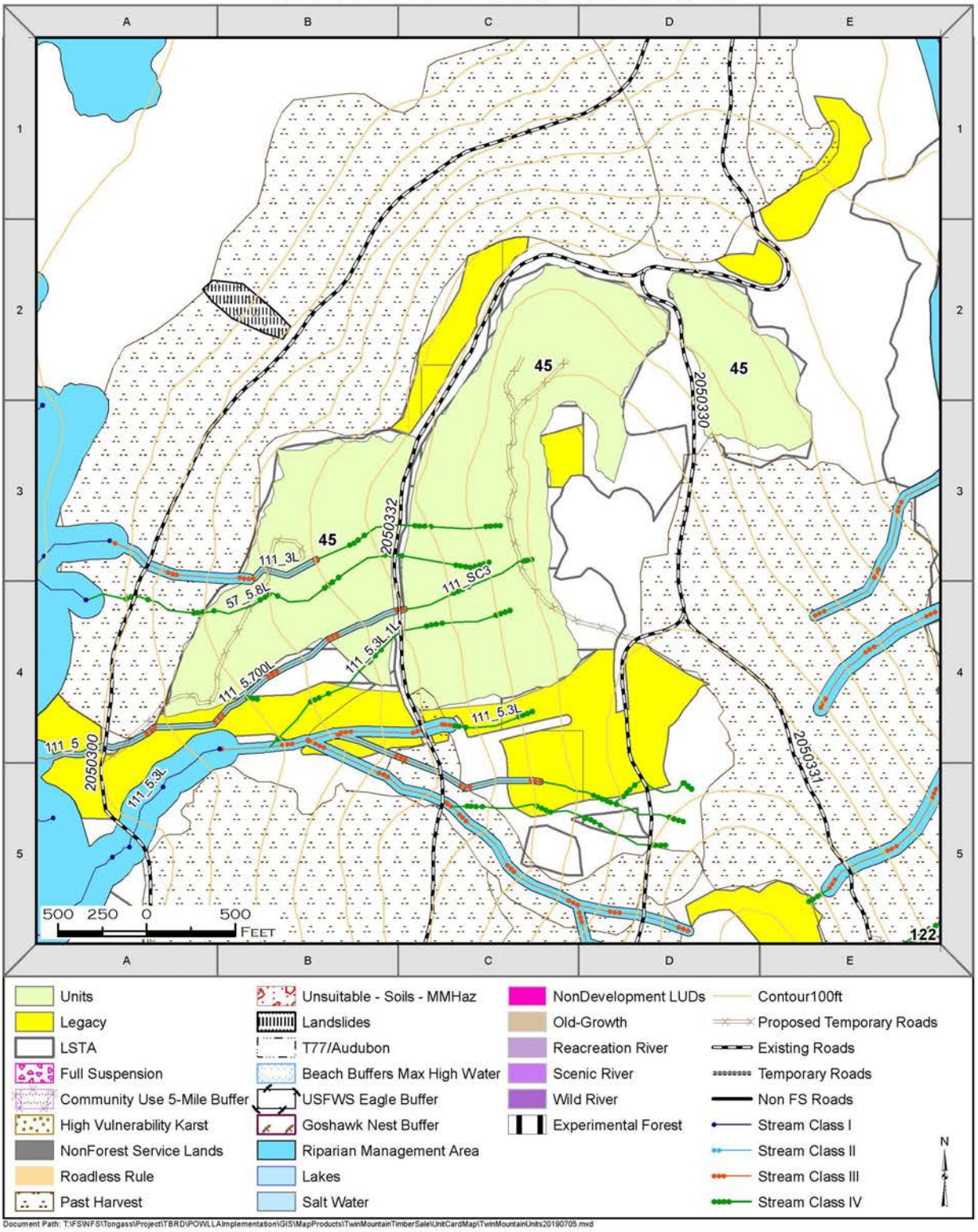
Stream Num.: Map Location C-3 (115_5.7L.3L.1R)
Stream Class: II, III
Channel Type: HCO
Protection: Category B
Flagging: O/W
Buffer (RMA):
Class III for HCO: To the top of the side-slope break
Concerns: RAW buffer for this and adjacent stream is reflected in layout

Stream Num.: 115_5.7L.5L
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: Stream mapped as HCV Class III, but is HCO Class IV

Stream Num.: 115_5.7L.7L
Stream Class: III
Channel Type: HCV
Protection: Category B
Flagging: O/W
Buffer (RMA):
Class III for HCV: To the top of the side-slope break
Concerns: N/A

Unit 43
Stream Num.: 43_1.0 Stream Class: IV Channel Type: HCO Protection: Category C Flagging: G/W Buffer (RMA): Class IV for HCV: No buffer Concerns: N/A
All Streams Protection/Mitigation Actions by Category: All Categories implement BMPs Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers. Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
No temporary roads planned. Should temporary road/stream crossings be needed, crossing structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3 and 14.5.
GEOLOGY/KARST
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes range from 20-55% in the current unit. Approximately 59 acres were excluded to the east of the unit due to very steep erosive slopes, wet slopes with cliffs, and recent landslides. The remaining area is suitable for harvest with shovel. Follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMPs 12.5 and 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). Forested wetland was observed intermixed in the unit (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4).
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 45



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Unit 45							
Unit Number:	45	**Total Harvest Unit Acres**	85.7	**Prescription:**	EA	**Harvest System:**	Shovel, Cable
VCU Number:	5880	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		1921

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock in the overstory with lesser amounts of spruce and cedar irregularly distributed throughout. Stand structure is variable, containing breaks in the canopy from tree mortality and windthrow where a variety of trees sizes are found, but also has areas of continuous canopy cover where overstory trees are well-stocked. Trees range in size from small seedlings to large diameter dominant overstory individuals. Snags and downed wood are distributed throughout. The understory is predominantly blueberry with lesser amounts of rusty menziesia and red huckleberry. Forbs commonly found in old-growth are distributed throughout but in varied densities. This stand is mature with moderate to heavy stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections in the overstory are moderate. The risk for windthrow in this stand is moderate due to its exposure to southeasterly winds coming off adjacent past harvest, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. Because the potential opening of the planned harvest unit was greater than 20 acres in size, legacy is designated for retention to meet this requirement (Forest Plan, page 4-68). A RAW buffer along the Class III stream within this unit was initially indicated but the stream designations were corrected to Class IV and so it was determined to be unnecessary after field review by qualified specialists.

TIMBER/LOGGING

This unit is planned for shovel, uphill, and downhill cable yarding to landings located along two proposed temporary roads off of NFSR 2050300 and NFSR 2050330.

ENGINEERING/SYSTEM ROADS

Access via existing NFS roads 2050300, 2050330 and 2050332 (BMP 14.20, Road-4, Road-6) and new temporary road construction, 0.86 miles (BMPs 14.5, Road-3, Road-5, Road-6).

BOTANY

No restrictions for botany.

INVASIVE SPECIES

Weeds are in the area of the unit along NFSR 2050300. Follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest, but specifically in 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, to reduce the risk of further introduction, inspect all borrow pits before use and transport of rock to the units or new roads. See Krosse 2017 for all BMP's.

FISHERIES

Stream Num.: 111_3L
Stream Class: III, IV
Channel Type: HCM, HCO
Protection: Category B and C
Flagging: O/W, G/W
Concerns: NA
Buffer (RMA):
Class III for HCM: To the top of the side-slope break
Class III for HCO: To the top of the side-slope break
Class IV for HCO: No buffer

Unit 45

Concerns: N/A

Stream Num.: 57_5.8L
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 111_5.700L / 111_SC3
Stream Class: III, IV
Channel Type: HCO
Protection: Category B and C
Flagging: O/W, G/W
Buffer (RMA):
Class III for HCO: To the top of the side-slope break
Class IV for HCO: No buffer
Concerns: Extreme Blowdown

Stream Num.: Map Location B-4 (111_5.700L.1R)
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 111_5.3L
Stream Class: I, III, IV
Channel Type: HCM, HCL, HCO
Protection: Category A, B, and C
Flagging: B/W, O/W, G/W
Buffer (RMA):
Class I for HCM: 100 feet or to the top of the side-slope break; whichever is greater
Class III for HCM: To the top of the side-slope break
Class III for HCL: To the top of the side-slope break
Class IV for HCO: No buffer
Concerns: N/A

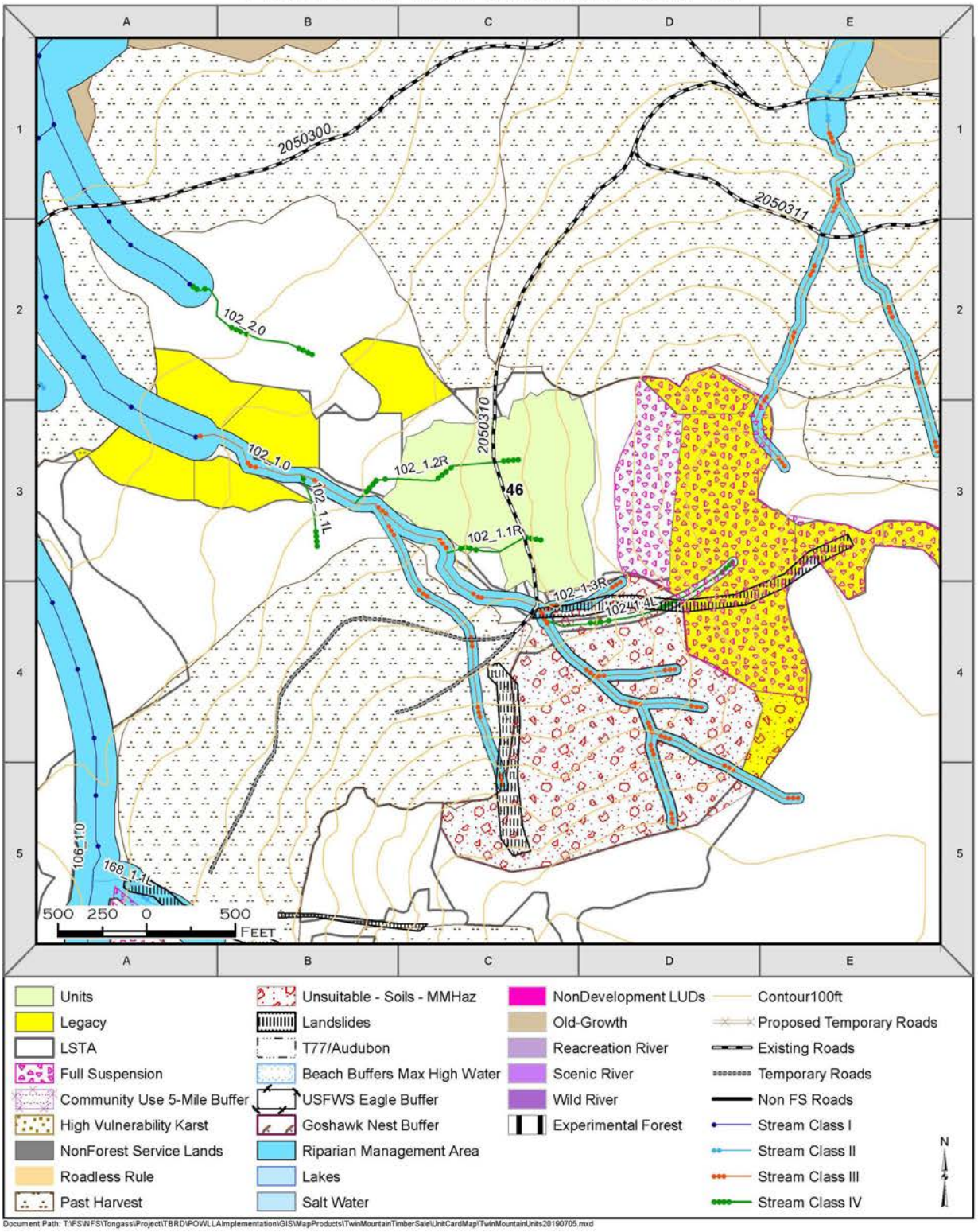
Stream Num.: 111_5.3L.1L
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

All Streams Protection/Mitigation Actions by Category:
All Categories implement BMPs
Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers.

Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and

Unit 45
selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
The reconstructed system roads accessing this unit do not specify any culvert work. There are four temporary road crossings for Class IV streams within this unit and four additional culverts specified to provide non-stream drainage at unspecified locations. There is one Class III crossing outside of the unit on the temporary road stemming from NFS 2050300. Should temporary road locations be changed such that different streams would be crossed, structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3, 14.5 and AqEco-4.
GEOLOGY/KARST
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes average 30 to 65%. Wet soils and forested wetlands are dominant throughout the unit. Avoid wet slopes with shovel yarding. The unit is suitable for shovel and cable harvest with a minimum of partial suspension (R10 BMPS 12.5, 13.5, and 13.9 and National Core BMPs Plan-2, AqEco-2, AqEco-4, Veg-1, Veg-2, Veg-5, and Veg-6). Follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMP 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). Forested wetlands are abundant throughout the unit with forested wetland/ emergent short sedge located in the eastern polygon (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4). The proposed temporary roads traverse about ¼ acre of forested wetland. Wetland avoidance was not feasible due to the location of the existing road, steeper slopes, and the location of wetlands within the unit. Follow R10 BMPs12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
July or August goshawk surveys have been completed in all portions of the unit. Goshawk surveys required for May or June have not been completed in the western lobe of the unit. These surveys must be completed in this area prior to implementation. There was a possible detection in May June surveys in the eastern portion of this unit. Follow-up survey on this detection on 27 June 2019 had no detections. All resource-specific protections and mitigations will be applied before harvest activities are implemented.

POW LLA Twin Mountain Unit 46



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Unit 46							
Unit Number:	46	**Total Harvest Unit Acres**	21	**Prescription:**	EA	**Harvest System:**	Cable
VCU Number:	5580	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		470

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock in the overstory with lesser amounts of spruce and cedar irregularly distributed throughout. Stand structure is variable, containing breaks in the canopy from tree mortality and windthrow where a variety of trees sizes are found, but also has areas of continuous canopy cover where overstory trees are well-stocked. Trees range in size from small seedlings to large diameter dominant overstory individuals. Snags and downed wood are distributed throughout. The understory is predominantly blueberry with lesser amounts of rusty menziesia and red huckleberry. Forbs commonly found in old-growth are distributed throughout but in varied densities. This stand is mature with moderate to heavy stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections in the overstory are light. The risk for windthrow in this stand is moderate due to its exposure to southerly winds coming off adjacent past harvest, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. Because the potential opening of the planned harvest unit was greater than 20 acres in size, legacy is designated for retention to meet this requirement (Forest Plan, page 4-68). No concerns were identified in this unit that would require a review for a RAW buffer.

TIMBER/LOGGING

This unit is planned for uphill and downhill cable yarding to landings located off of NFSR 2050310.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2050310 (BMP 14.20, Road-4, Road-6).

BOTANY

No botany concerns.

INVASIVE SPECIES

Weeds are in the area of the unit along NFSR 2050310. Follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest, but specifically in 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, to reduce the risk of further introduction, inspect all borrow pits before use and transport of rock to the units or new roads. See Krosse 2017 for all BMP's.

FISHERIES

Stream Num.: 102_1.0
Stream Class: III
Channel Type: HCD
Protection: Category B
Flagging: O/W
Buffer (RMA):
Class III for HCD: To the top of the side-slope break
Concerns: N/A

Unit 46

Stream Num.: 102_1.1R
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 102_1.2R
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 102_1.3R
Stream Class: III
Channel Type: HCM
Protection: Category B
Flagging: O/W
Buffer (RMA)
Class III for HCM: To the top of the side-slope break
Concerns: N/A

Stream Num.: 102_4.1L
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

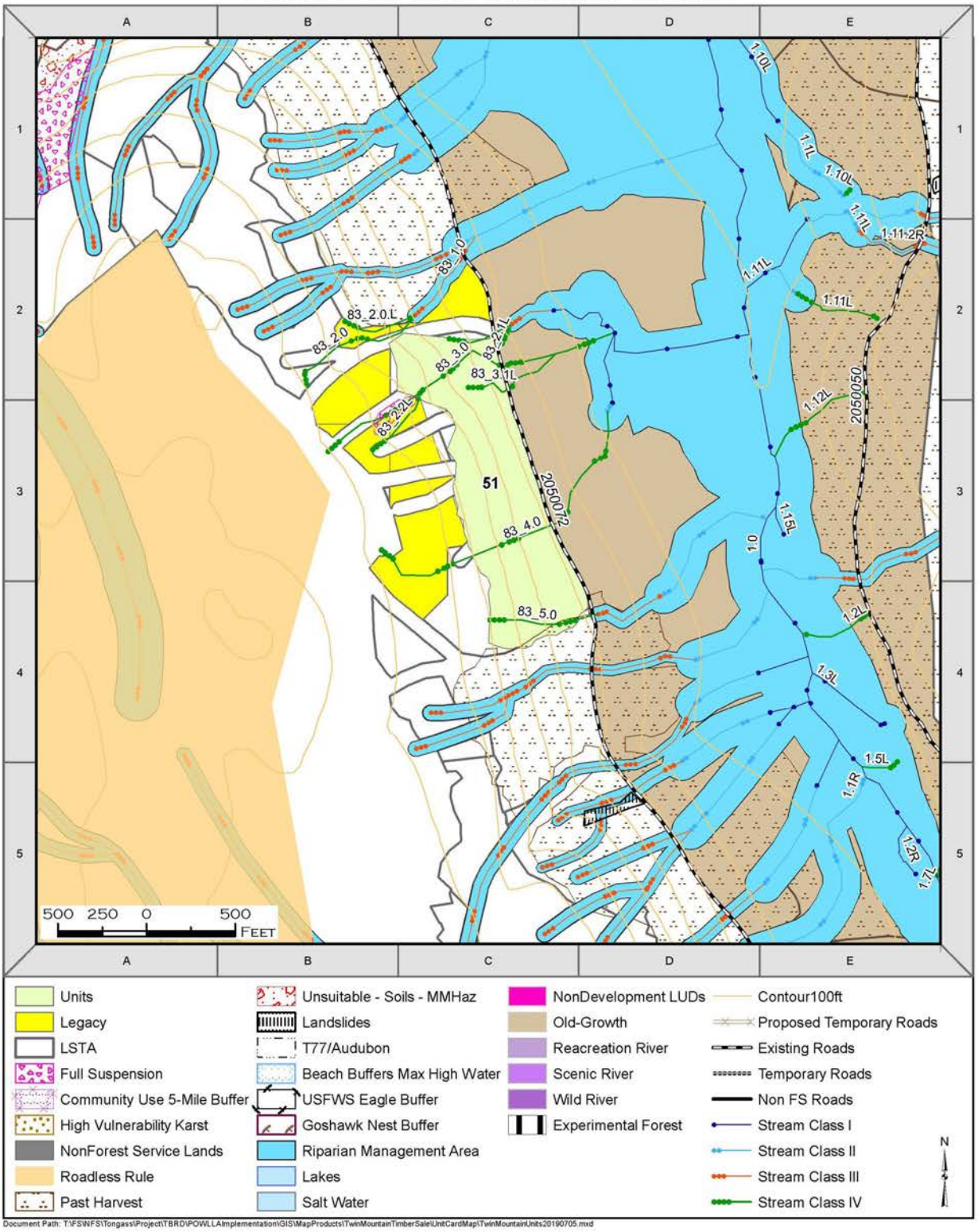
Stream Num.: Map Location B-3 / C-4 / C-5
Stream Class: III
Channel Type: HCM
Protection: Category B
Flagging: O/W
Buffer (RMA):
Class IV for HCO: To the top of the side-slope break
Concerns: N/A

All Streams Protection/Mitigation Actions by Category:
All Categories implement BMPs
Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers.

Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers.

Unit 46
Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
No temporary roads have been planned. Should temporary road/stream crossings be needed, crossing structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3 and 14.5.
GEOLOGY/KARST
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes range from 35 to >72%. Approximately 45 acres were excluded to the south of this unit due to very high landslide prone terrain, recent landslides, and water quality issues. About 35 acres are only suitable for harvest with full suspension along the eastern boundary. The remainder of the unit is suitable for harvest with cable yarding with a minimum of partial suspension (R10 BMP 13.9 and National Core BMPs Plan-2, Veg-2, Veg-4, Veg-5, and Veg-6). Forested wetland/ emergent short sedge wetlands are abundant in the polygon on the west side of the road on gentle terrain (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4).
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected. This area functions as an elevational corridor.

POW LLA Twin Mountain Unit 51



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Unit 51							
Unit Number:	51	**Total Harvest Unit Acres**	20	**Prescription:**	EA	**Harvest System:**	Cable
VCU Number:	5900	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		448

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock with a strong component of yellow-cedar in the overstory, but also contains lesser amounts of spruce and redcedar. Stand structure is complex with breaks throughout the canopy from overstory mortality and variable soil drainage. Tree sizes cover a wide range and stocking ranges from moderate-to-well stocked. Yellow-cedar snags are common throughout, with lesser amounts of snags of different species. The understory layer is brushy, mainly blueberry but has a strong component of rusty menziesia, and is more evenly distributed throughout because of breaks in the canopy. Forbs commonly found in old-growth are distributed throughout. This stand is mature with moderate stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections in the overstory are moderate. The risk for windthrow in this stand is moderate due to its exposure to southerly winds coming off adjacent past harvest, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. Because the potential opening of the planned harvest unit was greater than 20 acres in size, legacy is designated for retention to meet this requirement (Forest Plan, page 4-68). A RAW buffer along the Class III stream to the south of this unit was initially indicated but was determined to be unnecessary after field review by qualified specialists.

TIMBER/LOGGING

This unit is planned for downhill cable yarding to landings located along NFSR 2050072.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2050072 (BMP 14.20, Road-4, Road-6).

BOTANY

No restrictions for botany.

INVASIVE SPECIES

No weeds are known from this area in GIS, but no recent surveys were conducted. To keep this area weed-free follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest. Specifically, follow recommendations under Activity Cards 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly inspect all borrow pits before use and transport of rock to the units or new roads.

FISHERIES

Stream Num.: 83_1.0 / 83_2.0
Stream Class: III, IV
Channel Type: HCD
Protection: Category B and C
Flagging: O/W, G/W
Buffer (RMA):
Class III for HCD: To the top of the slope break
Class IV for HCD: No Buffer
Concerns: N/A

Stream Num.: 83_2.0L / 183_1.1L
Stream Class: IV

Unit 51

Channel Type: HCD
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCD: No Buffer
Concerns: N/A

Stream Num.: Map Location C-2 (83_2.1L)
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No Buffer
Concerns: N/A

Stream Num.: 83_3.0 / 83_2.1L
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No Buffer
Concerns: Geometry incorrect, should be the same stream

Stream Num.: Map Location C-2 (83_3.1L)
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No Buffer
Concerns: N/A

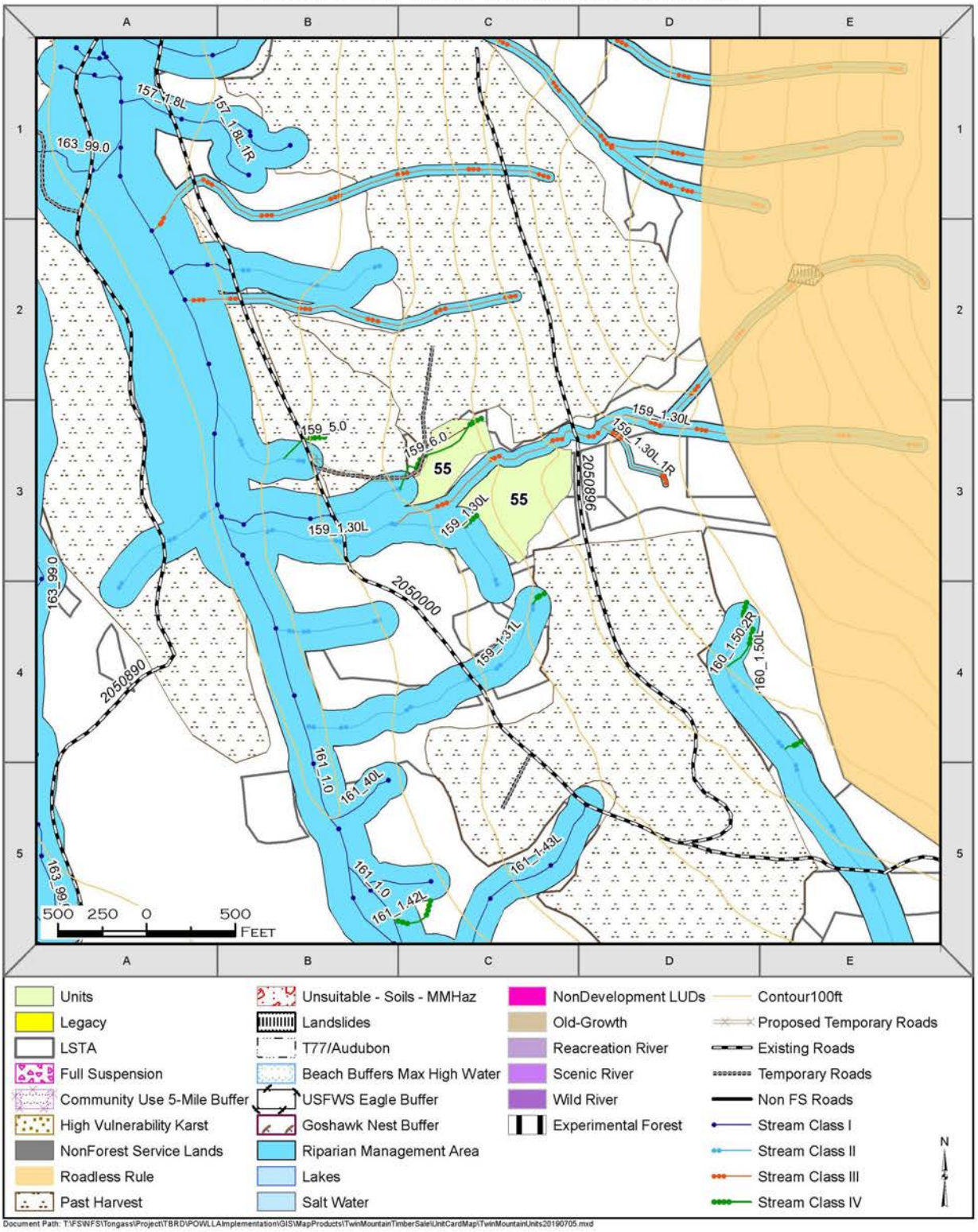
Stream Num.: 83_2.2L
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No Buffer
Concerns: N/A

Stream Num.: 83_4.0
Stream Class: IV
Channel Type: HCD, HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCD: No Buffer
Class IV for HCO: No Buffer
Concerns: N/A

Stream Num.: Map Location C-4 / D-4 (83_5.0)
Stream Class: III, IV
Channel Type: HCD, HCO
Protection: Category B and C
Flagging: O/W, G/W
Buffer (RMA):
Class III for HCD: To the top of the side-slope break
Class IV for HCO: No Buffer

Unit 51
Concerns: N/A Stream Num.: Map Location B-4 / C-4 / D-4 Stream Class: III Channel Type: HCM Protection: Category B Flagging: O/W Buffer (RMA): Class III for HCM: To the top of the side-slope break Concerns: N/A
All Streams Protection/Mitigation Actions by Category: All Categories implement BMPs Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers. Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
The reconstruction of NFS 2050072 specifies a re-installation of culvert outside the unit for a Class III stream (AqEco-4). There are no temporary roads planned. Should temporary road/stream crossings be needed, crossing structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3 and 14.5.
GEOLOGY/KARST
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes range from 25% to greater than 72%. All areas greater than 60% are 50 to 100ft rock outcrops. All slopes are suitable for harvest with a minimum of partial suspension with cable yarding and will meet soil and wetland resource concerns (R10 BMPS 12.5, 13.5, and 13.9 and National Core BMPs Plan-2, AqEco-2, AqEco-4, Veg-1, Veg-2, Veg-5, and Veg-6).
WILDLIFE
Goshawk surveys were completed in 2017; there were no goshawks detected.

POW LLA Twin Mountain Unit 55



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Unit 55							
Unit Number:	55	**Total Harvest Unit Acres**	8.4	**Prescription:**	EA	**Harvest System:**	Shovel
VCU Number:	5890	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		188

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock with a strong component of redcedar in the overstory, but also contain lesser amounts of spruce and yellow-cedar. Stand structure is complex with small infrequent breaks in the canopy from overstory mortality and variable soil drainage. Tree sizes cover a wide range and stocking ranges from moderate-to-well stocked. Snags are common throughout and fairly well-distributed. The understory layer is moderately brushy, mainly blueberry, but has a strong component of rusty menziesia, and is unevenly distributed. Forbs commonly found in old-growth are distributed throughout. This stand is mature with moderate stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections in the overstory are moderate. The risk for windthrow in this stand is moderate due to its exposure to southerly winds coming off adjacent past harvest, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. RAW buffers along the Class II and III streams within this unit were initially indicated but were determined to be unnecessary after field review by qualified specialists.

TIMBER/LOGGING

This unit is planned for shovel yarding to landings along NFSR 2050896 and temporary road construction off of the 2050000 road.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2050896 and road 2050000 (BMP 14.20, Road-4, Road-6) and temporary road construction on existing prism, 0.15 miles (BMPs 14.5, Road-3, Road-5, Road-6).

BOTANY

No botany concerns.

INVASIVE SPECIES

No weeds are known from this area. To keep this area weed-free follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest. Specifically follow recommendations under Activity Cards 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, inspect all borrow pits before use and transport of rock to the units or new roads.

FISHERIES

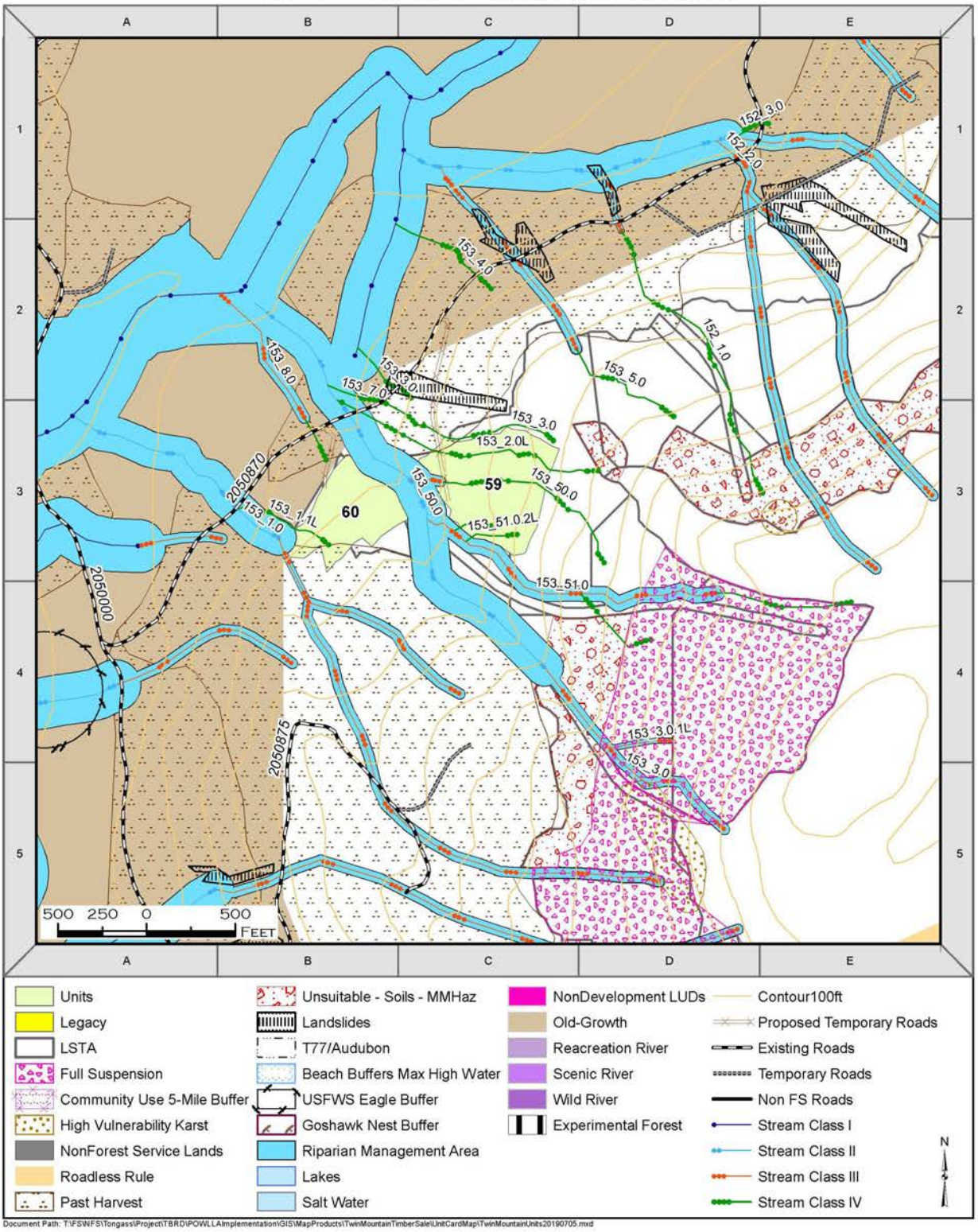
Stream Num.: 159_1.30L
Stream Class: II, III
Channel Type: HCL, HCD
Protection: Category A and B
Flagging: B/W, O/W
Buffer (RMA):
Class II for HCL: 100 feet or to the top of the side-slope break; whichever is greater
Class III of HCD: To the top of the side-slope break
Concerns: N/A

Stream Num.: 159_1.30L.1R
Stream Class: II
Channel Type: HCO

Unit 55
Protection: Category A Flagging: B/W Buffer (RMA): Class II for HCO: 100 feet or to the top of the side-slope break; whichever is greater Concerns: N/A Stream Num.: 159_1.30L (159_1.30L.1R.1L) Stream Class: IV Channel Type: HCO Protection: Category C Flagging: G/W Buffer (RMA): Class IV for HCO: No buffer Concerns: N/A Stream Num.: 159_6.0 Stream Class: II, IV Channel Type: HCO Protection: Category A and C Flagging: B/W, G/W Buffer (RMA): Class II for HCO: 100 feet or to the top of the side-slope break; whichever is greater Class IV for HCO: No buffer Concerns: N/A
All Streams Protection/Mitigation Actions by Category: All Categories implement BMPs Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers. Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
No specified culvert work. Unit is accessed by reconditioned NFS road, and reconstructed temporary road. Should temporary road/stream crossings be needed, crossing structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3 and 14.5.
GEOLOGY/KARST
Unit review and surveys have been completed. Some portions of the unit may be underlain by karst but it is deeply buried by glacial till. The karst vulnerability is low, no specific mitigation is required. No significant karst features were found in the unit.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.

Unit 55
SOILS/WETLANDS
Slopes average 25 to 65%. Wet soils and forested wetlands are dominant throughout the unit. The unit is suitable for shovel yarding and follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMP 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). Forested wetlands are abundant along the western side of the unit (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4).
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected. There were two marble murrelet detections in the unit; each require a 600-foot buffer. The area of this unit functions an elevational corridor. All resource-specific protections and mitigations will be applied before harvest activities are implemented.

POW LLA Twin Mountain Unit 59



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Unit 59							
Unit Number:	59	**Total Harvest Unit Acres**	8.3	**Prescription:**	EA	**Harvest System:**	Cable
VCU Number:	5890	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		186

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock with a strong component of redcedar in the overstory, but also contain lesser amounts of spruce and yellow-cedar. Stand structure is complex with small infrequent breaks in the canopy from overstory mortality and variable soil drainage. Tree sizes cover a wide range and stocking ranges from moderate-to-well stocked. Snags are common throughout and fairly well-distributed. The understory layer is moderately brushy, mainly blueberry, but has a strong component of rusty menziesia, and is unevenly distributed. Forbs commonly found in old-growth are distributed throughout. This stand is mature with moderate stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections in the overstory are light. The risk for windthrow in this stand is high due to its exposure to southwesterly winds coming off adjacent past harvest, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. No concerns were identified in this unit that would require a review for a RAW buffer.

TIMBER/LOGGING

This unit is planned for downhill cable yarding to landings located along a proposed temporary road off of NFSR 2050870.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2050870 (BMP 14.20, Road-4, Road-7). New temporary road construction, 0.20 miles (BMPs 14.5, Road-3, Road-5, Road-6).

BOTANY

No botany concerns.

INVASIVE SPECIES

No weeds are known from this area. To keep this area weed-free follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest. Specifically follow recommendations under Activity Cards 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, inspect all borrow pits before use and transport of rock to the units or new roads.

FISHERIES

Stream Num: Map Location B-3 / C-3 / C-4 (153_2.0)
Stream Class: II
Channel Type: HCM, HCD
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class II for HCM: 100 feet or to the top of the side-slope break
Class II for HCD: 100 feet or to the top of the side-slope break
Concerns: Stream class incorrect on map

Unit 59

Stream Num: 153_2.0L
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num: 153_2.1L / 153_50.0
Stream Class: III, IV
Channel Type: HCM, HCL, HCO
Protection: Category B and C
Flagging: O/W, G/W
Buffer (RMA):
Class III for HCM: To the top of the side-slope break
Class IV for HCL: No buffer
Class IV for HCO: No buffer
Concerns: N/A

Stream Num: 153_51.0
Stream Class: III
Channel Type: HCD
Protection: Category B
Flagging: O/W
Buffer (RMA):
Class III for HCD: to the top of the side-slope break
Concerns: N/A

Stream Num: Map Location C-3 (153_51.1L)
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

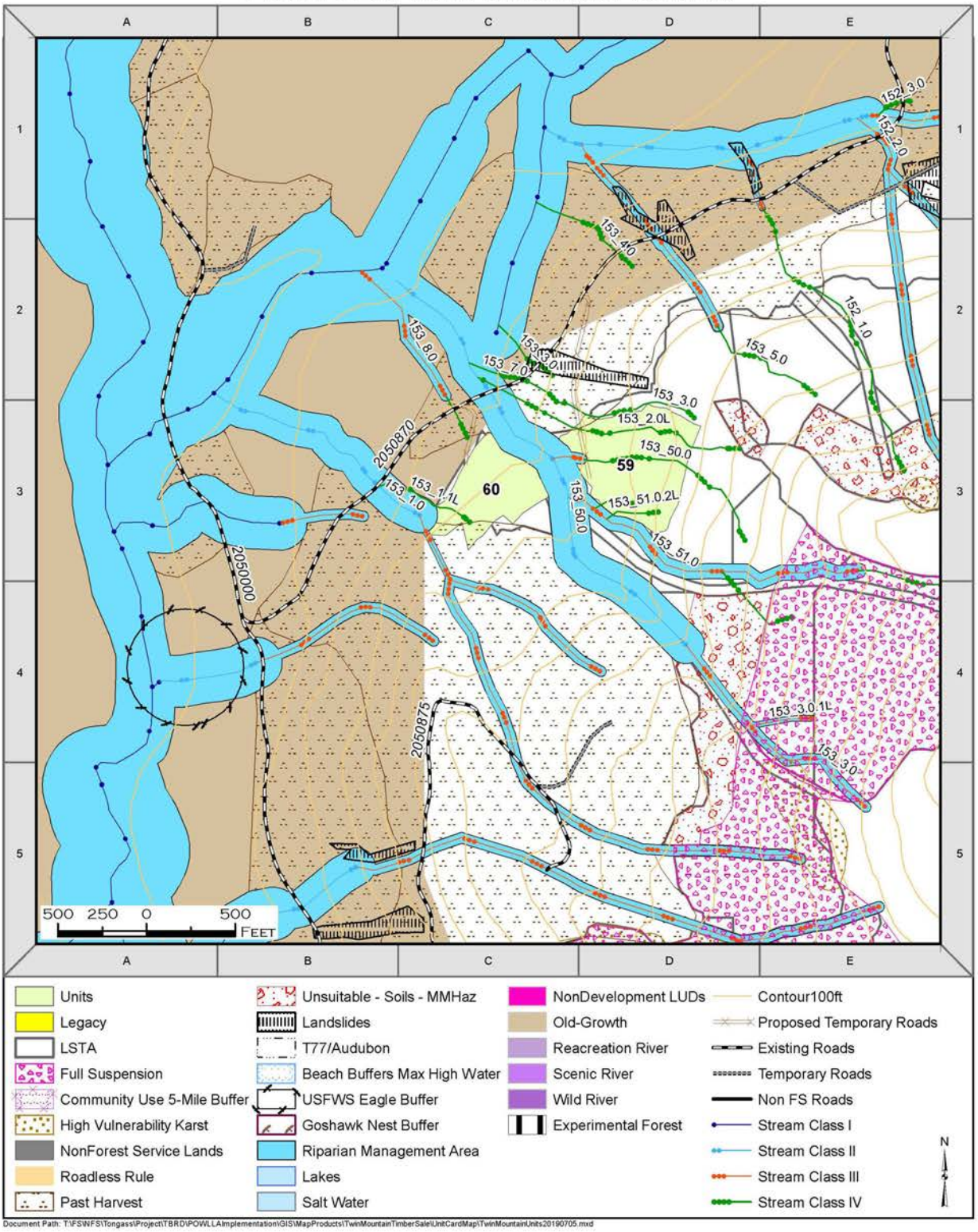
Stream Num: 153_51.0.2L
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num: 153_3.0 / 153_7.0 (Map Location C-3)
Stream Class: IV
Channel Type: HCL
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCL: No buffer
Concerns: N/A

Stream Num.: 153_3.0 (Map Location B-2)
Stream Class: IV
Channel Type: HCO
Protection: Category C

Unit 59
Flagging: G/W Buffer (RMA): Class IV for HCO: No buffer Concerns: N/A
All Streams Protection/Mitigation Actions by Category: All Categories implement BMPs Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers. Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
NFS road 2050870 reconditioning includes one Class II crossing that will require Title 16 concurrence and fish species timing at MP 0.38. There are three additional Class IV or non-stream crossings on NFS 2050870. There is one Class III and two Class IV stream crossings for the temporary road within the unit, and one Class IV crossing outside of the unit. Should temporary road locations be changed such that different streams would be crossed, structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3, 14.5 and AqEco-4.
GEOLOGY/KARST
Unit has been reviewed for karst and cave resources. The majority of the unit underlain by moderate vulnerability karst. No significant karst features were found in the unit. A harvest method that obtains partial suspension is required on the moderate vulnerability karst.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS
Slopes range from 25 to >72%. There are 25 acres of slopes outside of the unit boundary that were excluded from harvest in the east. These areas are unsuitable for harvest considerations due to extremely steep wet slopes and cliffs. The southern half of the unit has slopes >72% with multiple small cliffs and short steep pitches. All slopes are suitable for harvest with a minimum of partial suspension with cable yarding and will meet soil and wetland resource concerns (R10 BMPS 12.5, 13.5, and 13.9 and National Core BMPs Plan-2, AqEco-2, AqEco-4, Veg-1, Veg-2, Veg-5, and Veg-6). The proposed temporary road does not traverse any wetland. Follow R10 BMPs12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
Goshawk surveys were completed in 2017; no goshawks were detected. A small portion of the new temporary road construction of 0.20 miles will occur in an old growth reserve, as allowed by the Forest Plan.

POW LLA Twin Mountain Unit 60



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Unit 60							
Unit Number:	60	**Total Harvest Unit Acres**	5.3	**Prescription:**	EA	**Harvest System:**	Shovel
VCU Number:	5890	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		118

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock in the overstory with lesser amounts of spruce and cedar irregularly distributed throughout. Stand structure is variable, containing breaks in the canopy from tree mortality and windthrow where a variety of trees sizes are found, but also has areas of continuous canopy cover where overstory trees are well-stocked. Trees range in size from small seedlings to large diameter dominant overstory individuals. Snags and downed wood are distributed throughout. The understory is predominantly blueberry with lesser amounts of rusty menziesia and red huckleberry. Forbs commonly found in old-growth are distributed throughout but in varied densities. This stand is mature with moderate stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections in the overstory are light. The risk for windthrow in this stand is high due to its exposure to southwesterly winds coming off adjacent past harvest, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. This unit may require a RAW review; need for a buffer would be evaluated prior to implementation.

TIMBER/LOGGING

This unit is planned for shovel yarding to a landing located on a proposed temporary road off of NFSR 2050870.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2050870 (BMP 14.20, Road-4, Road-7). New temporary road construction, 0.10 miles (BMPs 14.5, Road-3, Road-5, Road-6, Road-7).

BOTANY

No botany concerns.

INVASIVE SPECIES

No weeds are known from this area. To keep this area weed-free follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest. Specifically follow recommendations under Activity Cards 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, inspect all borrow pits before use and transport of rock to the units or new roads.

FISHERIES

Stream Num.: 153_1.0
Stream Class: II, III
Channel Type: HCO
Protection: Category A and B
Flagging: B/W, O/W
Buffer (RMA):
Class II for HCO: 100 feet or to the top of the side-slope break; whichever is greater
Class III for HCO: To the top of the side-slope break
Concerns: Geometry and stream class incorrect on map

Stream Num.: Map Location C-4 (Northern 153_3.0)
Stream Class: III
Channel Type: HCM

Unit 60

Protection: Category B
Flagging: O/W
Buffer (RMA):
Class III for HCD: To the top of the side-slope break
Concerns: N/A

Stream Num.: Map Location C-4 (Southern153_3.0)
Stream Class: III
Channel Type: HCM
Protection: Category B
Flagging: O/W
Buffer (RMA):
Class III for HCD: To the top of the side-slope break
Concerns: N/A

Stream Num.: 153_1.1L
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: Map Location B-2 / C-2 / C-3/ D-4 (153_2.0 / 153_50.0)
Stream Class: II
Channel Type: HCL, HCM, HCD
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class II for HCL: 100 feet or to the top of the side-slope break; whichever is greater
Class II for HCM: 100 feet or to the top of the side-slope break; whichever is greater
Class II for HCD: 100 feet or to the top of the side-slope break; whichever is greater
Concerns: N/A

Stream Num.: 153_2.0L
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

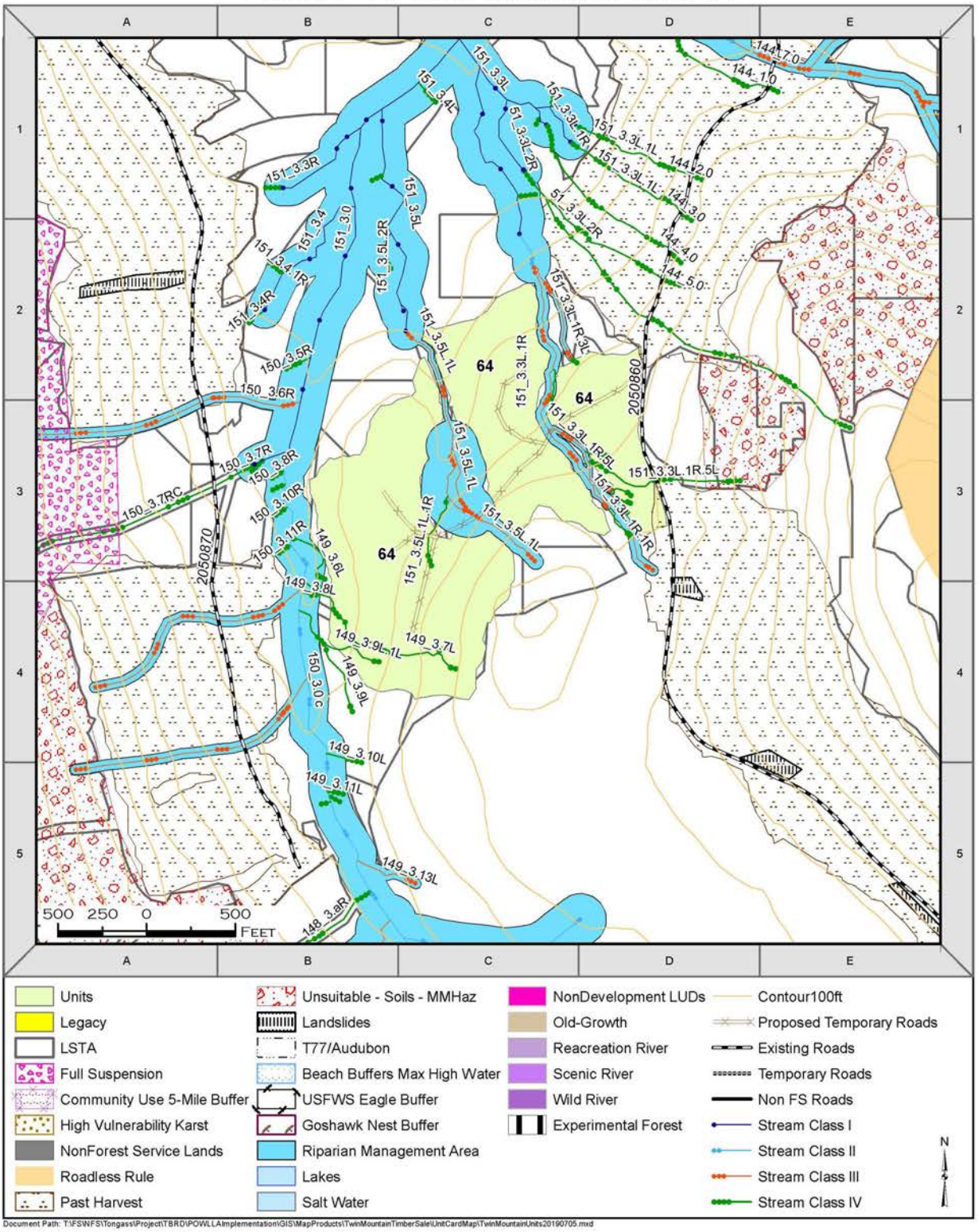
Stream Num.: 153_2.1L
Stream Class: III, IV
Channel Type: HCM, HCL, HCO
Protection: Category B and C
Flagging: O/W, G/W
Buffer (RMA):
Class III for HCM: To the top of the side-slope break
Class IV for HCL: No buffer
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 153_51.0
Stream Class: III

Unit 60
Channel Type: HCD Protection: Category B Flagging: O/W Buffer (RMA): Class III for HCD: To the top of the side-slope break Concerns: N/A Stream Num.: 153_8.0 Stream Class: IV Channel Type: MMO, HCLw Protection: Category C Flagging: G/W Buffer (RMA): Class IV for MMO: No buffer Class IV for HCLw: No buffer Concerns: N/A
All Streams Protection/Mitigation Actions by Category: All Categories implement BMPs Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers. Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
NFS road 2050870 reconditioning includes one Class II/Class III stream crossing that will require Title 16 concurrence and fish species timing at MP 0.22. There is one temporary road crossing for a Class IV or non-stream crossing outside of the unit. Should temporary road locations be changed such that different streams would be crossed, structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3, 14.5 and AqEco-4.
GEOLOGY/KARST
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.

Unit 60
SOILS/WETLANDS
Slopes generally are less than 35% with small 25 to 50ft pitches of slopes 35 to >72%. All slopes are suitable for harvest with shovel yarding and follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMP 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). The proposed temporary road does not traverse any wetland. Follow R10 BMPs12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected. The unit is adjacent to OGR. New temporary road construction of about 0.10 miles will occur within an old growth reserve, as allowed by Forest Plan.

POW LLA Twin Mountain Unit 64



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Unit 64							
Unit Number:	64	**Total Harvest Unit Acres**	54	**Prescription:**	EA	**Harvest System:**	Shovel, Cable
VCU Number:	5890	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		1212

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock in the overstory with lesser amounts of spruce and cedar irregularly distributed throughout. Stand structure is variable, containing breaks in the canopy from tree mortality and windthrow where a variety of trees sizes are found, but also has areas of continuous canopy cover where overstory trees are well-stocked. Trees range in size from small seedlings to large diameter dominant overstory individuals. Snags and downed wood are distributed throughout. The understory is predominantly blueberry with lesser amounts of rusty menziesia and red huckleberry. Forbs commonly found in old-growth are distributed throughout but in varied densities. This stand is mature with moderate to heavy stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections are light and some insect damage has been noted in the overstory. The risk for windthrow in this stand is high due to its exposure to southerly winds coming off adjacent muskegs and past harvest, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. RAW buffers along the Class III streams within this unit were initially indicated but were determined to be unnecessary after field review by qualified specialists.

TIMBER/LOGGING

This unit is planned for a combination of shovel, uphill, and downhill cable yarding to landings located along a proposed temporary road off of NFSR 2050860.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2050860 (BMP 14.20, Road-4, Road-7). New temporary road construction, 0.64 miles (BMPs 14.5, Road-3, Road-5, Road-6, Road-7).

BOTANY

No restrictions for botany.

INVASIVE SPECIES

No weeds are known from this area. To keep this area weed-free follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest. Specifically follow recommendations under Activity Cards 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, inspect all borrow pits before use and transport of rock to the units or new roads.

FISHERIES

Stream Num.: 149_3.6L
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: Map Location B-4 (149_3.6L.1L)
Stream Class: IV
Channel Type: HCO

Unit 64

Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 149_3.7L
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: Map Location C-4 (149_3.7L.1L)
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 149_3.8L
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 149_3.9L
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 149_3.9L.1L
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 150_3.0 / 151_3.0c
Stream Class: I, II
Channel Type: MMM, HCM
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class I for MMM: 120 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater
Class II for HCM: 100 feet or the top of the side-slope break; whichever is greater
Concerns: N/A

Unit 64

Stream Num.: 150_3.7R
Stream Class: I
Channel Type: HCO
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class I for HCM: 100 feet or the top of the side-slope break; whichever is greater
Concerns: N/A

Stream Num.: 150_3.8R
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: Map Location B-3 (150_3.9R)
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 150_3.10R
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 150_3.11R
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 151_3.3L.1R
Stream Class: II, III
Channel Type: HCM
Protection: Category A and B
Flagging: B/W, O/W
Buffer (RMA):
Class II for HCM: 100 feet or to the top of the side-slope break; whichever is greater
Class III for HCM: To the top of the side-slope break
Concerns: N/A

Unit 64

Stream Num.: 51_3.3L.2R
Stream Class: IV
Channel Type: HCM
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCM: No buffer
Concerns: N/A

Stream Num.: 151_3.3L.1R.1R
Stream Class: III, IV
Channel Type: HCO
Protection: Category B and C
Flagging: O/W, G/W
Buffer (RMA):
Class III for HCO: To the top of the side-slope break
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 151_3.3L.1R.3L
Stream Class: III, IV
Channel Type: HCO
Protection: Category B and C
Flagging: O/W, G/W
Buffer (RMA):
Class III for HCO: To the top of the side-slope break
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: Map Location C-2 (151_3.3L.1R.3L.1L)
Stream Class: III
Channel Type: HCO
Protection: Category B
Flagging: O/W
Buffer (RMA):
Class III for HCO: To the top of the side-slope break
Concerns: N/A

Stream Num.: Map Location C-2 (151_3.3L.1R.4L)
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 151_3.3L.1R.5L
Stream Class: III, IV
Channel Type: HCO
Protection: Category B and C
Flagging: O/W, G/W
Buffer (RMA):
Class III for HCO: To the top of the side-slope break
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: Map Location D-3 (151_3.3L.1R.5L.1L)
Stream Class: IV
Channel Type: HCO
Protection: Category C

Unit 64

Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: Map Location C-3 (151_3.3L.1R.5L.2L)
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: Map Location D-3 (151_3.3L.1R.5L.1R)
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: Map Location D-3 (151_3.3L.1R.5L.1R.1L)
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

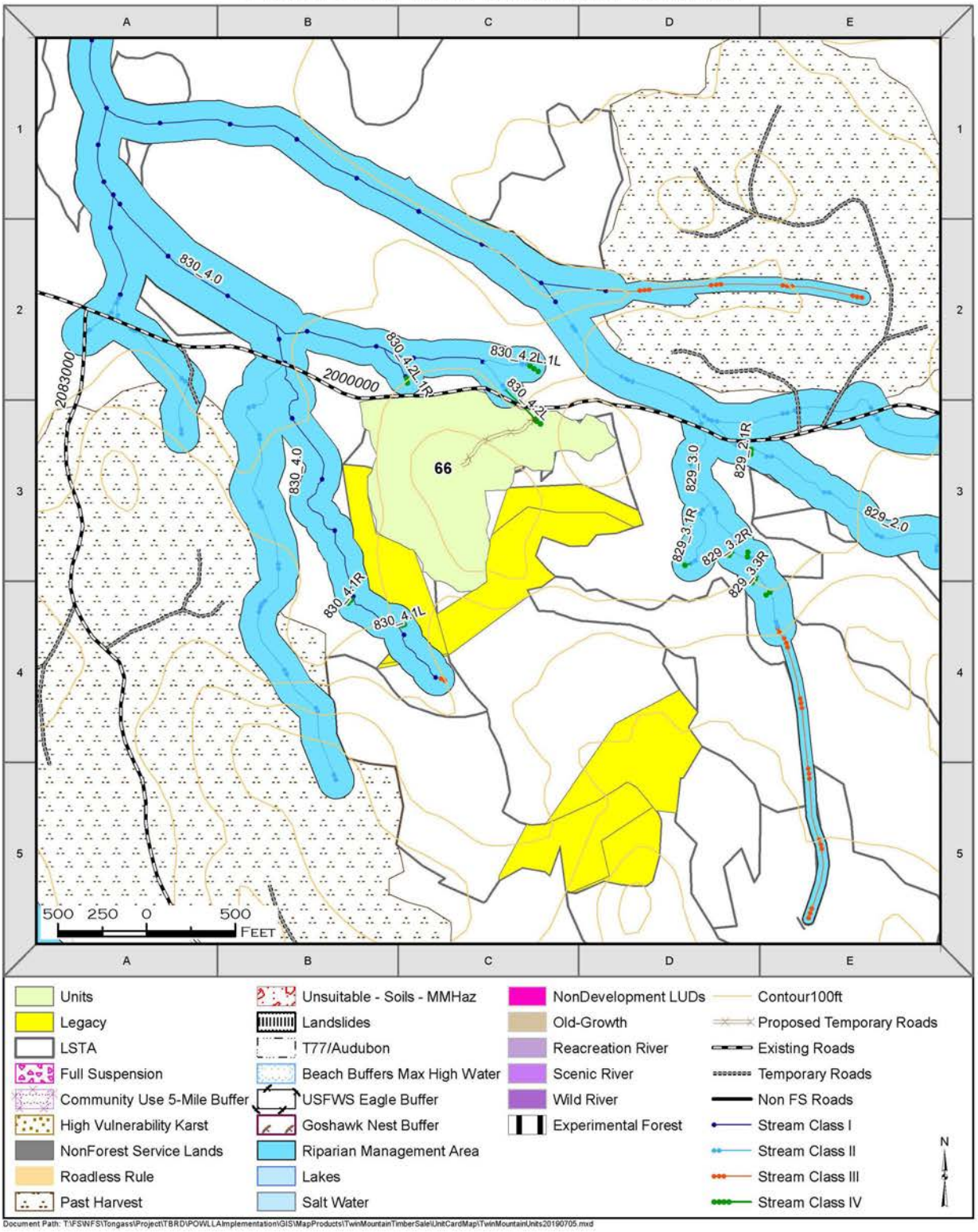
Stream Num.: 151_3.5L
Stream Class: I
Channel Type: MMS
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class I for MMS: 120 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater
Concerns: N/A

Stream Num.: 151_3.5L.1L
Stream Class: I, III
Channel Type: HCO, AFH, HCD
Protection: Category A and B
Flagging: B/W, O/W
Buffer (RMA):
Class I for HCO: 100 feet or to the top of the side-slope break; whichever is greater
Class III for HCO: To the top of the side-slope break
Class III for AFH: 140 feet or extent of the active portion of fan; whichever is greater
Class III for HCD: To the top of the side-slope break
Concerns: N/A

Unit 64
Stream Num.: 151_3.5L.1L.1R Stream Class: IV Channel Type: HCO Protection: Category C Flagging: G/W Buffer (RMA): Class IV for HCO: No buffer Concerns: N/A Stream Num.: 149_3.9L Stream Class: III Channel Type: HCM Protection: Category B Flagging: O/W Buffer (RMA): Class III for HCM: To the top of the side-slope break Concerns: N/A
All Streams Protection/Mitigation Actions by Category: All Categories implement BMPs Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers. Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
NFS road 2050860 reconditioning requires one removal and replacement of a cross drain or non-stream culvert. The temporary road requires two Class III crossings, three Class IV crossings and three non-stream crossings. All temporary road crossings are within the unit. Culvert at Stream Num. 151_3.5L.1L shall be removed immediately following operations to avoid failure. Should temporary road locations be changed such that different streams would be crossed, structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3, 14.5 and AqEco-4.
GEOLOGY/KARST
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes range from gentle to >72%. Most areas are 25 to 55% with small rock outcrop bands with slopes 65 to >72%. Split yarding is also recommended for a small debris torrent was found in the unit along a stream. The soils and wetlands are suitable for shovel and cable yarding with a minimum of partial suspension (R10 BMPS 12.5, 13.5, and 13.9 and National Core BMPs Plan-2, AqEco-2, AqEco-4, Veg-1, Veg-2, Veg-5, and Veg-6). Follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMP 13.9 and

National Core BMPs Plan-2, Veg-2, and Veg-4). Forested wetland are dominant in the majority if the unit (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4). The proposed temporary road traverses about 2 acres of forested wetland in the unit. Wetland avoidance was not feasible due to the location of the existing road, steeper slopes, and the location of wetlands within and surrounding the unit. Follow R10 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
Goshawk surveys have been completed; there was a possible detection in this unit. Follow up goshawk surveys had no detections. Bear den(s) located in unit. All resource-specific protections and mitigations will be applied before harvest activities are implemented.

POW LLA Twin Mountain Unit 66



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Unit 66							
Unit Number:	66	**Total Harvest Unit Acres**	19.7	**Prescription:**	EA	**Harvest System:**	Shovel
VCU Number:	5300	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		443

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock with a strong component of yellow-cedar in the overstory, but also contains lesser amounts of spruce and redcedar. Stand structure is complex with breaks throughout the canopy from overstory mortality and variable soil drainage. Tree sizes cover a wide range and stocking ranges from moderate-to-well stocked. Yellow-cedar snags are common throughout, with lesser amounts of snags of different species. The understory layer is brushy, mainly blueberry but has a strong component of rusty menziesia, and is more evenly distributed throughout because of breaks in the canopy. Forbs commonly found in old-growth are distributed throughout. This stand is mature with heavy stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections in the overstory are light. The risk for windthrow in this stand is moderate due to its exposure to northerly winds coming off Buster Bay and Sumner Strait, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. No concerns were identified in this unit that would require a review for a RAW buffer.

TIMBER/LOGGING

This unit is planned for shovel and yarding to landings located along a proposed temporary road off of NFSR 2000000.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2000000 (BMP 14.20, Road-4, Road-7). New temporary road construction, 0.12 miles (BMPs 14.5, Road-3, Road-5, Road-6, Road-7).

BOTANY

No restrictions for botany.

INVASIVE SPECIES

Weeds are in the area of the unit along NFSR 2000000. Follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest, but specifically in 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, to reduce the risk of further introduction, inspect all borrow pits before use and transport of rock to the units or new roads. See Krosse 2017 for all BMP's.

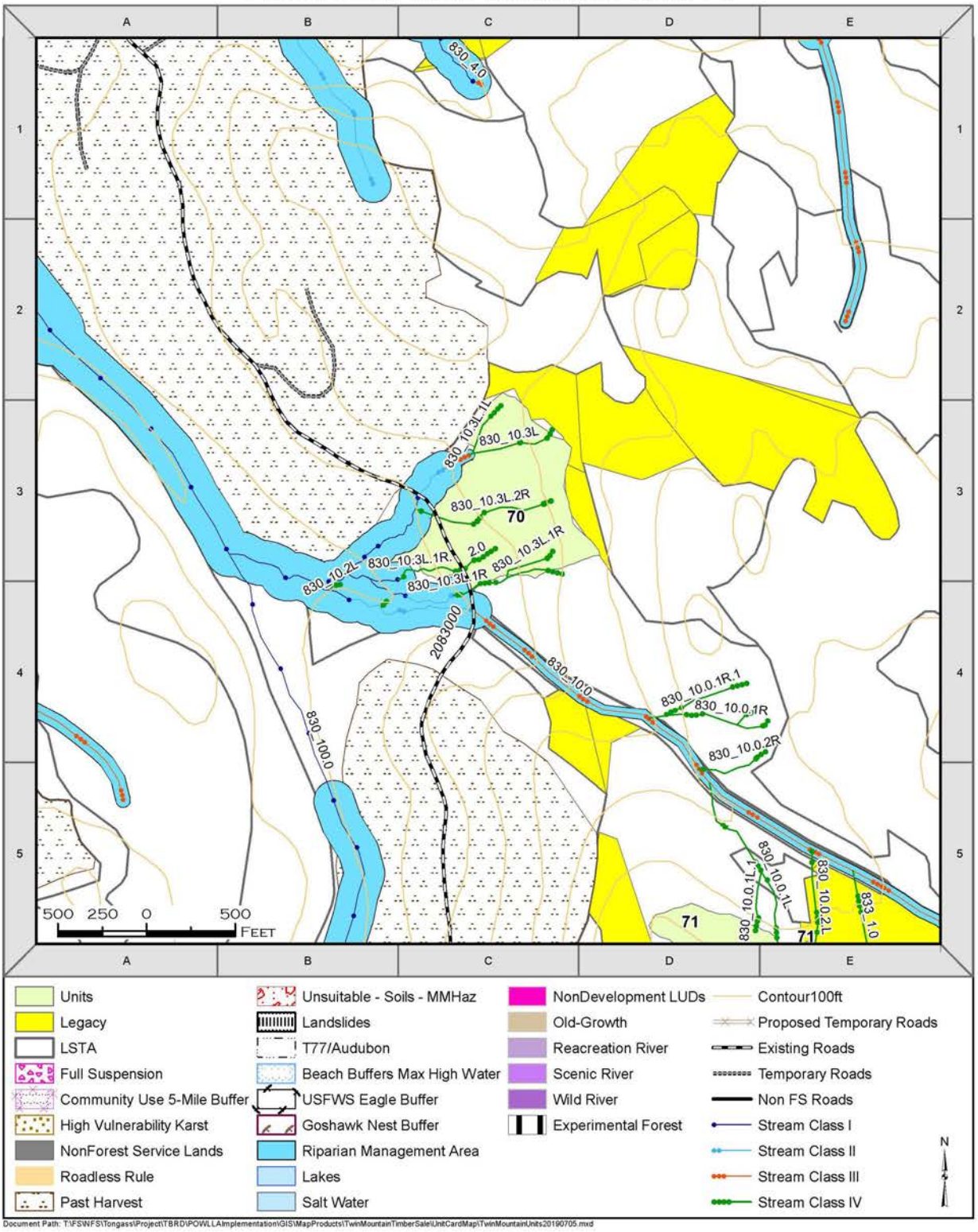
FISHERIES:

Stream Num.: 830_4.2L
Stream Class: I, II, IV
Channel Type: HCO
Protection: Category A and C
Flagging: B/W, G/W
Buffer (RMA):
Class I for HCO: 100 feet or to the top of the side-slope break; whichever is greater
Class II for HCO: 100 feet or to the top of the side-slope break; whichever is greater
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 830_4.2L.1L
Stream Class: II

Unit 66
Channel Type: HCO Protection: Category A Flagging: B/W Buffer (RMA): Class II for HCO: 100 feet or to the top of the side-slope break; whichever is greater Concerns: N/A Stream Num.: 830_4.2L.1R Stream Class: I, IV Channel Type: HCO Protection: Category A and C Flagging: B/W, G/W Buffer (RMA): Class I for HCO: 100 feet or to the top of the side-slope break; whichever is greater Class IV for HCO: No buffer Concerns: N/A
All Streams Protection/Mitigation Actions by Category: All Categories implement BMPs Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers. Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY There are two culverts specified for the temporary road inside of this unit, one for a Class IV stream and one for a non-stream. Should temporary road locations be changed such that different streams would be crossed, structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3, 14.5 and AqEco-4.
GEOLOGY/KARST
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes are less than 55%. The soils and wetlands are suitable for a minimum of partial suspension cable yarding and shovel yarding (R10 BMPS 12.5, 13.5, and 13.9 and National Core BMPs Plan-2, AqEco-2, AqEco-4, Veg-1, Veg-2, Veg-5, and Veg-6). Follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMPs 12.5 and 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). The proposed temporary road does not traverse any wetland. Follow R10 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 70



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Unit 70							
Unit Number:	70	**Total Harvest Unit Acres**	15.5	**Prescription:**	EA	**Harvest System:**	Shovel
VCU Number:	5300	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		347

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock with a strong component of yellow-cedar in the overstory, but also contains lesser amounts of spruce and redcedar. Stand structure is complex with breaks throughout the canopy from overstory mortality and variable soil drainage. Tree sizes cover a wide range and stocking ranges from moderate-to-well stocked. Yellow-cedar snags are common throughout, with lesser amounts of snags of different species. The understory layer is brushy, mainly blueberry but has a strong component of rusty menziesia, and is more evenly distributed throughout because of breaks in the canopy. Forbs commonly found in old-growth are distributed throughout. This stand is mature with heavy stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections in the overstory are moderate. The risk for windthrow in this stand is high due to its exposure to northwesterly winds coming off adjacent past harvest, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. A RAW buffer along the Class II stream along the northwest boundary of this unit was initially indicated but was determined to be unnecessary after field review by qualified specialists.

TIMBER/LOGGING

This unit is planned for shovel yarding to landings located along NFSR 2083000.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2083000 (BMP 14.20, Road-4, Road-7).

BOTANY

No restrictions for botany.

INVASIVE SPECIES

Weeds are in the area of the unit along NFSR 2083000. Follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest, but specifically in 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, to reduce the risk of further introduction, inspect all borrow pits before use and transport of rock to the units or new roads. See Krosse 2017 for all BMP's.

FISHERIES

Stream Num.: 830_10.0
Stream Class: II, III
Channel Type: HCM
Protection: Category A and B
Flagging: B/W, O/W
Buffer (RMA):
Class II for HCM: 100 feet or to the top of the side-slope break; whichever is greater
Class III for HCM: to the top of the side-slope break
Concerns: N/A

Stream Num.: 830_10.3L
Stream Class: I, II, III, IV
Channel Type: MMO, HCO, HCM
Protection: Category A, B, and C
Flagging: B/W, O/W, G/W

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Buffer (RMA):
Class I for MMO: 120 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater
Class I for HCO: 100 feet or to the top of the side-slope break; whichever is greater
Class II for HCM: 100 feet or to the top of the side-slope break; whichever is greater
Class III for HCM: To the top of the side-slope break
Class IV for HCO: No buffer
Concerns: Blowdown

Stream Num.: 830_10.3L.1R
Stream Class: I, II, IV
Channel Type: MMO, HCO
Protection: Category A and C
Flagging: B/W, G/W
Buffer (RMA):
Class I for MMO: 120 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater
Class II for HCO: 100 feet or to the top of the side-slope break; whichever is greater
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 830_10.3L.1R.1L / 2.0
Stream Class: I, IV
Channel Type: HCO
Protection: Category A and C
Flagging: B/W, G/W
Buffer (RMA):
Class I for HCO: 100 feet or to the top of the side-slope break; whichever is greater
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: Map Location C-3 (830_10.3L.1R.2L)
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA): Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 830_10.3L.2R
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 830_10.3L.1L
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

All Streams Protection/Mitigation Actions by Category:
All Categories implement BMPs
Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and

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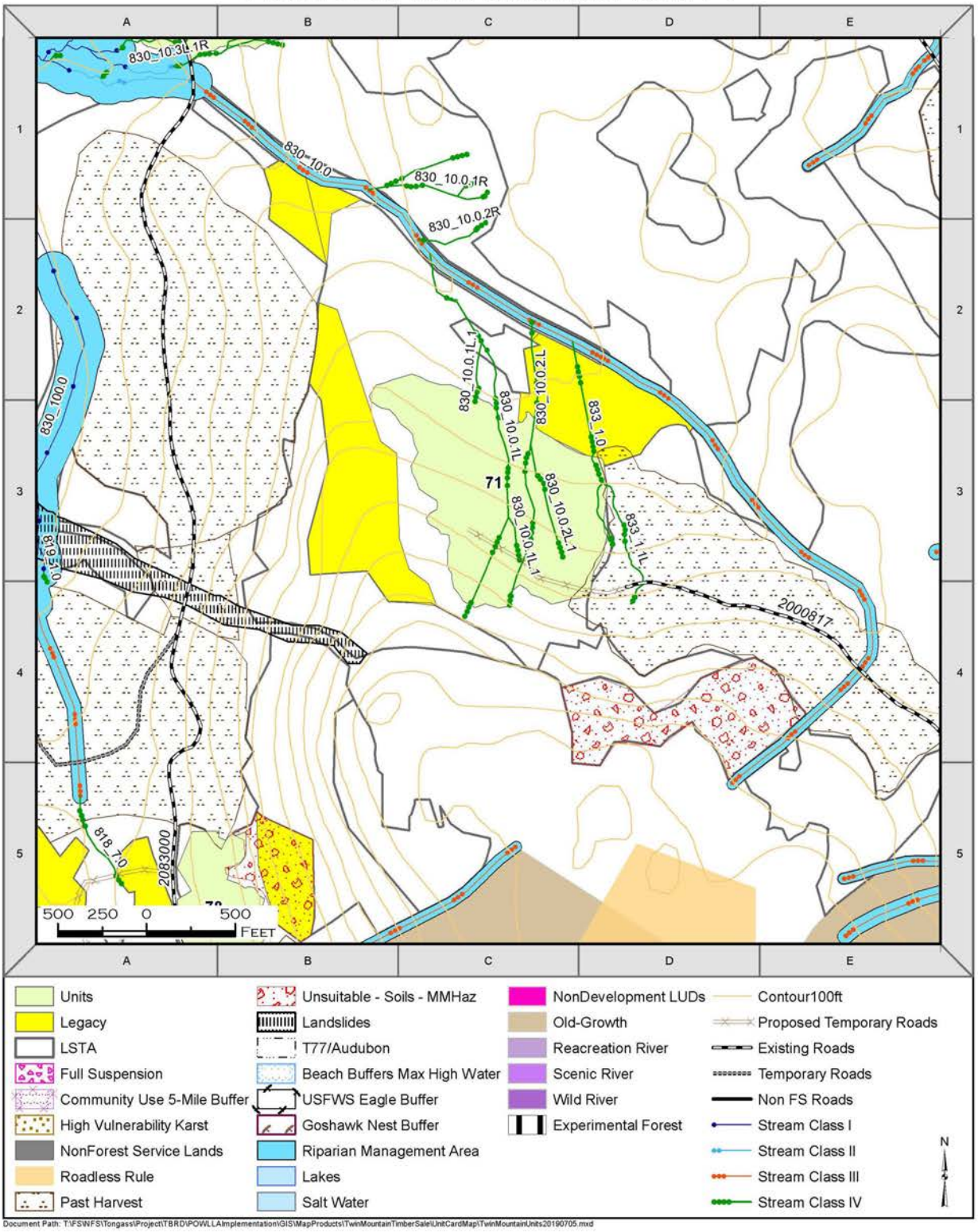
selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers. Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
No temporary roads planned. Should temporary road/stream crossings be needed, crossing structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3 and 14.5.
GEOLOGY/KARST
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes are less than 55%. All slopes are suitable for harvest with shovel yarding and should follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMPs 12.5 and 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4).
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 71



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Unit 71							
Unit Number:	71	**Total Harvest Unit Acres**	24	**Prescription:**	EA	**Harvest System:**	Cable
VCU Number:	5300	**LUD:**	Modified Landscape, Timber Production		**Net Harvest Volume (MBF):**		539

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock in the overstory with lesser amounts of spruce and cedar irregularly distributed throughout. Stand structure is variable, containing breaks in the canopy from tree mortality and windthrow where a variety of trees sizes are found, but also has areas of continuous canopy cover where overstory trees are well-stocked. Trees range in size from small seedlings to large diameter dominant overstory individuals. Snags and downed wood are distributed throughout. The understory is predominantly blueberry with lesser amounts of rusty menziesia and red huckleberry. Forbs commonly found in old-growth are distributed throughout but in varied densities. This stand is mature with light stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections in the overstory are light. The risk for windthrow in this stand is moderate due to its exposure to southerly winds coming off adjacent muskegs and past harvest, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. A RAW buffer along the Class III stream to the north of this unit was initially indicated but was determined to be unnecessary after field review by qualified specialists.

TIMBER/LOGGING

This unit is planned for a combination of uphill and downhill cable yarding to landings located along a proposed temporary road off of NFSR 2000817.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2000817 (BMP 14.20, Road-4, Road-7). New temporary road construction, 0.20 miles (BMPs 14.5, Road-3, Road-5, Road-6, Road-7).

BOTANY

No botany concerns.

INVASIVE SPECIES

No weeds are known from this area. To keep this area weed-free follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest. Specifically follow recommendations under Activity Cards 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, inspect all borrow pits before use and transport of rock to the units or new roads.

FISHERIES

Stream Num.: 833_1.0
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 833_1.1L
Stream Class: IV
Channel Type: HCO
Protection: Category C

Unit 71

Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 833_10.0.1L
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 833_10.0.1L.1
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: Map Location C-3 (833_10.0.1L.1R)
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 833_10.0.2.L
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

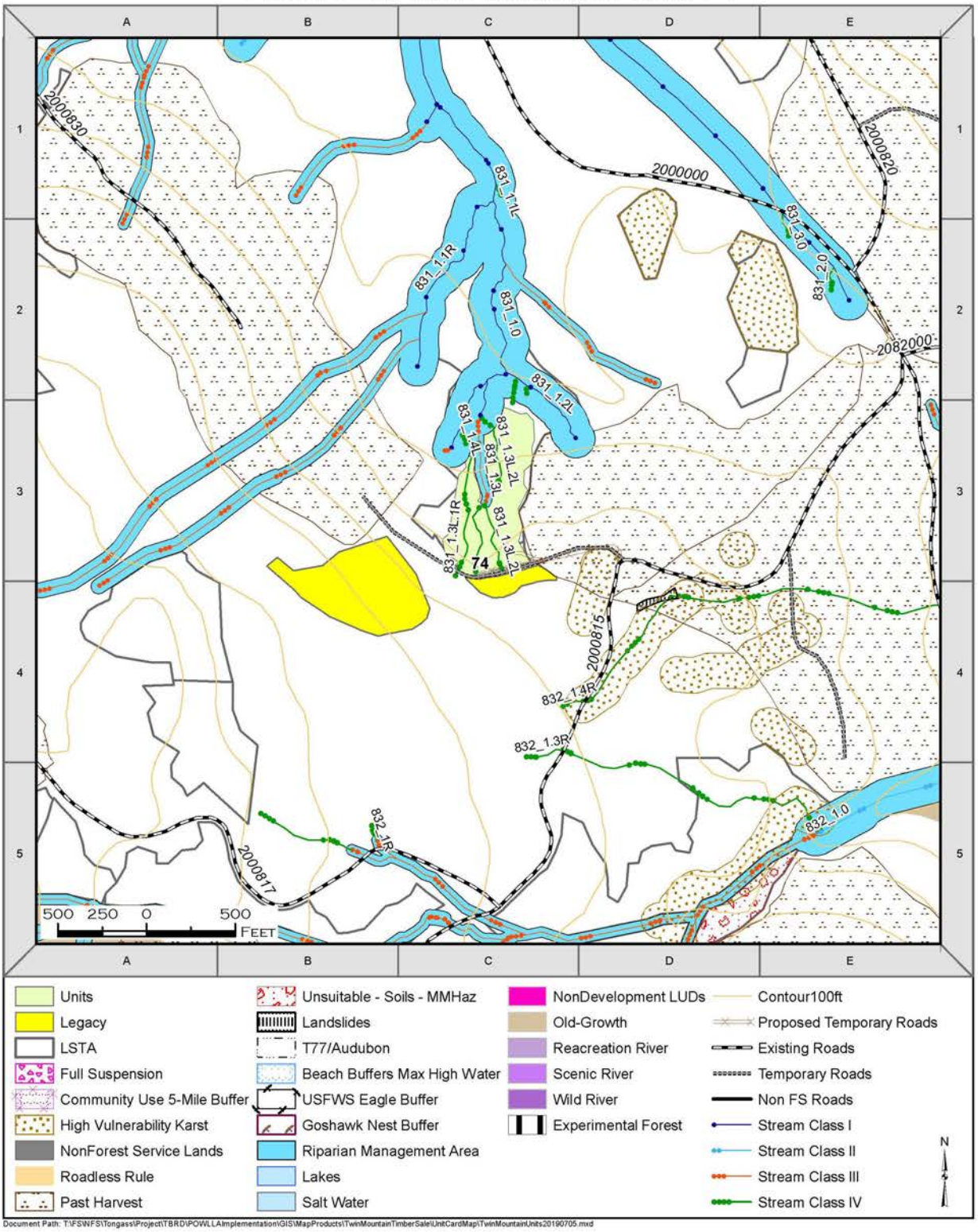
Stream Num.: 833_10.0.2L.1L
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

All Streams Protection/Mitigation Actions by Category:
All Categories implement BMPs
Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers.

Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers.

Unit 71
Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
There are six culverts being replaced or re-installed on NFS road 2000817 for Class IV streams, non-streams and cross drains. The temporary road to the unit has three Class IV crossings, with one outside of the unit. Should temporary road locations be changed such that different streams would be crossed, structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3, 14.5 and AqEco-4.
GEOLOGY/KARST
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes are greater than 72% in the southernmost portion of the unit with small cliffs. Slopes in the remainder of the unit are gentle up to 60% and become gentler in the northern portion. All slopes are suitable for harvest with a minimum of partial suspension with cable yarding and will meet soil and wetland resource concerns (R10 BMPS 12.5, 13.5, and 13.9 and National Core BMPs Plan-2, AqEco-2, AqEco-4, Veg-1, Veg-2, Veg-5, and Veg-6). The proposed temporary road does not cross any wetland. Follow R10 BMPs12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 74



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Unit 74							
Unit Number:	74	**Total Harvest Unit Acres**	7.1	**Prescription:**	EA	**Harvest System:**	Cable
VCU Number:	5300	**LUD:**	Modified Landscape		**Net Harvest Volume (MBF):**		160

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock with a strong component of yellow-cedar in the overstory, but also contains lesser amounts of spruce and redcedar. Stand structure is complex with breaks throughout the canopy from overstory mortality and variable soil drainage. Tree sizes cover a wide range and stocking ranges from moderate-to-well stocked. Yellow-cedar snags are common throughout, with lesser amounts of snags of different species. The understory layer is brushy, mainly blueberry but has a strong component of rusty menziesia, and is more evenly distributed throughout because of breaks in the canopy. Forbs commonly found in old-growth are distributed throughout. This stand is mature with moderate to heavy stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections in the overstory are light. The risk for windthrow in this stand is moderate due to its exposure to southeasterly winds coming off adjacent past harvest, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. RAW buffers along the Class I and III streams to the north of this unit were initially indicated but were determined to be unnecessary after field review by qualified specialists.

TIMBER/LOGGING

This unit is planned for uphill cable yarding to landings located along a proposed temporary road off of NFSR 2000815.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2000815 (BMP 14.20, Road-4, Road-7). New temporary road on existing prism 0.20 miles. (BMPs 14.5, Road-3, Road-6). New temporary road construction, 0.03 miles (BMPs 14.5, Road-3, Road-5, Road-6, Road-7).

BOTANY

No botany concerns.

INVASIVE SPECIES

Weeds are in the area of the unit along NFSR 2000815. Follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest, but specifically in 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, to reduce the risk of further introduction, inspect all borrow pits before use and transport of rock to the units or new roads. See Krosse 2017 for all BMP's.

FISHERIES

Stream Num.: 831_1.0
Stream Class: I, III
Channel Type: MMS, HCM
Protection: Category A and B
Flagging: B/W, O/W
Buffer (RMA):
Class I for MMS: 120 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater
Class I for HCM: 100 feet or to the top of the side-slope break; whichever is greater
Class III for HCM: 100 feet or to the top of the side-slope break; whichever is greater
Concerns: N/A

Unit 74

Stream Num.: 831_1.2L
Stream Class: I
Channel Type: MCS
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class I for MCS: 100 feet or to the top of the side-slope break; whichever is greater
Concerns: N/A

Stream Num.: Map Location C-3 (831_1.2L.1R)
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: Map Location C-3 (831_1.2L.2R)
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 831_1.3L
Stream Class: I, III, IV
Channel Type: HCM, HCO
Protection: Category A, B, and C
Flagging: B/W, O/W, G/W
Buffer (RMA):
Class I for HCM: 100 feet or to the top of the side-slope break; whichever is greater
Class III for HCM: To the top of the side-slope break
Class IV for HCO: No buffer
Concerns: N/A

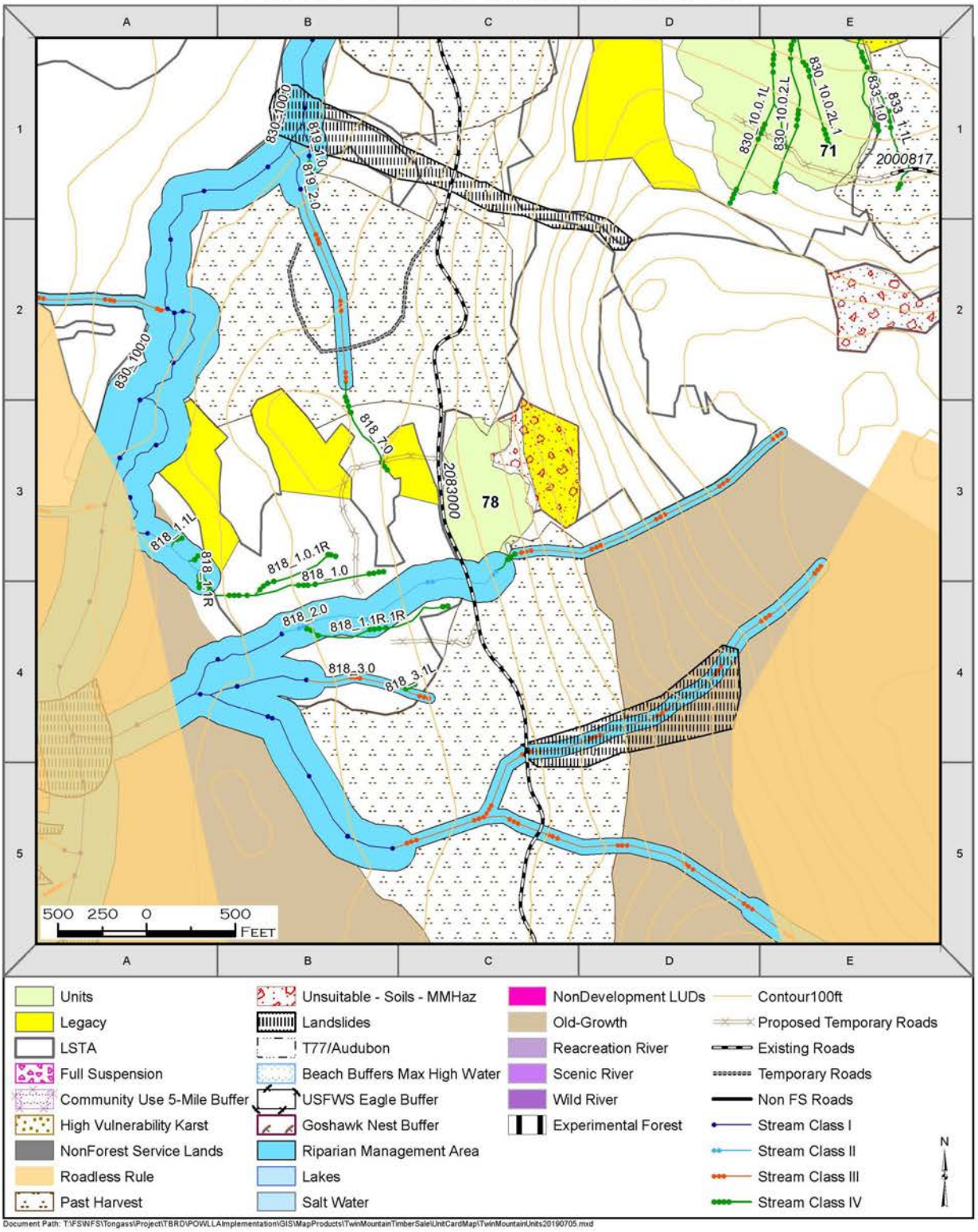
Stream Num.: 831_1.3L.1R
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: Map Location C-3 (831_1.3L.2L)
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: Two streams with the same name

Stream Num.: 831_1.3L.2L
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W

Unit 74
Buffer (RMA): Class IV for HCO: No buffer Concerns: Two streams with the same name Stream Num.: 831_1.4L Stream Class: IV Channel Type: HCO Protection: Category C Flagging: G/W Buffer (RMA): Class IV for HCO: No buffer Concerns: N/A
All Streams Protection/Mitigation Actions by Category: All Categories implement BMPs Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers. Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
There is no culvert work specified for the reconditioned NFS road accessing the unit. The temporary road to this unit is mostly reconstructed and calls for one non-stream crossing, likely outside of unit. Should temporary road locations be changed such that different streams would be crossed, structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3, 14.5 and AqEco-4.
GEOLOGY/KARST
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes are mostly gentle up to 55%. The soils and wetlands are suitable for a minimum of partial suspension cable yarding and should follow R10 BMPs 12.5, 13.2 and 13.9 and National Core BMPs Plan-2, Veg-2, Veg-4, Veg-5, and Veg-6. The proposed temporary road does not traverse any wetland. Follow R10 BMPs12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 78



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Unit 78							
Unit Number:	78	**Total Harvest Unit Acres**	6.9	**Prescription:**	EA	**Harvest System:**	Shovel
VCU Number:	5300	**LUD:**	Timber Production, Modified Landscape		**Net Harvest Volume (MBF):**		155

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by Sitka spruce in the overstory with lesser amounts of western hemlock unevenly distributed. Trees are typically large diameter and well stocked. The canopy is continuous, with few breaks, where breaks occur western hemlock regeneration is common. Snags are infrequent and unevenly distributed. The understory is comprised mainly of blueberry that is very unevenly distributed and in low amounts. Forbs are scarce and not a strong component of the understory. This stand is mature with light stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections in the overstory are moderate. The risk for windthrow in this stand is low.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. RAW buffers along the Class III streams within this unit were initially indicated but were determined to be unnecessary after field review by qualified specialists.

TIMBER/LOGGING

This unit is planned for shovel yarding to landings located along NFSR 2083000.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2083000 (BMP 14.20, Road-4, Road-7).

BOTANY

No restrictions for botany.

INVASIVE SPECIES

Weeds are in the area of the unit along NFSR road 2083000. Follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest, but specifically in 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, to reduce the risk of further introduction, inspect all borrow pits before use and transport of rock to the units or new roads. See Krosse 2017 for all BMP's.

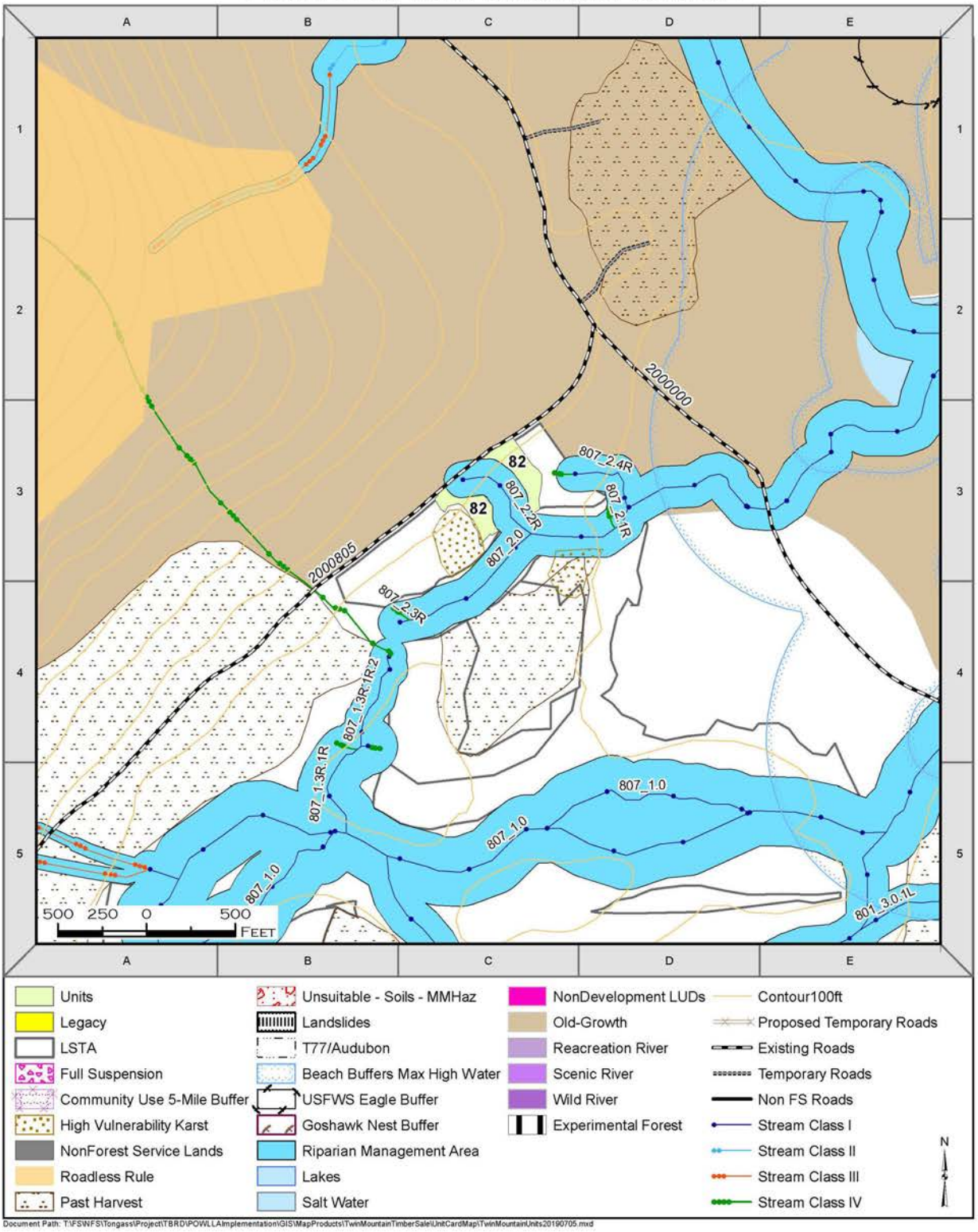
FISHERIES

Stream Num.: 818_2.0
Stream Class: II, IV
Channel Type: HCM, HCO, HCLw
Protection: Category A and C
Flagging: B/W, G/W
Buffer (RMA):
Class I for MMO: 120 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater
Class II for HCM: 100 feet or to the top of the side-slope break; whichever is greater
Class IV for HCO: No buffer
Class IV for HCLw: No buffer
Concerns: Upper reach of 818_2.0 incorrectly mapped as Class III

All Streams Protection/Mitigation Actions by Category:
All Categories implement BMPs
Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers.

Unit 78
Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
There is no culvert work specified for the reconditioned NFS road accessing the unit. No temporary roads planned. Should temporary road/stream crossings be needed, crossing structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3, 14.5, and AqEco-4.
GEOLOGY/KARST
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes are mostly gentle in the western polygon. Slopes range from 40% to greater than 72% in the eastern polygon. Approximately 5 acres were excluded in the eastern polygon due to landslides, steep slopes, and boulder colluvium in the easternmost portion of the unit. All soils and wetlands are suitable for partial suspension cable yarding and shovel yarding (R10 BMPS 12.5, 13.5, and 13.9 and National Core BMPs Plan-2, AqEco-2, AqEco-4, Veg-1, Veg-2, Veg-5, and Veg-6). Follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMP 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). Forested wetlands are present along the eastern and western boundaries of the western polygon (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4).
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected. This area functions as an elevational corridor. Sharp-shinned hawks were detected in this unit in 2018 and 2019 and received a 600 foot buffer.

POW LLA Twin Mountain Unit 82



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Unit 82							
Unit Number:	82	**Total Harvest Unit Acres**	2.3	**Prescription:**	EA	**Harvest System:**	Shovel
VCU Number:	5330	**LUD:**	Modified Landscape, Timber Production		**Net Harvest Volume (MBF):**		51

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock in the overstory with lesser amounts of spruce and cedar irregularly distributed throughout. Stand structure is variable, containing breaks in the canopy from tree mortality and windthrow where a variety of trees sizes are found, but also has areas of continuous canopy cover where overstory trees are well-stocked. Trees range in size from small seedlings to large diameter dominant overstory individuals. Snags and downed wood are distributed throughout. The understory is predominantly blueberry with lesser amounts of rusty menziesia and red huckleberry. Forbs commonly found in old-growth are distributed throughout but in varied densities. This stand is mature with moderate to heavy stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections in the overstory are heavy. The risk for windthrow in this stand is high due to its exposure to winds coming off nearby muskegs to the southeast and proximity to Red Bay, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. No concerns were identified in this unit that would require a review for a RAW buffer.

TIMBER/LOGGING

This unit is planned for shovel yarding to landings located along NFSR 2000805.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2000805 (BMP 14.20, Road-4, Road-7).

BOTANY

No botany concerns.

INVASIVE SPECIES

Weeds are in the area of the unit. Follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest, but specifically in 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, to reduce the risk of further introduction, inspect all borrow pits before use and transport of rock to the units or new roads. See Krosse 2017 for all BMP's.

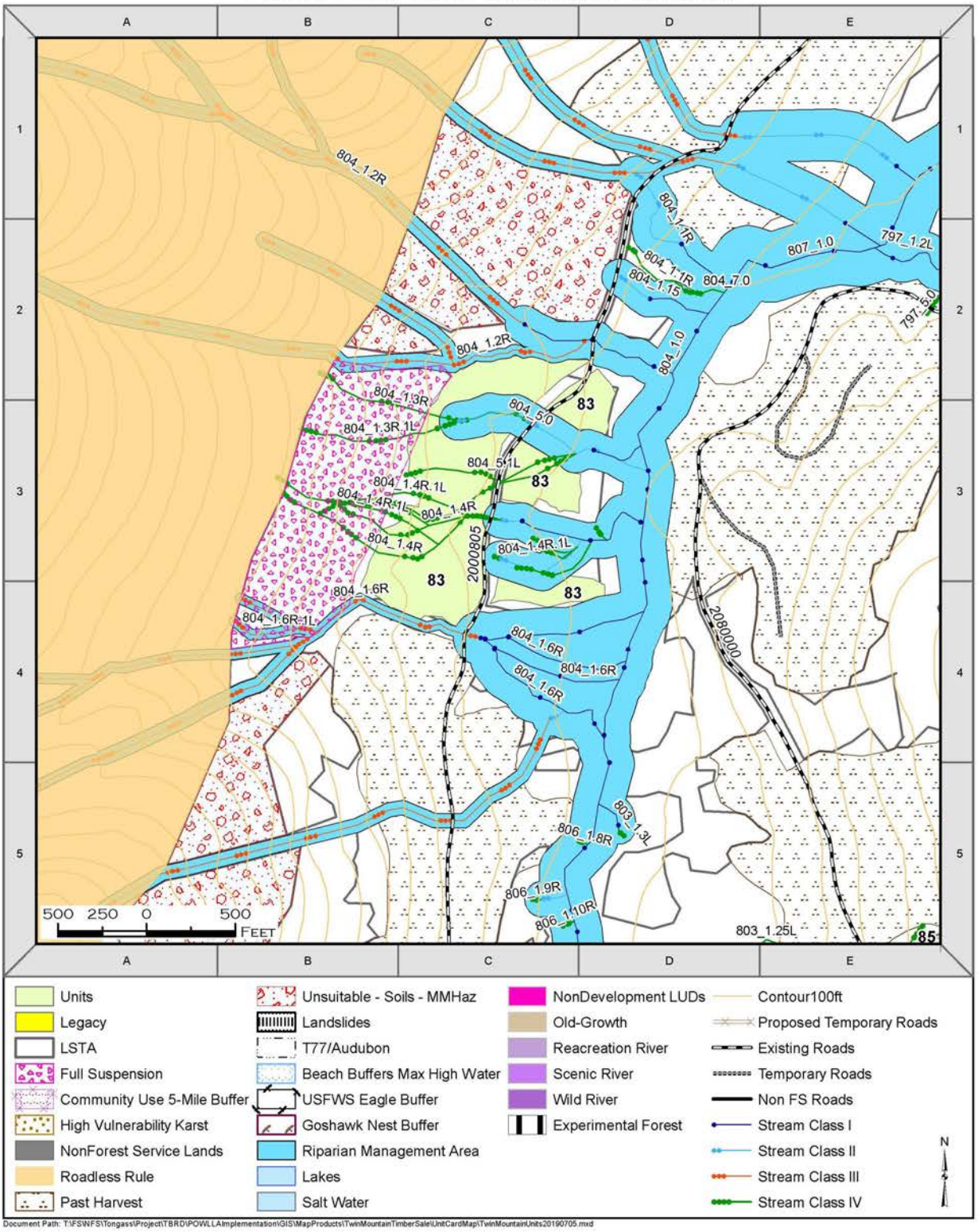
FISHERIES

Stream Num.: 807_2.0
Stream Class: I
Channel Type: PAB
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class I for PAB: 100 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater
Concerns: N/A

Stream Num.: 807_2.2R
Stream Class: I
Channel Type: MMO, HCO
Protection: Category A
Flagging: B/W
Buffer (RMA):

Unit 82
Class I for MMO: 120 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater Class I for HCO: 100 feet or to the top of the side-slope break; whichever is greater Concerns: N/A Stream Num.: 807_2.4R Stream Class: I, IV Channel Type: MMO Protection: Category A and C Flagging: B/W, G/W Buffer (RMA): Class I for MMO: 120 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater Class IV for MMO: No buffer Concerns: N/A
All Streams Protection/Mitigation Actions by Category: All Categories implement BMPs Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers. Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
No temporary roads planned. Should temporary road/stream crossings be needed, crossing structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3 and 14.5.
GEOLOGY/KARST
Unit has been reviewed for karst and cave resources. Most of the unit is underlain by moderate vulnerability karst with two inclusions of high vulnerability surrounding discrete karst features. No harvest buffers have been flagged surrounding these karst features, the unit as laid out reflects these areas. A harvest method that obtains partial suspension is required on the moderate vulnerability karst.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes are less than 35%. The soils and wetlands are suitable for shovel yarding. Follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMP 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4).
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected. This unit is adjacent to OGR.

POW LLA Twin Mountain Unit 83



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Unit 83							
Unit Number:	83	**Total Harvest Unit Acres**	23.4	**Prescription:**	EA	**Harvest System:**	Shovel
VCU Number:	5330	**LUD:**	Timber Production, Modified Landscape		**Net Harvest Volume (MBF):**		524

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock in the overstory with lesser amounts of spruce and cedar irregularly distributed throughout. Stand structure is variable, containing breaks in the canopy from tree mortality and windthrow where a variety of trees sizes are found, but also has areas of continuous canopy cover where overstory trees are well-stocked. Trees range in size from small seedlings to large diameter dominant overstory individuals. Snags and downed wood are distributed throughout. The understory is predominantly blueberry with lesser amounts of rusty menziesia and red huckleberry. Forbs commonly found in old-growth are distributed throughout but in varied densities. This stand is mature with moderate stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections in the overstory are moderate. The risk for windthrow in this stand is moderate due to its exposure to southerly winds coming off adjacent past harvest, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. This unit may require a RAW review; need for a buffer would be evaluated prior to implementation.

TIMBER/LOGGING

This unit is planned for shovel yarding to landings located along NFSR 2000805.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2000805 (BMP 14.20, Road-4, Road-7).

BOTANY

No restrictions for botany.

INVASIVE SPECIES

No weeds are known from this area in GIS, but no recent surveys were conducted. To keep this area weed-free follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest. Specifically follow recommendations under Activity Cards 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly inspect all borrow pits before use and transport of rock to the units or new roads.

FISHERIES

Stream Num.: 804_1.0 / Big Creek
Stream Class: I
Channel Type: MMM
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class I for MMM: 120 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater
Concerns: N/A

Stream Num.: 804_1.2R (Map Location C-2 / B-1)
Stream Class: I, III
Channel Type: HCM, HCD
Protection: Category A and B
Flagging: B/W, O/W
Buffer (RMA):

Unit 83

Class I for HCM: 100 feet or to the top of the side-slope break; whichever is greater
Class III for HCM: To the top of the side-slope break
Class III for HCD: To the top of the side-slope break
Concerns: Blowdown

Stream Num.: 804_1.2R (Map Location C-2 / B-2)
Stream Class: III
Channel Type: HCD
Protection: Category B
Flagging: O/W
Buffer (RMA):
Class III for HCD: To the top of the side-slope break
Concerns: N/A

Stream Num.: Map Location C-2 / B-2 (804_1.2R.1L)
Stream Class: III
Channel Type: HCM, HCD
Protection: Category B
Flagging: O/W
Buffer (RMA):
Class III for HCM: To the top of the side-slope break
Class III for HCD: To the top of the side-slope break
Concerns: N/A

Stream Num.: 804_5.0 / 804_1.3R
Stream Class: I, II, IV
Channel Type: AFO, HCL, HCO
Protection: Category A and C
Flagging: B/W, G/W
Buffer (RMA):
Class I for AFO: 140 feet or within the active portion of the alluvial fan; whichever is greater
Class I for HCL: 100 feet or to the top of the side-slope break; whichever is greater
Class II for HCL: 100 feet or to the top of the side-slope break; whichever is greater
Class IV for HCO: No buffer
Concerns: Blowdown

Stream Num.: Map Location C-3 / B-3 (804_1.3R.1L)
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: Two streams with the same name

Stream Num.: 804_5.1L
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: Blowdown

Stream Num.: 804_1.4R
Stream Class: I, II, IV
Channel Type: MMO, HCO
Protection: Category A and B
Flagging: B/W, O/W
Buffer (RMA):

Unit 83

Class I for MMO: 120 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater
Class II for HCO: 100 feet or to the top of the side-slope break; whichever is greater
Class IV with Category B protection for HCO: To the top of the side-slope break
Concerns: Class IV HCO gets category B protection

Stream Num.: 804_1.4R.1L
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: Two streams with the same name

Stream Num.: Map Location C-3 / B-3 (804_1.4R.1L)
Stream Class: II, IV
Channel Type: HCO
Protection: Category A and B
Flagging: B/W, O/W
Buffer (RMA):
Class II for HCO: 100 feet or to the top of the side-slope break; whichever is greater
Class IV for HCO: To the top of the side-slope break
Concerns: Class IV HCO gets category B protection

Stream Num.: Map Location C-3 (804_1.4R.1L.1R)
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

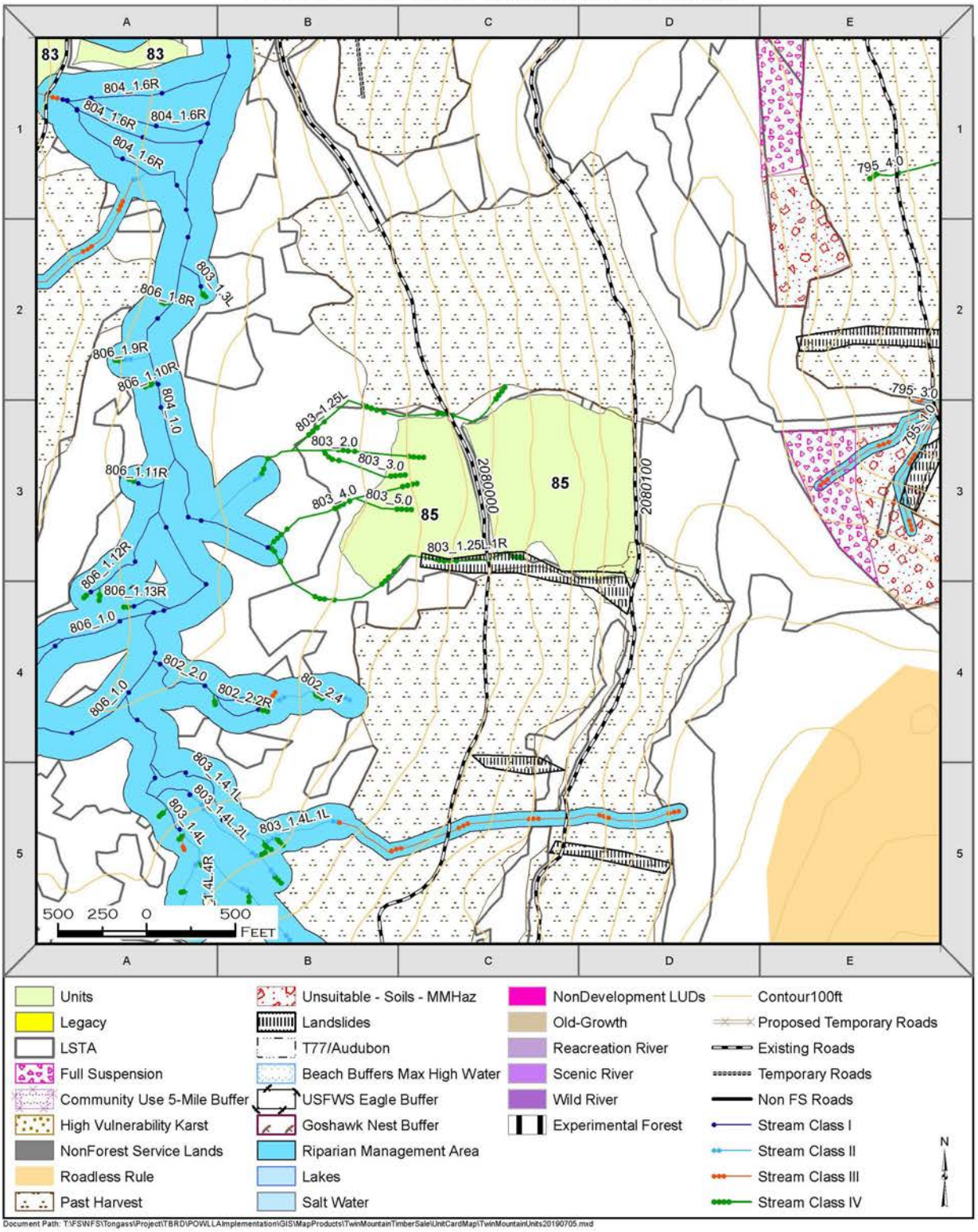
Stream Num.: Map Location C-3 (804_1.4R.1R)
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: Map Location C-3 / B-3 (804_1.4R.2L)
Stream Class: IV
Channel Type: HCO
Protection: Category B
Flagging: O/W
Buffer (RMA):
Class IV with Category B protection for HCO: To the top of the side-slope break
Concerns: Class IV HCO gets category B protection

Stream Num.: 804_1.6R
Stream Class: I, III
Channel Type: AFM, HCM
Protection: Category A and C
Flagging: B/W, O/W
Buffer (RMA):
Class I for AFM: 140 feet or within the active portion of the alluvial fan; whichever is greater
Class III for HCM: to the top of the side-slope break
Concerns: N/A

Unit 83
During the GIS process some streams were not removed from the corporate layer and were not included in the unit card text.
All Streams Protection/Mitigation Actions by Category: All Categories implement BMPs Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers. Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
This unit is accessed by NFS road 2000805 which has 15 stream crossing re-installations as part of the reconstruction. There is a Class I bridge crossing at MP 1.44 a Class II crossing at MP 1.56 that needs to also be a bridge and a Class II/Class III (fish downslope of stream) that all need Title 16 concurrences and have installation timing restrictions. Four Class III crossings and eight Class IV, ditch relief or non-stream crossings will also be re-installed on this road (AqEco-4). There are no temporary roads planned. Should temporary road/stream crossings be needed, crossing structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3 and 14.5.
GEOLOGY/KARST
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes range from 35-70%. Approximately 24 acres were excluded in the northern polygon due to landslides, slumps, and steep slopes. Approximately 23 acres are suitable for harvest with full suspension in the western portion of the southern polygon and should follow R10 BMPS 12.5, 13.5, and 13.9 and National Core BMPs Plan-2, AqEco-2, AqEco-4, Veg-1, Veg-2, and Veg-5. The remainder of the unit is suitable for shovel yarding and should follow the shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMPs 12.5 and 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4).
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 85



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Unit 85							
Unit Number:	85	**Total Harvest Unit Acres**	28.7	**Prescription:**	EA	**Harvest System:**	Shovel, Cable
VCU Number:	5330	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		644

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock with a strong component of yellow-cedar in the overstory, but also contains lesser amounts of spruce and redcedar. Stand structure is complex with breaks throughout the canopy from overstory mortality and variable soil drainage. Tree sizes cover a wide range and stocking ranges from moderate-to-well stocked. Yellow-cedar snags are common throughout, with lesser amounts of snags of different species. The understory layer is brushy, mainly blueberry but has a strong component of rusty menziesia, and is more evenly distributed throughout because of breaks in the canopy. Forbs commonly found in old-growth are distributed throughout. This stand is mature with moderate stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections in the overstory are light. The risk for windthrow in this stand is high due to its exposure to northerly winds coming off adjacent past harvest, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. No concerns were identified in this unit that would require a review for a RAW buffer.

TIMBER/LOGGING

This unit is planned for a combination of shovel and downhill cable yarding to landings located along NFSR 2080000.

ENGINEERING/SYSTEM ROADS

Access via existing NFS roads 2080000 and 2080100 (BMP 14.20, Road-4, Road-7).

BOTANY

No restrictions for botany.

INVASIVE SPECIES

No weeds are known from this area in GIS, but no recent surveys were conducted. To keep this area weed-free follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest. Specifically follow recommendations under Activity Cards 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly inspect all borrow pits before use and transport of rock to the units or new roads.

FISHERIES

Stream Num.: 803_1.25L
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 803_1.25L.1R
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):

Unit 85

Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 803_2.0
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 803_3.0
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 803_4.0
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 803_5.0
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

All Streams Protection/Mitigation Actions by Category:
All Categories implement BMPs
Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers.

Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers.

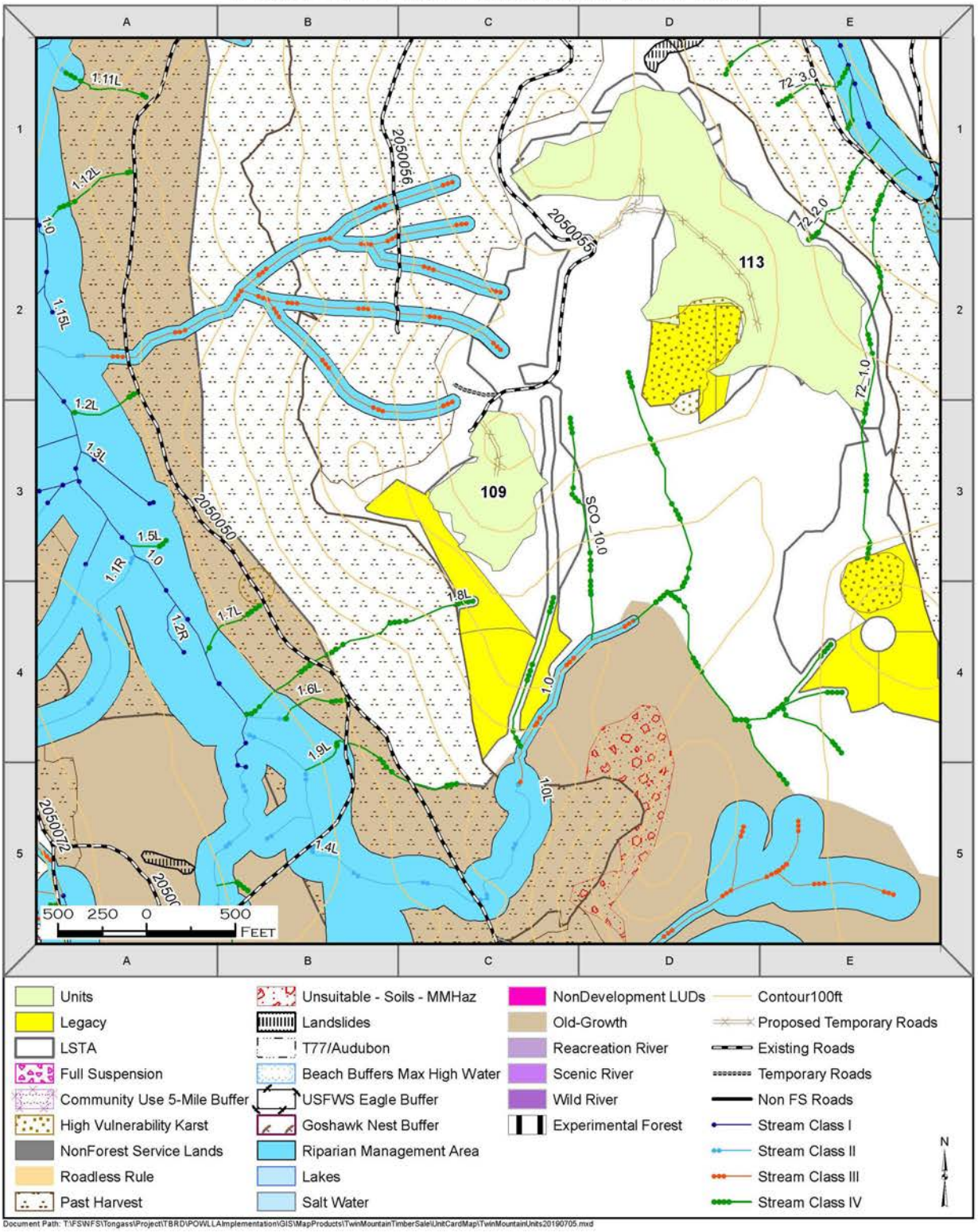
Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.

ROAD/STREAM CROSSING SUMMARY

Two NFS roads are being reconditioned to access this unit. The 208000 calls for two class IV crossings and one non-stream or ditch relief to be reinstalled. The 2080100 calls for eight cross drains, non-stream or Class IV crossings (AqEco-4). There are no temporary roads planned for this unit. Should temporary road/stream crossings be needed, crossing structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3 and 14.5.

Unit 85
GEOLOGY/KARST
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS
Slopes are gentle in the western polygon. Slopes range from 35-60% in the eastern polygon between the 2080 and 2080100 roads. A landslide is present just outside of the southern boundary of the eastern polygon. Slopes in the eastern polygon are suitable for harvest with a minimum of partial suspension with cable yarding and will meet soil and wetland resource concerns (R10 BMPS 12.5, 13.5, and 13.9 and National Core BMPs Plan-2, AqEco-2, AqEco-4, Veg-1, Veg-2, Veg-5, and Veg-6). All other slopes in the western polygon are suitable for shovel yarding. Follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMP 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). Forested wetlands are intermixed with upland throughout the western polygon (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4).
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 109



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Unit 109							
Unit Number:	109	**Total Harvest Unit Acres**	7.9	**Prescription:**	EA	**Harvest System:**	Shovel, Cable
VCU Number:	5900	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		176

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock with a strong component of yellow-cedar in the overstory, but also contains lesser amounts of spruce and redcedar. Stand structure is complex with breaks throughout the canopy from overstory mortality and variable soil drainage. Tree sizes cover a wide range and stocking ranges from moderate-to-well stocked. This stand is mature with moderate stem decay and defect resulting in a situation where stand growth is being offset by decay. Yellow-cedar snags are common throughout, with lesser amounts of snags of different species. The understory layer is brushy, mainly blueberry but has a strong component of rusty menziesia, and is more evenly distributed throughout because of breaks in the canopy. Forbs commonly found in old-growth are distributed throughout. This stand has varying levels of disease and decay throughout, ranging from light to heavy, with an active hemlock sawfly infestation in the stand. Mistletoe infections are not noted. The risk for windthrow in this stand is moderate due to its position as a high elevation stand and its high exposure to wind events, and existing stand and site characteristics. Yellow-cedar decline is occurring in the stand and was rated as moderate, with poor productivity.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guidelines or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. Because the potential opening of the planned harvest unit was greater than 20 acres in size, legacy is designated for retention to meet this requirement (Forest Plan, page 4-68). A RAW review was initially indicated for this unit, but no areas of concern were found and additional buffering was determined to be unnecessary after field review by a team of specialists.

TIMBER/LOGGING

This unit is planned for a combination of shovel and uphill cable yarding to landings located along a proposed temporary road off of NFSR 2050055.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2050055 (BMP 14.20, Road-4, Road-6). New temporary road construction, 0.08 miles (BMPs 14.5, Road-3, Road-5, Road-6).

BOTANY

No restrictions for botany.

INVASIVE SPECIES

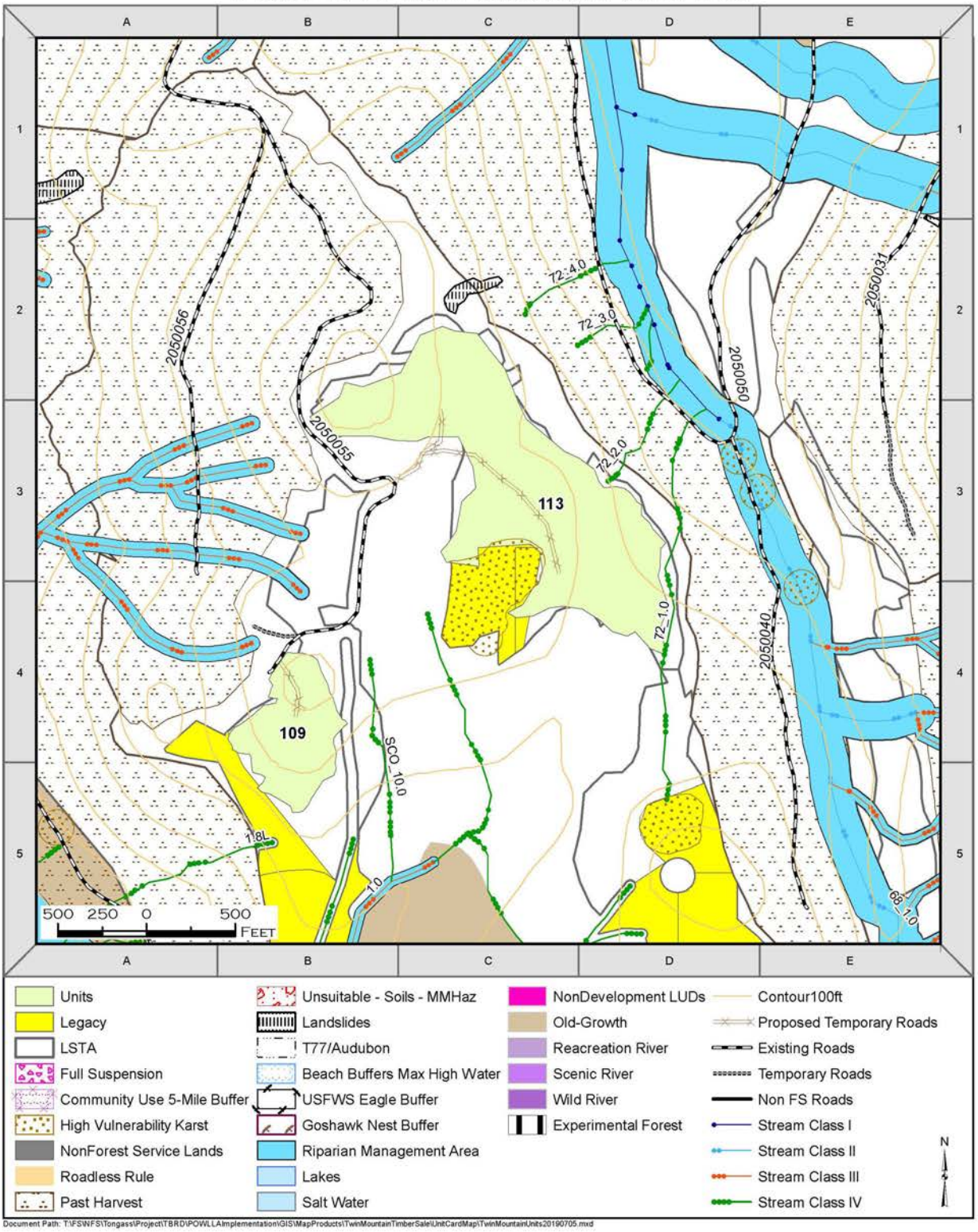
No weeds are known from this area in GIS, but no recent surveys were conducted. To keep this area weed-free follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest. Specifically follow recommendations under Activity Cards 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly inspect all borrow pits before use and transport of rock to the units or new roads.

FISHERIES

Stream Num.: Map Location D-2 / D-3 (SCO_10.0)
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Unit 109
Stream Num.: Map Location C-3 Stream Class: III Channel Type: HCD Protection: Category B Flagging: O/W Buffer (RMA): Class III for HCD: To the top of the side-slope break Concerns: N/A
All Streams Protection/Mitigation Actions by Category: All Categories implement BMPs Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers. Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
No culvert work specified for road reconditioning on NFS 2050055, or for the temporary road accessing unit. Should temporary road locations be changed such that different streams would be crossed, structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3, 14.5 and AqEco-4.
GEOLOGY/KARST
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes range from 45 to >72%. There is about a 0.5 acre area of slopes > 72% located in the middle of the unit that is suitable for harvest with partial suspension. All soils and wetlands are suitable for cable yarding with a minimum of partial suspension and shovel yarding (R10 BMP 13.9 and National Core BMPs Plan-2, Veg-2, Veg-4, Veg-5, and Veg-6). The proposed temporary road does not traverse any wetland. Follow R10 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 113



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Unit 113							
Unit Number:	113	**Total Harvest Unit Acres**	31.2	**Prescription**	EA	**Harvest System:**	Shovel, Cable
VCU Number:	5900	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		699

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock in the overstory with lesser amounts of spruce and cedar irregularly distributed throughout. Stand structure is variable, containing breaks in the canopy from tree mortality and windthrow where a variety of trees sizes are found, but also has areas of continuous canopy cover where overstory trees are well-stocked. Trees range in size from small seedlings to large diameter dominant overstory individuals. Snags and downed wooded are distributed throughout. The understory is predominantly blueberry with lesser amounts of rusty menziesia and red huckleberry. Forbs commonly found in old-growth are distributed throughout in varied densities.

This stand has moderate levels of physical defect and stem decay. Mistletoe infections are light. The risk for windthrow in this stand is moderate.

The desired condition for this stand is a highly productive, healthy, windfirm, stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

This stand is mature with moderate stem decay and defect resulting in a situation where stand growth is being offset by decay. Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. Because the potential opening of the planned harvest unit was greater than 20 acres in size, legacy is designated for retention to meet this requirement (Forest Plan, page 4-68). RAW buffers were initially indicated but no streams of concern were located within the unit, and so additional buffers were determined to be unnecessary after field review by qualified specialists.

TIMBER/LOGGING

This unit is planned for a combination of shovel and uphill cable yarding to landings located along a proposed temporary road off of NFSR 2050055.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2050055 (BMP 14.20, Road-4, Road-6). New temporary road construction, 0.32 miles (BMPs 14.5, Road-3, Road-5, Road-6).

BOTANY

No botany concerns.

INVASIVE SPECIES

No weeds are known from this area. To keep this area weed-free follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest. Specifically follow recommendations under Activity Cards 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly inspect all borrow pits before use and transport of rock to the units or new roads.

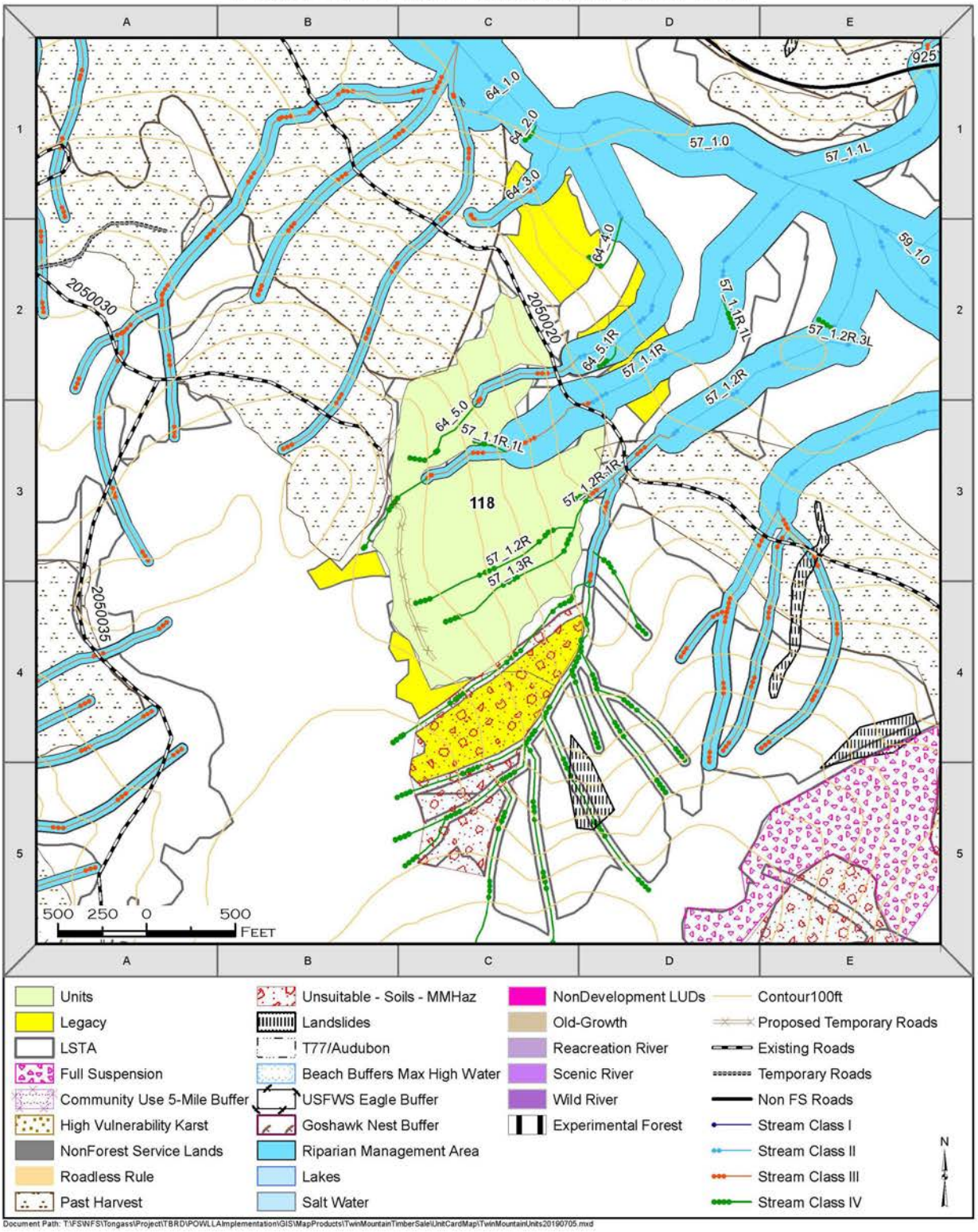
FISHERIES

Stream Num.: Map Location D-2 / D-3 / D-4 (72_1.0)
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: Not on map

Stream Num.: Map Location D-3 / C-3 72_2.0

Unit 113
Stream Class: IV Channel Type: HCO Protection: Category C Flagging: G/W Buffer (RMA): Class IV for HCO: No buffer Concerns: N/A
All Streams Protection/Mitigation Actions by Category: All Categories implement BMPs Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers. Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
No culvert work specified for the reconditioning of NFS road 2050055. Five culverts are specified for the temporary road for a Class IV and non-stream crossings. Should temporary road locations be changed such that different streams would be crossed, structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3, 14.5 and AqEco-4.
GEOLOGY/KARST
Unit has been reviewed for karst and cave resources. Two areas of the unit are underlain by karst, the karst was determined to be of low-moderate vulnerability with inclusions of high vulnerability surrounding discrete karst features. The high vulnerability karst areas have been excluded from the unit. A harvest method that obtains partial suspension is required on the moderate vulnerability karst.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes range from gentle to 55%. The soils and wetlands are suitable for shovel and cable yarding with a minimum of partial suspension (R10 BMP 13.9 and National Core BMPs Plan-2, Veg-2, Veg-4, Veg-5, and Veg-6). Follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMP 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). Forested wetland is intermixed with upland and forested wetland/ emergent short sedge throughout the unit and is more dominant along the western boundaries (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4). The proposed temporary road traverses about 0.25 acres of forested wetland/emergent short sedge in the unit and crosses about 0.5 acres outside of the unit. Wetland avoidance was not feasible due to existing road, terrain, and abundance of wetland. Follow R10 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
Goshawk surveys were completed in 2017; no goshawks were detected.

POW LLA Twin Mountain Unit 118



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Unit 118							
Unit Number:	118	**Total Harvest Unit Acres**	37.7	**Prescription:**	EA	**Harvest System:**	Cable
VCU Number:	5900	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		845

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock with a strong component of yellow-cedar in the overstory, but also contains lesser amounts of spruce and redcedar. Stand structure is complex with breaks throughout the canopy from overstory mortality and variable soil drainage. Tree sizes cover a wide range and stocking ranges from moderate-to-well stocked. Yellow-cedar snags are common throughout, with lesser amounts of snags of different species. The understory layer is brushy, mainly blueberry but has a strong component of rusty menziesia, and is more evenly distributed throughout because of breaks in the canopy. Forbs commonly found in old-growth are distributed throughout. This stand has varying levels of disease and decay throughout, ranging from light to heavy. Mistletoe infections are moderate but variable within the stand. The risk for windthrow in this stand is moderate due to its heavy exposure to southeasterly winds, with current windthrown trees from the southeastern direction, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guidelines or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. Because the potential opening of the planned harvest unit was greater than 20 acres in size, legacy is designated for retention to meet this requirement (Forest Plan, page 4-68). A RAW review occurred for this unit but an additional buffer was determined to be unnecessary after field review by a team of specialists.

TIMBER/LOGGING

This unit is planned for a combination of uphill and downhill cable yarding to landings located along NFSR 2050020 and a proposed temporary road off of NFSR 2050030.

ENGINEERING/SYSTEM ROADS

Access via existing NFS roads 20500020 and 2050030 (BMP 14.20, Road-4, Road-6). New temporary road construction, 0.28 miles (BMPs 14.5, Road-3, Road-5, Road-6).

BOTANY

No botany concerns.

INVASIVE SPECIES

No weeds are known from this area. To keep this area weed-free follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest. Specifically follow recommendations under Activity Cards 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly inspect all borrow pits before use and transport of rock to the units or new roads.

FISHERIES

Stream Num.: 64_5.0
Stream Class: II, III
Channel Type: HCO, HCM
Protection: Category A and B
Flagging: B/W, O/W
Buffer (RMA):
Class II for HCO: 100 feet or to the top of the side-slope break, whichever is greater
Class III for HCM: To the top of the side-slope break
Concerns: N/A

Stream Num.: 57_1.1R

Unit 118

Stream Class: II, III, IV
Channel Type: AFH. HCO, HCM, HCD
Protection: Category B and C
Flagging: B/W, O/W, G/W
Buffer (RMA):
Class II for HCO: 100 feet or to the top of the side-slope break, whichever is greater
Class III for AFH: 140 feet or within the active portion of the alluvial fan; whichever is greater
Class III for HCM: To the top of the side-slope break
Class III for HCD: To the top of the side-slope break
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 57_1.1R.1L
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 57_1.2R
Stream Class: III, IV
Channel Type: HCO,HCM
Protection: Category A and C
Flagging: B/W, G/W
Buffer (RMA):
Class III for HCM: To the top of the side-slope break, whichever is greater
Class IV for HCO: No buffer
Concerns: Two streams with same stream number.

Stream Num.: Map Location D-4 (57_1.2R.1L)
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 57_1.2R (57_1.2R.1R)
Stream Class: III, IV
Channel Type: HCO, HCM
Protection: Category B, C
Flagging: O/W, G/W
Buffer (RMA):
Class III for HCM: To the top of the side-slope break
Class IV for HCO: No buffer
Concerns: N/A

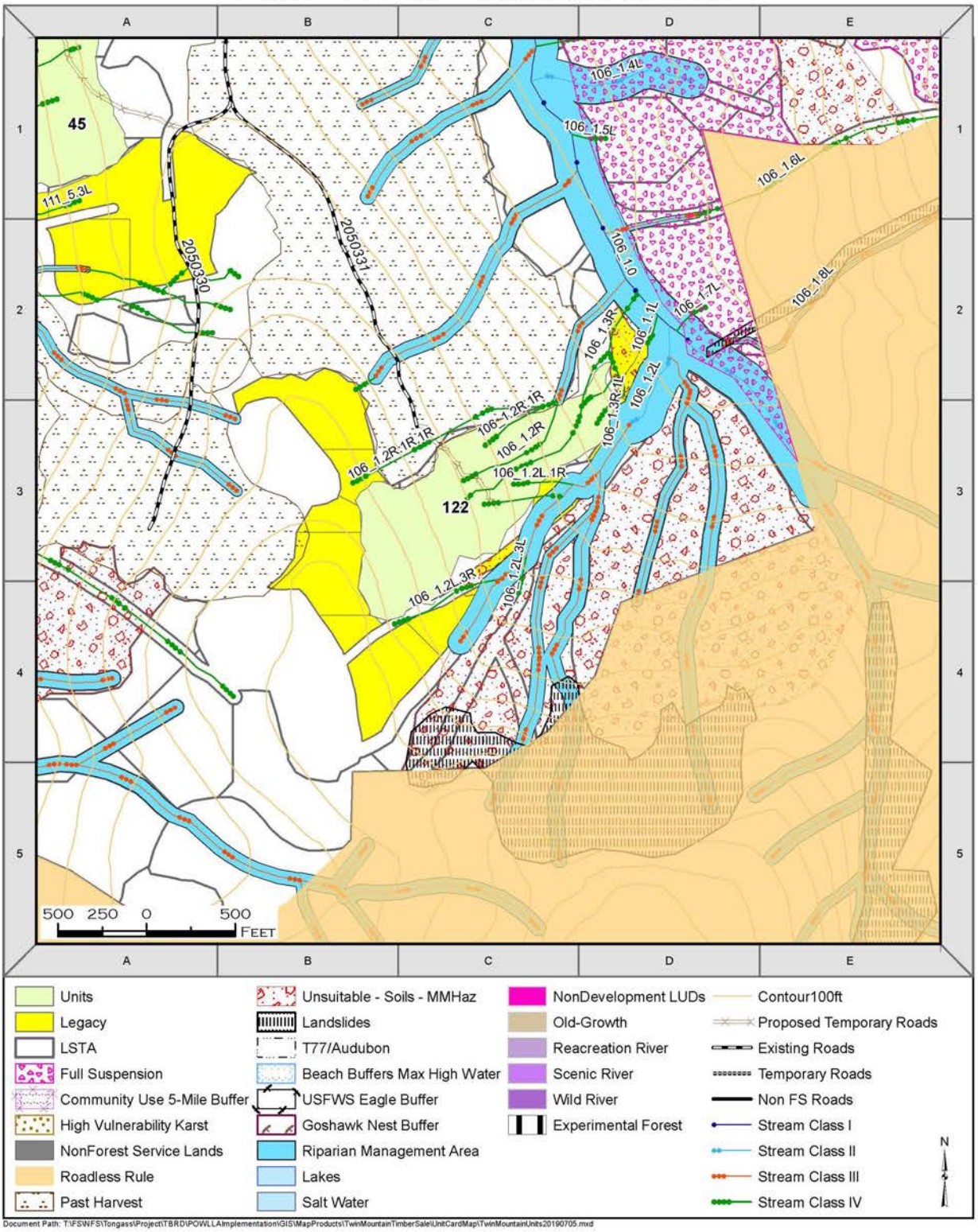
Stream Num.: 57_1.3R (57_1.2R.1R.1L)
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: Map Location C-3 (57_1.2R.1R.1R)
Stream Class: IV

Unit 118
Channel Type: HCO Protection: Category C Flagging: G/W Buffer (RMA): Class IV for HCO: No buffer Concerns: N/A Stream Num.: Map Location D-3 (57_1.2R.2L) Stream Class: IV Channel Type: HCO Protection: Category C Flagging: G/W Buffer (RMA): Class IV for HCO: No buffer Concerns: N/A Stream Num.: Map Location D-4 Stream Class: IV Channel Type: HCO Protection: Category C Flagging: G/W Buffer (RMA): Class IV for HCO: No buffer Concerns: N/A
All Streams Protection/Mitigation Actions by Category: All Categories implement BMPs Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers. Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
There is one crossing with a Class II stream below it that requires Title 16 concurrence and timing restrictions for construction at mile post 0.07, three Class III crossings and 10 Class IV or non-stream crossings being installed or re-installed on the reconditioned NFS road 2050020. There are three Class IV or non-stream crossings on the temporary road accessing this unit. Culverts at mileposts 0.82 and 0.83 shall be removed immediately following operations to avoid failure. Should temporary road locations be changed such that different streams would be crossed, structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3, 14.5 and AqEco-4.
GEOLOGY/KARST
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.

Unit 118
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes average 55% throughout the unit with a 2 acre area of slopes >72% located adjacent to the northwest boundary. Approximately 16 acres were excluded in the southern polygon due to landslides, cliffs, and steep slopes with wet intermixed glacial till. All slopes within the unit boundary are suitable for cable harvest with a minimum of partial suspension (R10 BMPs 12.5, 13.5, and 13.9 and National Core BMPs Plan-2, AqEco-2, AqEco-4, Veg-1, Veg-2, Veg-5, and Veg-6). The proposed temporary road traverses about 0.1 acres of emergent short sedge. Wetland avoidance was not feasible due to existing road, terrain, and steep slopes. Follow R10 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
This unit is greater than 1,000 feet in elevation. Goshawk surveys are not required.

POW LLA Twin Mountain Unit 122



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Unit 122							
Unit Number:	122	**Total Harvest Unit Acres**	20	**Prescription:**	EA	**Harvest System:**	Cable
VCU Number:	5880	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		448

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are not defined by a single dominant overstory species, but rather by a mixture of many species. This stand predominantly contains western hemlock, redcedar, and yellow-cedar in varying degrees and densities. Spruce, mountain hemlock, and shorepine are also found but at low densities and infrequently. The stand structure is complex and the canopy is fairly broken throughout and due mainly to poor soil drainage but also tree mortality. Overstory trees vary in size but are smaller in diameter than other forest types, and moderately-to-poorly stocked. This stand is mature with moderate stem decay and defect resulting in a situation where stand growth is being offset by decay. Snags and downed wood are common throughout. The understory is heavy throughout because of breaks in the canopy and contains a variety of well-distributed shrubs and forbs. This stand has varying levels of disease, including mistletoe, and decay throughout, ranging from light to heavy. The risk for windthrow in this stand is low due to the existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guidelines or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. Because the potential opening of the planned harvest unit was greater than 20 acres in size, legacy is designated for retention to meet this requirement (Forest Plan, page 4-68). No concerns were identified in this unit that would require a review for a RAW buffer.

TIMBER/LOGGING

This unit is planned for a combination of uphill and downhill cable yarding to landings located along a proposed temporary road off of NFSR 2050331.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2050331 (BMP 14.20, Road-4, Road-6). New temporary road construction, 0.14 miles (BMPs 14.5, Road-3, Road-5, Road-6).

BOTANY

No botany concerns.

INVASIVE SPECIES

No weeds are known from this area. To keep this area weed-free follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest. Specifically follow recommendations under Activity Cards 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly inspect all borrow pits before use and transport of rock to the units or new roads.

FISHERIES

Stream Num.: 106_1.2L
Stream Class: II, III
Channel Type: HCV
Protection: Category A and B
Flagging: B/W, O/W
Buffer (RMA):
Class II for HCV: 100 feet or to the top of the side-slope break; whichever is greater
Class III for HCV: To the top of the side-slope break
Concerns: N/A

Stream Num.: 106_1.2L.1R

Unit 122

Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: Map Location C-3 (106_1.2L.2R)
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 106_1.2L.3R
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: Map Location C-3 (106_1.2L.2L)
Stream Class: III
Channel Type: HCM
Protection: Category B
Flagging: O/W
Buffer (RMA):
Class III for HCM: To the top of the side-slope break
Concerns: N/A

Stream Num.: 106_1.2L.3L
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 106_1.2R
Stream Class: III, IV
Channel Type: HCM, HCO
Protection: Category B and C
Flagging: O/W, G/W
Buffer (RMA):
Class III for HCM: To the top of the side-slope break
Class IV for HCM: No buffer
Concerns: N/A

Stream Num.: 106_1.2R.1R (106_1.3R)
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer

Unit 122

Concerns: N/A

Stream Num.: 106_1.2R.1R
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 106_1.3R.1L
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: Map Location C-2 (106_1.3R.1L.1L)
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

All Streams Protection/Mitigation Actions by Category:
All Categories implement BMPs
Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers.

Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers.

Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.

ROAD/STREAM CROSSING SUMMARY

The reconditioned NFS 2050331 road has 2 culvert replacements specified for Class IV or non-streams. The temporary road accessing the unit has an additional seven Class IV or non-stream crossings. Should temporary road locations be changed such that different streams would be crossed, structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3, 14.5 and AqEco-4.

GEOLOGY/KARST

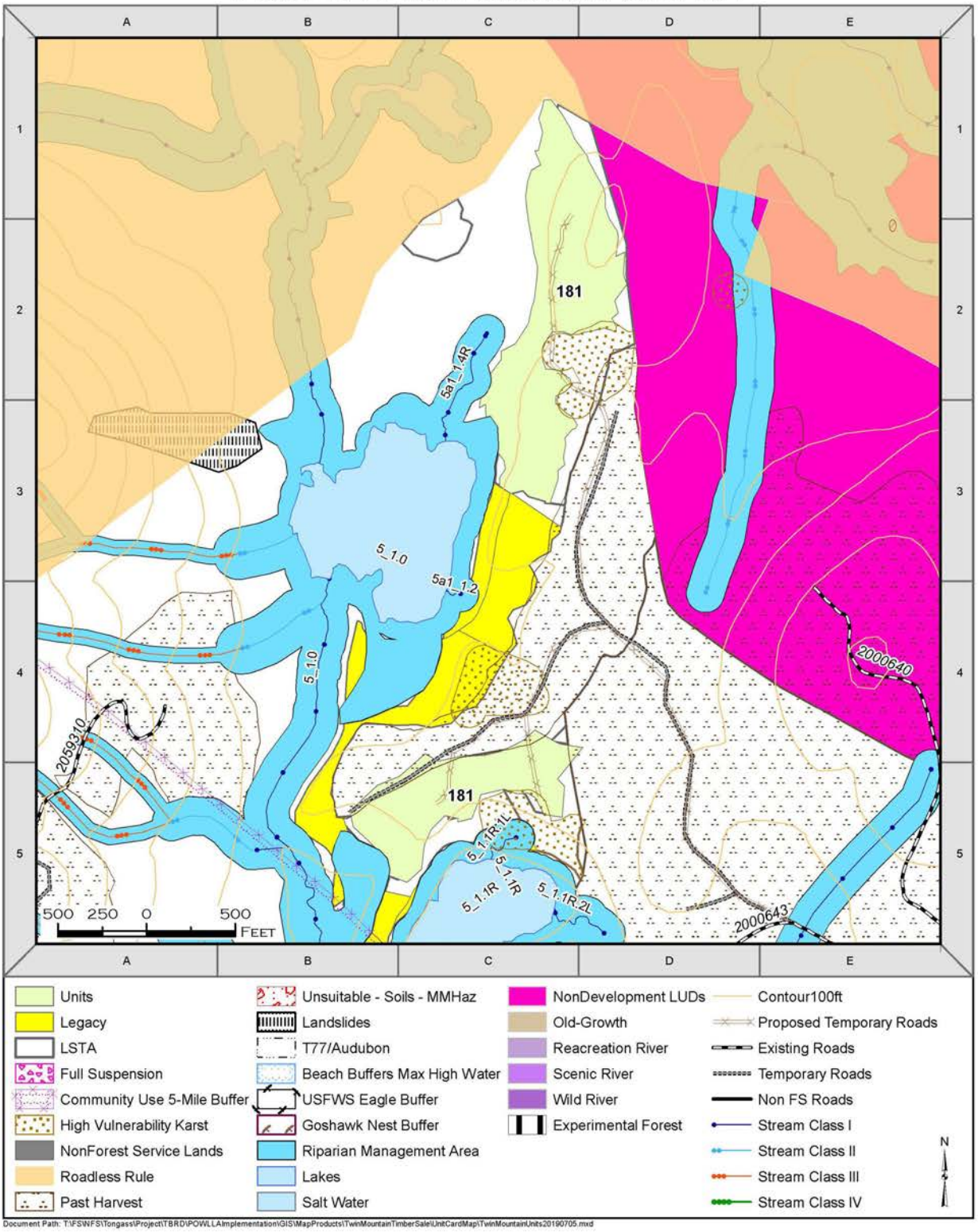
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.

HERITAGE RESOURCES

A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.

Unit 122
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes range from 25 to >72%. Approximately 81 acres were excluded to the south of this unit due to very high landslide prone terrain, steep slopes, and an abundance of dense streams. Minor areas of slopes >72% less than ¼ acre in size are located within the unit and are suitable. All slopes within the unit boundary are suitable for harvest with partial suspension cable yarding (R10 BMP 13.9 and National Core BMPs Plan-2, Veg-2, Veg-4, Veg-5, and Veg-6). About 10% of the unit contains forested wetlands on the more gentle lower elevation slopes (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4). The proposed temporary road does not cross any wetlands. Follow R10 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 181



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Unit 181							
Unit Number:	181	**Total Harvest Unit Acres**	29.4	**Prescription:**	EA	**Harvest System:**	Shovel
VCU Number:	5710	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		660

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by Sitka spruce in the overstory with lesser amounts of western hemlock unevenly distributed. Trees are typically large diameter and well stocked. The canopy is continuous, with few breaks, where breaks occur western hemlock regeneration is common. Snags are infrequent and unevenly distributed. The understory is comprised mainly of blueberry that is very unevenly distributed and in low amounts. Forbs are scarce and not a strong component of the understory.

This stand has light levels of mistletoe infections. Physical defect and stem decay is light to moderate with trace insect damage detected. The risk for windthrow in this stand is moderate to high.

The desired condition for this stand is a highly productive, healthy, windfirm, stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. Because the potential opening of the planned harvest unit was greater than 20 acres in size, legacy is designated for retention to meet this requirement (Forest Plan, page 4-68). No concerns were identified in this unit that would require a review for a RAW buffer.

TIMBER/LOGGING

This unit is planned for shovel yarding to landings located along a proposed temporary road off of NFS road 2000643.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2000643 (BMP 14.20, Road-4, Road-6). New temporary road on existing prism 0.87 miles. (BMPs 14.5, Road-3, Road-6). New temporary road construction, 0.41 miles (BMPs 14.5, Road-3, Road-5, Road-6).

BOTANY

No botany concerns.

INVASIVE SPECIES

Weeds are in the area of the unit. Follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest, but specifically in 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, to reduce the risk of further introduction, inspect all borrow pits before use and transport of rock to the units or new roads. See Krosse 2017 for all BMP's.

FISHERIES

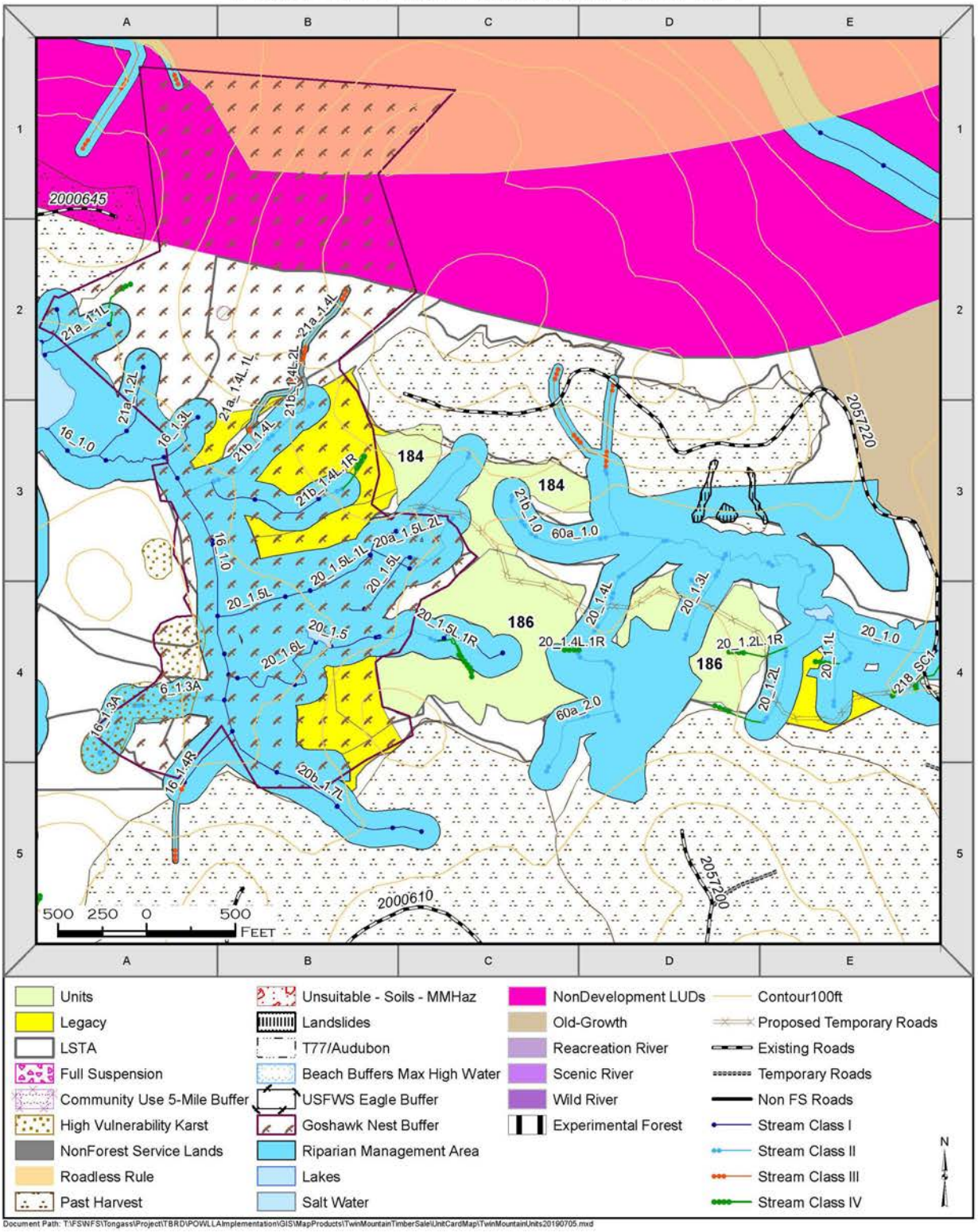
Stream Num.: 5_1.1R.1L
Stream Class: I
Channel Type: PAO
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class I for PAO: 100 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater
Concerns: Karst

Stream Num.: 5a1_1.4R
Stream Class: I

Unit 181
Channel Type: PAO, HCLw Protection: Category A Flagging: B/W Buffer (RMA): Class I for PAO: 100 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater Class I for HCLw: 100 feet or to the top of the side-slope break; whichever is greater Concerns: N/A
All Streams Protection/Mitigation Actions by Category: All Categories implement BMPs Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers. Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
Two NFS roads are being reconditioned. The NFS 2000640 road has one Class I crossing and one Class II crossing, both bridges, both require Title 16 concurrence and have construction timing restrictions. This road also has two Class IV or non-stream crossing re-installations. The NFS 2000643 road has three crossings all to be for Class IV, non-stream or ditch relief crossings that will be re-installed. The temporary roads are both reconstruction and new construction, and no stream crossings are specified. Should temporary road locations be changed such that different streams would be crossed, structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3, 14.5 and AqEco-4.
GEOLOGY/KARST
Unit has been reviewed for karst and cave resources. Most of the unit is underlain by low and moderate vulnerability karst with inclusions of high vulnerability surrounding discrete karst features. A no harvest buffer has been flagged surrounding these karst features, the unit as laid out reflects this area. A harvest method that obtains partial suspension is required on the moderate vulnerability karst. In the northern setting the temporary access road crosses a small area of high vulnerability karst. Minimize clearing limits and grubbing. Flush cut stumps to the ground. Do not deck logs pioneered from the road clearing limits outside the clearing limits. Use a fill-type construction rather than a balanced cut and fill design. This most likely will be possible since the slope gradient of these areas are generally >15%. A "plan-in-hand" review by the karst management specialist of the proposed road construction prior to actual construction is required. The karst management specialist needs to work closely with engineering to carefully design these roads coordinating efforts with the planning team.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.

Unit 181
SOILS/WETLANDS
Slopes are gentle in the southern polygon and less than 55% in the northern polygon. The soils and wetlands are suitable for shovel yarding. Follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMPs 12.5 and 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). The temporary road locations do not cross any wetland. Follow R10 BMPs12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 184



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Unit 184							
Unit Number:	184	**Total Harvest Unit Acres**	8	**Prescription:**	EA	**Harvest System:**	Shovel
VCU Number:	5710	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		180

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock in the overstory with lesser amounts of spruce and cedar irregularly distributed throughout. Stand structure is variable, containing breaks in the canopy from tree mortality and windthrow where a variety of trees sizes are found, but also has areas of continuous canopy cover where overstory trees are well-stocked. Trees range in size from small seedlings to large diameter dominant overstory individuals. Snags and downed wooded are distributed throughout. The understory is predominantly blueberry with lesser amounts of rusty menziesia and red huckleberry. Forbs commonly found in old-growth are distributed throughout in varied densities. This stand has light levels of physical defect and stem decay with trace insect damage noted in the overstory. Mistletoe infections as well as the risk of windthrow in this stand is moderate.

The desired condition for this stand is a highly productive, healthy, windfirm, stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

This stand is mature with moderate stem decay and defect resulting in a situation where stand growth is being offset by decay. Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. Because the potential opening of the planned harvest unit was greater than 20 acres in size, legacy is designated for retention to meet this requirement (Forest Plan, page 4-68). RAW buffers in this unit were initially indicated but were determined to be unnecessary after field review by qualified specialists.

TIMBER/LOGGING

This unit is planned for shovel yarding to landings located along a proposed temporary road off of NFSR 2057220 as a continuation of temporary road accessing unit 186.

ENGINEERING/SYSTEM ROADS

Access via existing NFS roads 2000642 and 2057220 (BMP 14.20, Road-4, Road-6). New temporary road construction, 0.15 miles (BMPs 14.5, Road-3, Road-5, Road-6).

BOTANY

No restrictions for botany.

INVASIVE SPECIES

No weeds are known from this area in GIS, but no recent surveys were conducted. To keep this area weed-free follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest. Specifically follow recommendations under Activity Cards 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly inspect all borrow pits before use and transport of rock to the units or new roads.

FISHERIES

Stream Num.: 20_1.5L (20a_1.5L.2L)
Stream Class: II
Channel Type: HCO
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class II for HCO: 100 feet or to the top of the side-slope break; whichever is greater
Concerns: N/A

Stream Num.: 20_1.5L.1L
Stream Class: I, II

Unit 184

Channel Type: MMO, HCO
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class I for MMO: 120 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater
Class II for HCO: 100 feet or to the top of the side-slope break; whichever is greater
Concerns: N/A

Stream Num.: 21b_1.4L.1R
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 60a_1.0 / 21b_1.0
Stream Class: II
Channel Type: PAS, HCO
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class II for PAS: 100 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater
Class II for HCO: 100 feet or to the top of the side-slope break; whichever is greater
Concerns: N/A

Stream Num.: Map Location C-3 / C-2
Stream Class: II, III
Channel Type: HCL, HCM
Protection: Category A and B
Flagging: B/W, OW
Buffer (RMA):
Class II for HCL: 100 feet or to the top of the side-slope break; whichever is greater
Class III for HCM: To the top of the side slope break
Concerns: N/A

All Streams Protection/Mitigation Actions by Category:
All Categories implement BMPs
Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers.

Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers.

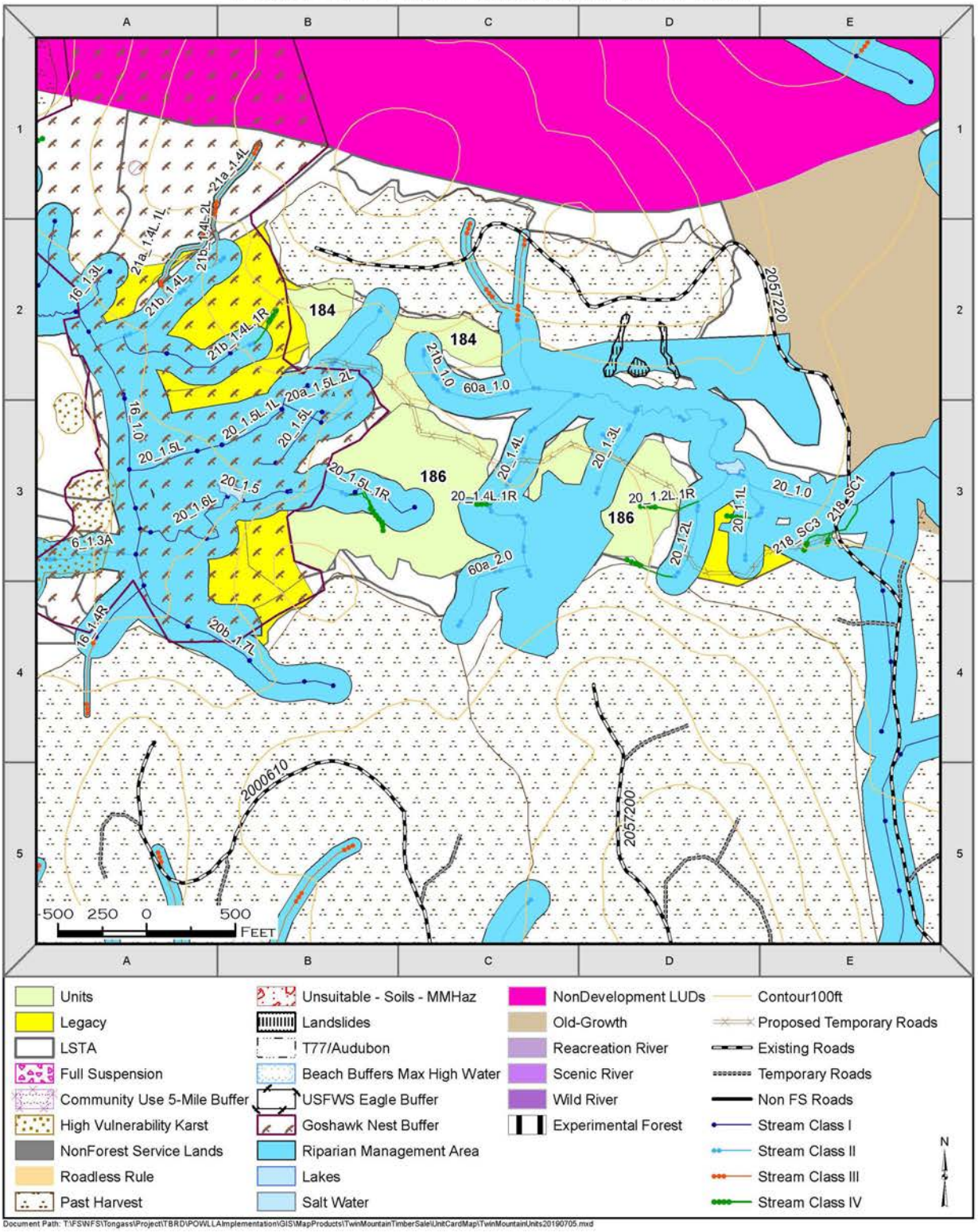
Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.

ROAD/STREAM CROSSING SUMMARY

The NFS 2057220 road has one Class IV crossing being installed as part of its reconditioning. Temporary road is planned to cross one Class II stream to access a portion of this unit. This crossing will require Title 16 concurrence and construction timing requirements. Should temporary road locations be changed such that different streams would be crossed, structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3, 14.5 and AqEco-4.

Unit 184
GEOLOGY/KARST
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes range from gentle to >72%. The small areas of slopes >72% are small short pitches. The soils and wetlands are suitable for shovel yarding and should follow the shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMPs 12.5 and 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). The proposed temporary road does not cross any wetland. Follow R10 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
Territorial goshawk behavior was detected during survey in 2017. A goshawk nest was discovered in 2019 in Unit 184. This unit boundary was impacted by the implementation of a 100 acre buffer on the goshawk nest discovered in this unit. Unit boundary of unit 184 cannot be changed without consulting a wildlife biologist. Legacy retention acres in Unit 184 are included in the goshawk nest buffer. Legacy retention acres cannot be changed without consulting a wildlife biologist.

POW LLA Twin Mountain Unit 186



Units
Legacy
LSTA
Full Suspension
Community Use 5-Mile Buffer
High Vulnerability Karst
NonForest Service Lands
Roadless Rule
Past Harvest

Unsuitable - Soils - MMHaz
Landslides
T77/Audubon
Beach Buffers Max High Water
USFWS Eagle Buffer
Goshawk Nest Buffer
Riparian Management Area
Lakes
Salt Water

NonDevelopment LUDs
Old-Growth
Reacreation River
Scenic River
Wild River
Experimental Forest

Contour100ft
Proposed Temporary Roads
Existing Roads
Temporary Roads
Non FS Roads
Stream Class I
Stream Class II
Stream Class III
Stream Class IV

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Unit 186							
Unit Number:	186	**Total Harvest Unit Acres**	24.5	**Prescription:**	EA	**Harvest System:**	Shovel
VCU Number:	5710	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		550

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock with a strong component of redcedar in the overstory, but also contains lesser amounts of spruce and yellow-cedar. Stand structure is complex with small infrequent breaks in the canopy from overstory mortality and variable soil drainage. Tree sizes cover a wide range and stocking ranges from moderate-to-well stocked. Snags are common throughout and fairly well-distributed. The understory layer moderately brushy, mainly blueberry, but has a strong component of rusty menziesia, and is unevenly distributed. Forbs commonly found in old-growth are distributed throughout. Trace levels of mistletoe and insect damage were noted in the overstory of this stand. Physical defect and stem decay were moderate. The risk for windthrow in this stand is moderate.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guidelines or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. Because the potential opening of the planned harvest unit was greater than 20 acres in size, legacy is designated for retention to meet this requirement (Forest Plan, page 4-68). RAW buffers along the Class II streams in the unit were initially indicated but were determined to be unnecessary after field review by qualified specialists.

TIMBER/LOGGING

This unit is planned for shovel yarding to landings located along a proposed temporary road off of NFSR 2057220 with continuation to access unit 184.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2057220 (BMP 14.20, Road-4, Road-6). New temporary road construction, 0.56 miles (BMPs 14.5, Road-3, Road-5, Road-6).

BOTANY

No restrictions for botany.

INVASIVE SPECIES

No weeds are known from this area in GIS, but no recent surveys were conducted. To keep this area weed-free follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest. Specifically follow recommendations under Activity Cards 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly inspect all borrow pits before use and transport of rock to the units or new roads.

FISHERIES

Stream Num.: 20a_1.5L.2L
Stream Class: II
Channel Type: HCO
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class II for HCO: 100 feet or to the top of the side-slope break; whichever is greater
Concerns: N/A

Stream Num.: 20_1.5L.1R
Stream Class: I
Channel Type: HCM
Protection: Category A
Flagging: B/W

Unit 186

Buffer (RMA):
Class II for HCM: 100 feet or to the top of the side-slope break; whichever is greater
Concerns: N/A

Stream Num.: Map Location B-3 (218_1.5L.1R.1R)
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 60a_1.0 / 21b_1.0
Stream Class: II
Channel Type: PAS, HCO
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class II for PAS: 100 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater
Class II for HCO: 100 feet or to the top of the side-slope break; whichever is greater
Concerns: N/A

Stream Num.: 20_1.2L
Class: II, IV
Channel Type: MMO, HCO
Protection: Category A and C
Flagging: B/W, G/W
Buffer (RMA):
Class II for MMO: 120 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 20_1.2L.1R
Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 20_1.3L
Stream Class: II
Channel Type: HCO
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class II for HCO: 100 feet or to the top of the side-slope break; whichever is greater
Concerns: N/A

Stream Num.: Map Location D-3 (20_1.3L.1R)
Stream Class: II
Channel Type: HCO
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class II for HCO: 100 feet or the top of the side-slope break; whichever is greater
Concerns: N/A

Unit 186

Stream Num.: 20a_1.4L
Stream Class: II
Channel Type: PAO, FPO, HCM, MCS, PAB, MMO
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class II for PAO: 100 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater
Class II for FPO: 130 feet or to the extent of the riparian zone; whichever is greater
Class II for HCM: 100 feet or to the top of the side-slope break; whichever is greater
Class II for MCS: 100 feet or to the top of the side-slope break; whichever is greater
Class II for PAB: 100 feet or to the extent of the riparian zone; whichever is greater
Class II for MMO: 120 feet or to the extent of the riparian zone; whichever is greater
Concerns: N/A

Stream Num.: 60a_2.0
Stream Class: II
Channel Type: PAB
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class II for PAB: 100 feet or to the extent of the riparian zone; whichever is greater
Concerns: N/A

Stream Num.: 20_1.4L.1R
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

All Streams Protection/Mitigation Actions by Category:
All Categories implement BMPs
Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers.

Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers.

Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.

ROAD/STREAM CROSSING SUMMARY

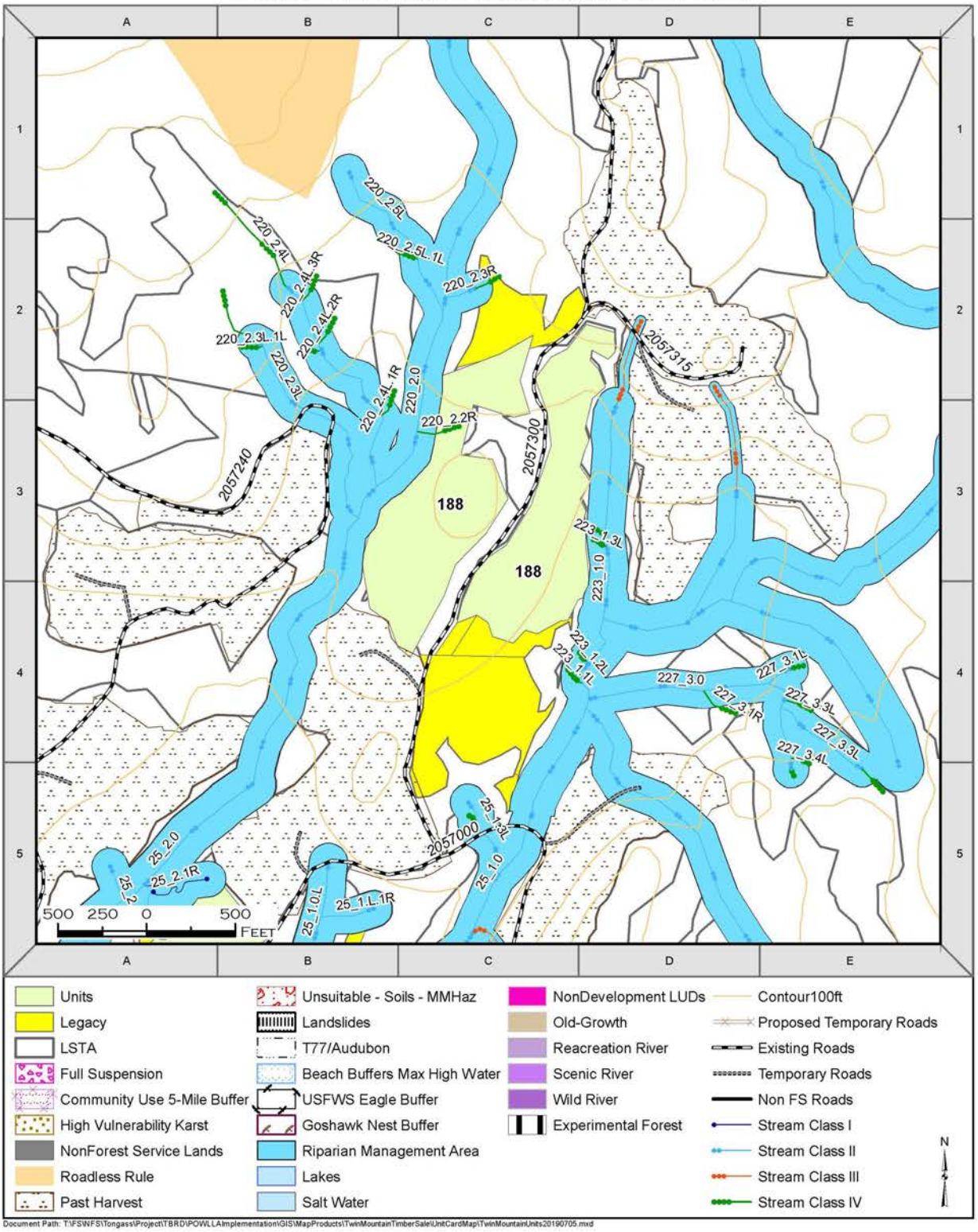
The NFS 2057220 road has one Class IV crossing being installed as part of its reconditioning. Temporary road is planned to cross four Class II streams. These crossings will require Title 16 concurrence and construction timing requirements. There are also four Class IV or non-stream crossings planned for this temporary road. Should temporary road locations be changed such that different streams would be crossed, structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3, 14.5 and AqEco-4.

GEOLOGY/KARST

Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.

Unit 186
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes are gentle to up to 55%. The soils and wetlands are suitable for shovel yarding. Follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMPs 12.5 and 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). Forested wetlands are dominant in the unit (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4). The temporary road traverses about 1 acre of forested wetland within the unit and about ½ acre outside of the unit. Wetland avoidance was not feasible due to the location of the existing road, streams, RMA, and wetland abundance. Follow R10 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
Territorial goshawk behavior was detected during surveys in 2017. This may be the same pair as detected in 2017 in Unit 181. A goshawk nest was discovered in 2019 in Unit 184. Unit boundary of Unit 186 impacted due to buffer on the goshawk nest in Unit 184. Legacy retention acres in this unit count towards the 100 acre goshawk nest buffer for the nest in Unit 184. The legacy acres cannot be changed without consulting a wildlife biologist. Unit boundary of Unit 186 cannot be changed without consulting a wildlife biologist.

POW LLA Twin Mountain Unit 188



Units
Legacy
LSTA
Full Suspension
Community Use 5-Mile Buffer
High Vulnerability Karst
NonForest Service Lands
Roadless Rule
Past Harvest

Unsuitable - Soils - MMHaz
Landslides
T77/Audubon
Beach Buffers Max High Water
USFWS Eagle Buffer
Goshawk Nest Buffer
Riparian Management Area
Lakes
Salt Water

NonDevelopment LUDs
Old-Growth
Reacreation River
Scenic River
Wild River
Experimental Forest

Contour100ft
Proposed Temporary Roads
Existing Roads
Temporary Roads
Non FS Roads
Stream Class I
Stream Class II
Stream Class III
Stream Class IV

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Unit 188							
Unit Number:	188	**Total Harvest Unit Acres**	31.3	**Prescription:**	EA	**Harvest System:**	Shovel
VCU Number:	5710	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		702

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock in the overstory with lesser amounts of spruce and cedar irregularly distributed throughout. Stand structure is variable, containing breaks in the canopy from tree mortality and windthrow where a variety of trees sizes are found, but also has areas of continuous canopy cover where overstory trees are well-stocked. Trees range in size from small seedlings to large diameter dominant overstory individuals. Snags and downed wooded are distributed throughout. The understory is predominantly blueberry with lesser amounts of rusty menziesia and red huckleberry. Forbs commonly found in old-growth are distributed throughout in varied densities. Trace levels of mistletoe infections and insect damage was detected in the overstory. This stand has moderate levels of physical defect and stem decay. The risk for windthrow in this stand is moderate.

The desired condition for this stand is a highly productive, healthy, windfirm, stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

This stand is mature with moderate stem decay and defect resulting in a situation where stand growth is being offset by decay. Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. Because the potential opening of the planned harvest unit was greater than 20 acres in size, legacy is designated for retention to meet this requirement (Forest Plan, page 4-68). RAW buffers along the Class II stream to the west of this unit were initially indicated but were determined to be unnecessary after field review by qualified specialists.

TIMBER/LOGGING

This unit is planned for shovel yarding to landings located along NFSR 2057300.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2057300 (BMP 14.20, Road-4, Road-6).

BOTANY

No botany concerns.

INVASIVE SPECIES

Weeds are in the area of the unit along NFSR 2057300. Follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest, but specifically in 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, to reduce the risk of further introduction, inspect all borrow pits before use and transport of rock to the units or new roads. See Krosse 2017 for all BMP's.

FISHERIES

Stream Num.: 220_2.0
Stream Class: II
Channel Type: HCM
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class II for HCM: 100 feet or to the top of the side-slope break; whichever is greater
Concerns: N/A

Stream Num.: 220_2.2R
Stream Class: IV
Channel Type: HCO
Protection: Category C

Unit 188

Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 220_2.3L
Stream Class: II
Channel Type: HCO
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class II for HCO: 100 feet or to the top of the side-slope break; whichever is greater
Concerns: N/A

Stream Num.: 220_2.4L
Stream Class: II
Channel Type: HCO
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class II for HCO: 100 feet or to the top of the side-slope break; whichever is greater
Concerns: N/A

Stream Num.: 223_1.0
Stream Class: II, III
Channel Type: MMS, HCL, HCM
Protection: Category A, B
Flagging: B/W, O/W
Buffer (RMA):
Class II for MMS: 120 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater
Class II for HCL: 100 feet or to the top of the side-slope break; whichever is greater
Class III for HCM: To the top of the side-slope break
Concerns: Blowdown

Stream Num.: 223_1.2L
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 223_1.3L
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: Map Location C-3 (223_1.4L)
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Unit 188

Stream Num.: Map Location D-4
Stream Class: II
Channel Type: MMM
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class II for MMM: 120 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater
Concerns: N/A

All Streams Protection/Mitigation Actions by Category:
All Categories implement BMPs
Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers.

Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers.

Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.

ROAD/STREAM CROSSING SUMMARY

The reconstructed NFS 2057300 road accesses unit and does not specify culvert work. No temporary roads are planned for this unit. Should temporary road/stream crossings be needed, crossing structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3 and 14.5.

GEOLOGY/KARST

Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.

HERITAGE RESOURCES

A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.

SCENERY

No scenery concerns.

RECREATION

No recreation concerns.

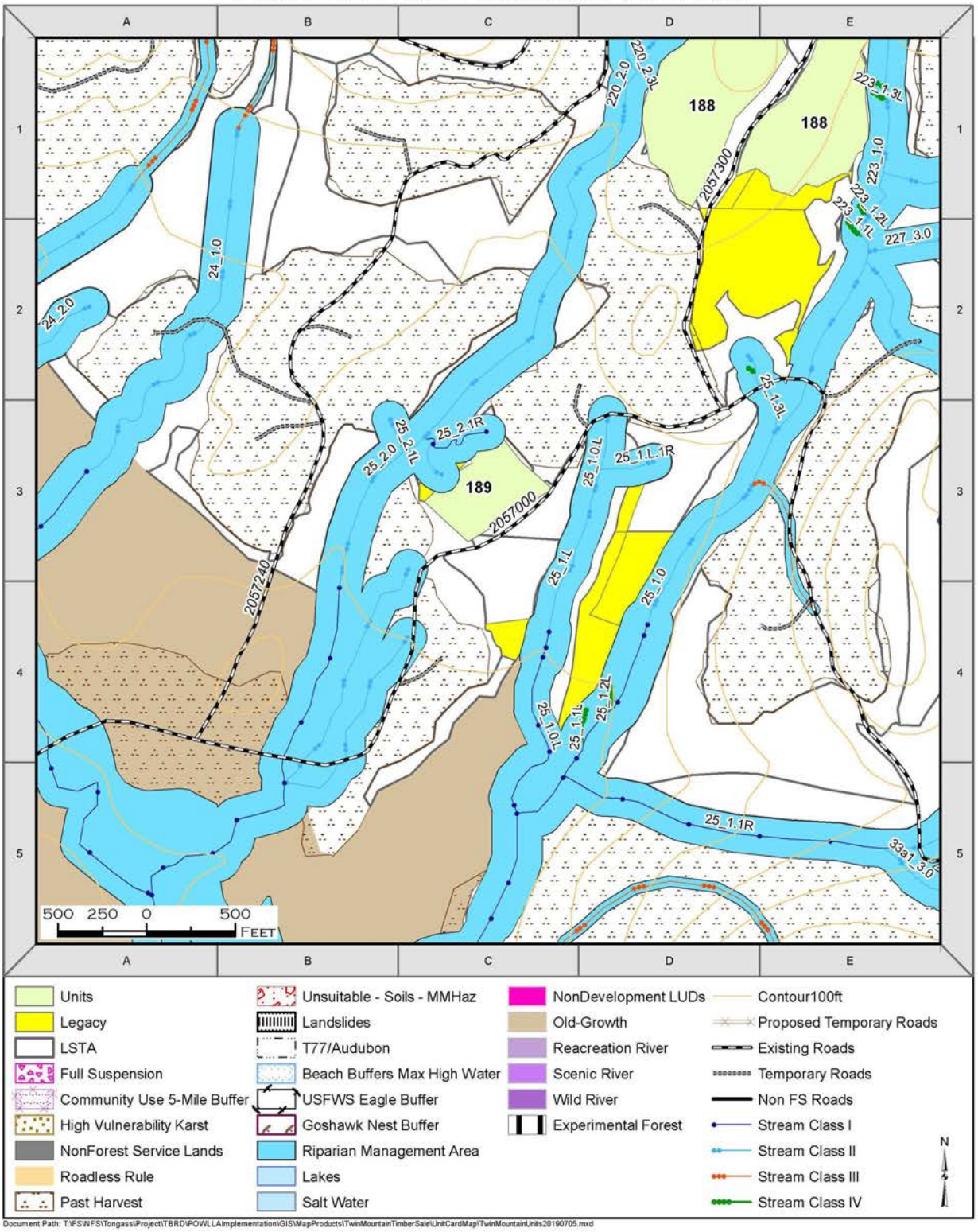
SOILS/ WETLANDS

Slopes are gentle to 55% in both polygons. Slopes greater than 25% are concentrated along small knobs in the unit. The soils and wetlands are suitable for shovel yarding. Follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMPs 12.5 and 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). Forested wetlands and forested wetland/ emergent short sedge are dominant throughout the unit (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4).

WILDLIFE

Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 189



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Unit 189							
Unit Number:	189	**Total Harvest Unit Acres**	4.7	**Prescription:**	EA	**Harvest System:**	Shovel
VCU Number:	5710	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		106

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock with a strong component of redcedar in the overstory, but also contains lesser amounts of spruce and yellow-cedar. Stand structure is complex with small infrequent breaks in the canopy from overstory mortality and variable soil drainage. Tree sizes cover a wide range and stocking ranges from moderate-to-well stocked. Snags are common throughout and fairly well-distributed. The understory layer moderately brushy, mainly blueberry, but has a strong component of rusty menziesia, and is unevenly distributed. Forbs commonly found in old-growth are distributed throughout. Trace levels of insect damage was noted in the overstory. This stand has moderate levels of physical defect and stem decay. Mistletoe infections and the risk for windthrow in this stand are moderate.

The desired condition for this stand is a highly productive, healthy, windfirm, stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

This stand is mature with moderate stem decay and defect resulting in a situation where stand growth is being offset by decay. Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. Because the potential opening of the planned harvest unit was greater than 20 acres in size, legacy is designated for retention to meet this requirement (Forest Plan, page 4-68). No concerns were identified in this unit that would require a review for a RAW buffer.

TIMBER/LOGGING

This unit is planned for shovel yarding to landings located along NFSR 2057000.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2057000 (BMP 14.20, Road-4, Road-6).

BOTANY

No botany concerns.

INVASIVE SPECIES

Weeds are in the area of the unit along NFSR 2057000. Follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest, but specifically in 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, to reduce the risk of further introduction, inspect all borrow pits before use and transport of rock to the units or new roads. See Krosse 2017 for all BMP's.

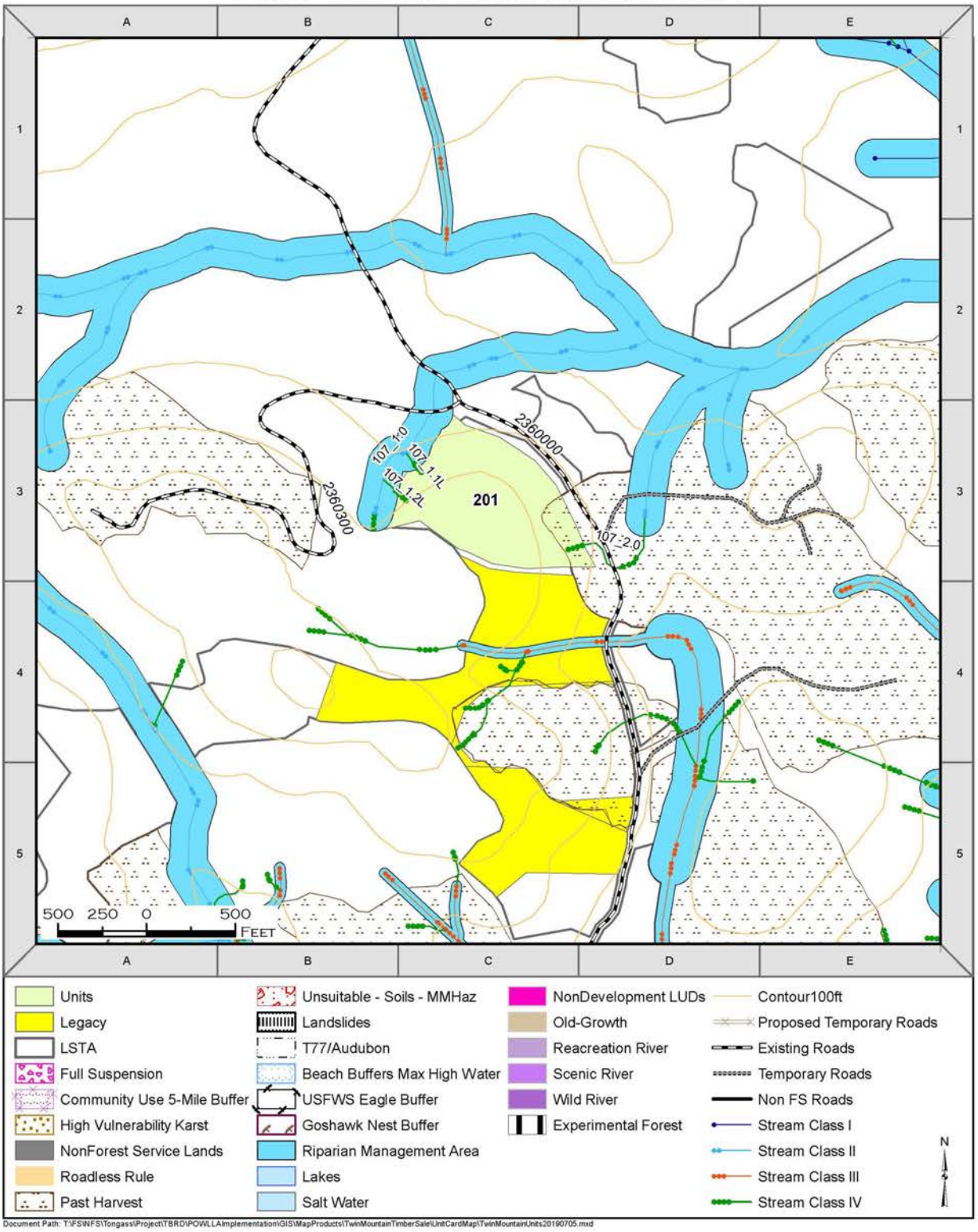
FISHERIES

Stream Num.: 25_2.1R
Stream Class: I
Channel Type: PAO
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class I for PAO: 100 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater
Concerns: N/A

Stream Num.: 25_2.1R.1R
Stream Class: II
Channel Type: PAO
Protection: Category A

Unit 189
Flagging: B/W Buffer (RMA): Class II for PAO: 100 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater Concerns: N/A
All Streams Protection/Mitigation Actions by Category: All Categories implement BMPs Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers. Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
No temporary roads planned. Should temporary road/stream crossings be needed, crossing structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3 and 14.5.
GEOLOGY/KARST
Unit review and surveys have been completed. Only a small part of the eastern portion of the unit is underlain by karst. The karst vulnerability is low. No special mitigation is necessary. There are no known karst and cave resource concerns.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes are less than 25%. The soils and wetlands are suitable for shovel yarding. Follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMPs 12.5 and 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). Forested wetlands are dominant in the unit (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4).
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 201



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Unit 201							
Unit Number:	201	**Total Harvest Unit Acres**	13.8	**Prescription:**	EA	**Harvest System:**	Cable
VCU Number:	5770	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		310

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock with a strong component of redcedar in the overstory, but also contains lesser amounts of spruce and yellow-cedar. Stand structure is complex with small infrequent breaks in the canopy from overstory mortality and variable soil drainage. Tree sizes cover a wide range and stocking ranges from moderate-to-well stocked. Snags are common throughout and fairly well-distributed. The understory layer moderately brushy, mainly blueberry, but has a strong component of rusty menziesia, and is unevenly distributed. Forbs commonly found in old-growth are distributed throughout. This stand has varying levels of physical defect and stem decay throughout. The risk for windthrow in this stand is moderate. High windthrow was noted along edges of recent past harvest. Yellow-cedar decline was observed on the lowest productivity areas.

The desired condition for this stand is a highly productive, healthy, windfirm, stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

This stand is mature with areas of high decay and defect resulting in a situation where stand growth is being offset by decay. Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. Because the potential opening of the planned harvest unit was greater than 20 acres in size, legacy is designated for retention to meet this requirement (Forest Plan, page 4-68). RAW buffers along the Class II stream to the west of this unit were initially indicated but were determined to be unnecessary after field review by qualified specialists.

TIMBER/LOGGING

This unit is planned for downhill cablel yarding to landings located along NFS road 2360000.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2360000 (BMP 14.20, Road-4, Road-6).

BOTANY

No botany concerns.

INVASIVE SPECIES

Weeds are in the area along NFSR 2360000. Follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest, but specifically in 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, to reduce the risk of further introduction, inspect all borrow pits before use and transport of rock to the units or new roads. See Krosse 2017 for all BMP's.

FISHERIES

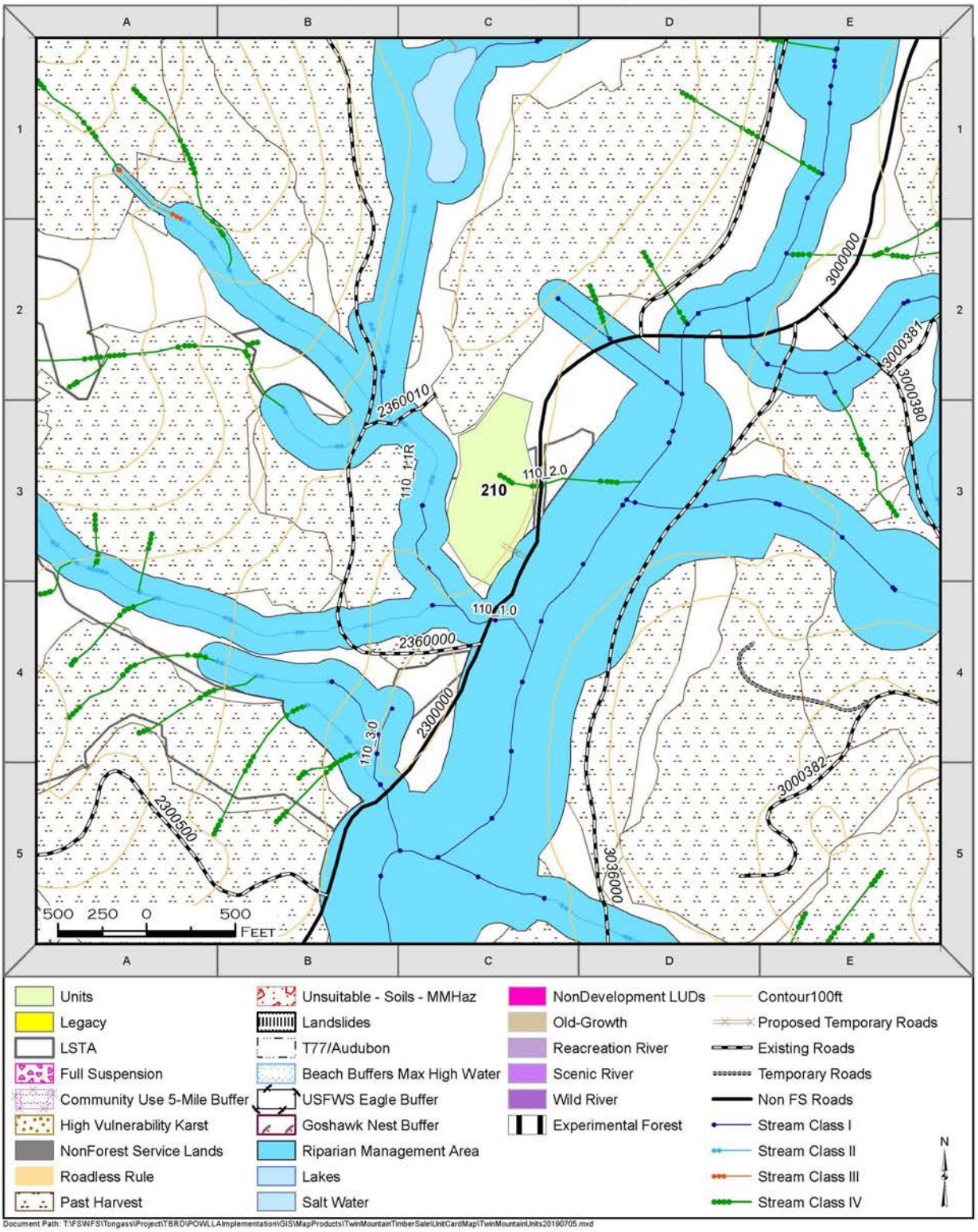
Stream Num.: 107_1.0
Stream Class: II, IV
Channel Type: HCL, HCO
Protection: Category A and C
Flagging: B/W, G/W
Buffer (RMA):
Class II for HCL: 100 feet or to the top of the side-slope break; whichever is greater
Class II for HCO: 100 feet or to the top of the side-slope break; whichever is greater
Class IV for HCO: No Buffer
Concerns: N/A

Stream Num.: 107_1.1L
Stream Class: IV

Unit 201
Channel Type: HCLw Protection: Category C Flagging: G/W Buffer (RMA): Class IV for HCLw: No Buffer Concerns: N/A Stream Num.: 107_1.2L Stream Class: IV Channel Type: HCO Protection: Category C Flagging: G/W Buffer (RMA): Class IV for HCO: No Buffer Concerns: N/A Stream Num.: 107_2.0 Stream Class: IV Channel Type: HCO Protection: Category C Flagging: G/W Buffer (RMA): Class IV for HCO: No Buffer Concerns: N/A
All Streams Protection/Mitigation Actions by Category: All Categories implement BMPs Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers. Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
No temporary roads planned. Should temporary road/stream crossings be needed, crossing structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3 and 14.5.
GEOLOGY/KARST
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes range from gentle to greater than 72%. About an acre of small knobs 25ft in length with 72% slopes were observed in the unit. All slopes within the unit boundary are suitable for a minimum of partial suspension (R10

Unit 201
BMPs 12.5, 13.5, and 13.9 and National Core BMPs Plan-2, AqEco-2, AqEco-4, Veg-1, Veg-2, Veg-5, and Veg-6). Forested wetland are present throughout the unit (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4).
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 210



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Unit 210							
Unit Number:	210	**Total Harvest Unit Acres**	8.9	**Prescription:**	EA	**Harvest System:**	Shovel
VCU Number:	5770	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		199

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock in the overstory with lesser amounts of spruce and cedar irregularly distributed throughout. Stand structure is variable, containing breaks in the canopy from tree mortality and windthrow where a variety of trees sizes are found, but also has areas of continuous canopy cover where overstory trees are well-stocked. Trees range in size from small seedlings to large diameter dominant overstory individuals. This stand is mature with moderate stem decay and defect resulting in a situation where stand growth is being offset by decay. Snags and downed wooded are distributed throughout. The understory is predominantly blueberry with lesser amounts of rusty menziesia and red huckleberry. Forbs commonly found in old-growth are distributed throughout but in varied densities. This stand has varying but generally lower levels of disease and decay throughout, with trace insect activity and root rot potentially noted as well. Mistletoe infections are present at low levels. The risk for windthrow in this stand is moderate due to its heavy exposure to southern winds, and existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guidelines or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. However, the potential opening of the planned harvest unit was less than 20 acres in size which eliminates this requirement (Forest Plan, page 4-68). No concerns were identified in this unit that would require a review for a RAW buffer.

TIMBER/LOGGING

This unit is planned for shovel yarding to landings located along NFS road 2300000 and a proposed temporary road off of NFS road 2300000.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2300000 (BMP 14.20, Road-4, Road-6). New temporary road construction, 0.03 miles (BMPs 14.5, Road-3, Road-5, Road-6).

BOTANY

No botany concerns.

INVASIVE SPECIES

There are documented invasive plant infestations near this unit, including infestations of *Cirsium arvense* (Canada thistle) and *Cirsium vulgare* (bull thistle), located along the NFS road 2300000. Additional site specific design features may be recommended to reduce the spread and introduction of these weeds into new roadbeds or into recently harvested habitat. Both of these plants pose a high risk for spread. Follow the Invasive Plant Management's Weed BMP's (Krosse 2017) outlined in Activity Cards 13, 19, 23 and 24 in the POW LLA Final ROD (Appendix 1) to reduce the risk of introduction and spread. Most importantly, to reduce the risk of further introduction, inspect all borrow pits before use and transport of rock to the units or new roads.

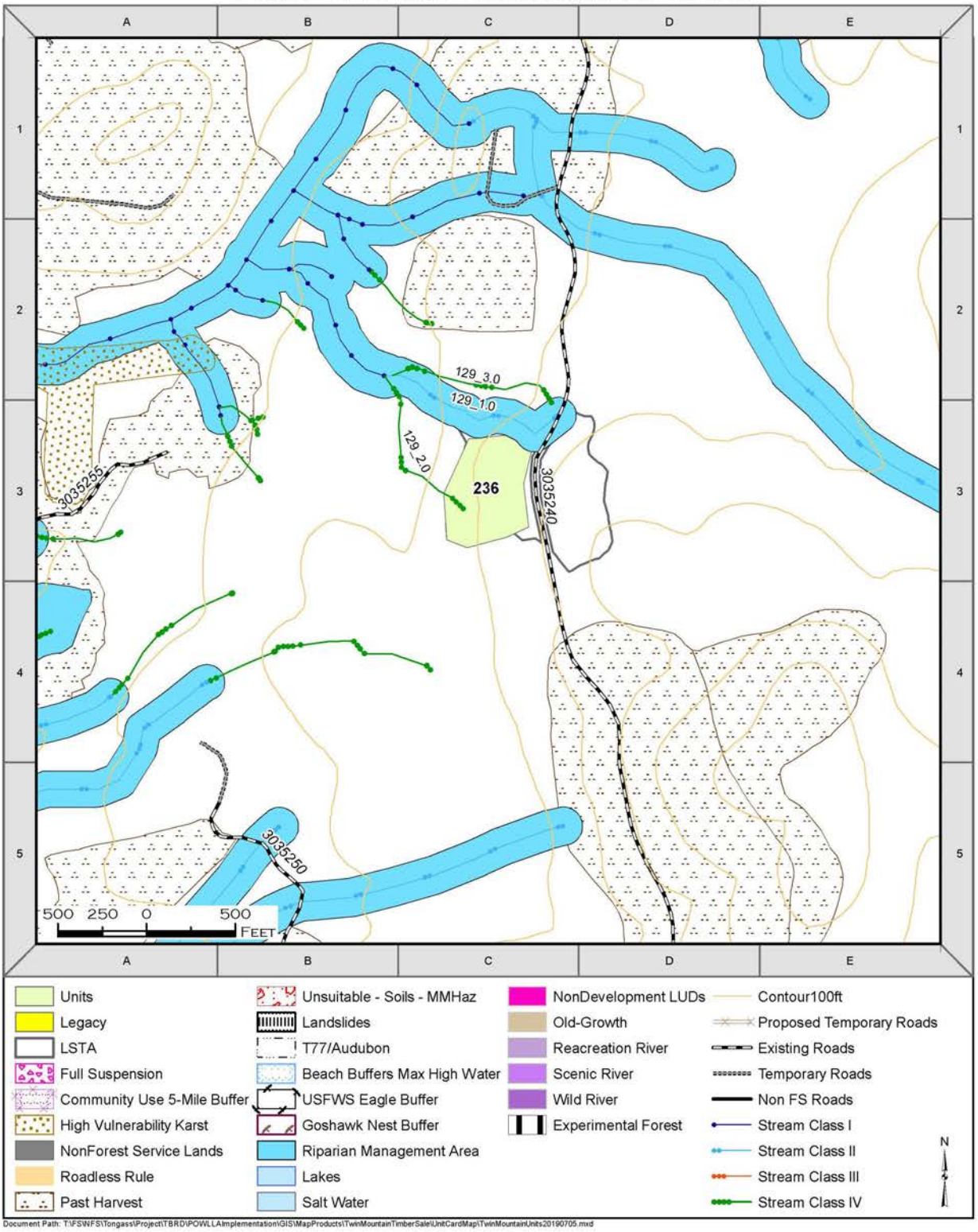
FISHERIES

Stream Num.: 110_1.0
Stream Class: I
Channel Type: MMS
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class I for MMS: 120 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater

Unit 210
Concerns: N/A Stream Num.: 110_1.1R Stream Class: I, II Channel Type: MMS, HCL Protection: Category A Flagging: B/W Buffer (RMA): Class I for MMS: 120 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater Class II for HCL: 100 feet or to the top of the side-slope break; whichever is greater Concerns: N/A Stream Num.: 110_2.0 Stream Class: IV Channel Type: MMO, HCLw Protection: Category C Flagging: G/W Buffer (RMA): Class IV for MMO: No buffer Class IV for HCLw: No buffer Concerns: N/A
All Streams Protection/Mitigation Actions by Category: All Categories implement BMPs Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers. Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
The temporary road accessing this unit has one non-stream crossing specified. Should temporary road locations be changed such that different streams would be crossed, structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3, 14.5 and AqEco-4.
GEOLOGY/KARST
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes are less than 35%. The soils and wetlands are suitable for shovel yarding. Follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMPs 12.5 and 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). Forested wetlands occur in the northern portion of the unit (R10 BMP 12.5 and

Unit 210
National Core BMPs AqEco-2 and AqEco-4). The proposed temporary does not cross any wetland. Follow R10 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
Goshawk surveys required for May or June have not been completed. These surveys must be completed prior to implementation. Goshawk surveys required in July or August have been completed. All resource-specific protections and mitigations will be applied before harvest activities are implemented.

POW LLA Twin Mountain Unit 236



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Unit 236							
Unit Number:	236	**Total Harvest Unit Acres**	5.7	**Prescription:**	EA	**Harvest System:**	Cable
VCU Number:	5770	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		129

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are not defined by a single dominant overstory species, but rather by a mixture of many species. This stand predominantly contains western hemlock, redcedar, and yellow-cedar in varying degrees and densities. Spruce, mountain hemlock, and shorepine are also found but at low densities and infrequently. The stand structure is complex and the canopy is fairly broken throughout and due mainly to poor soil drainage but also tree mortality. Overstory trees vary in size but are smaller in diameter than other forest types, and moderately-to-poorly stocked. Snags and downed wood are common throughout. The understory is heavy throughout because of breaks in the canopy and contains a variety of well-distributed shrubs and forbs. This stand is mature with heavy stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections are moderate and heavy insect damage has been noted in the overstory. The risk for windthrow in this stand is moderate due to its exposure to winds coming off nearby muskegs and past harvest, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. However, the potential opening of the planned harvest unit was less than 20 acres in size which eliminates this requirement (Forest Plan, page 4-68). No concerns were identified in this unit that would require a review for a RAW buffer.

TIMBER/LOGGING

This unit is planned for uphill cable yarding to landings located along NFSR 3035240.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 3035240 (BMP 14.20, Road-4, Road-6).

BOTANY

No restrictions for botany.

INVASIVE SPECIES

No weeds are known from this area in GIS, but no recent surveys were conducted. To keep this area weed-free follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest. Specifically follow recommendations under Activity Cards 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly inspect all borrow pits before use and transport of rock to the units or new roads.

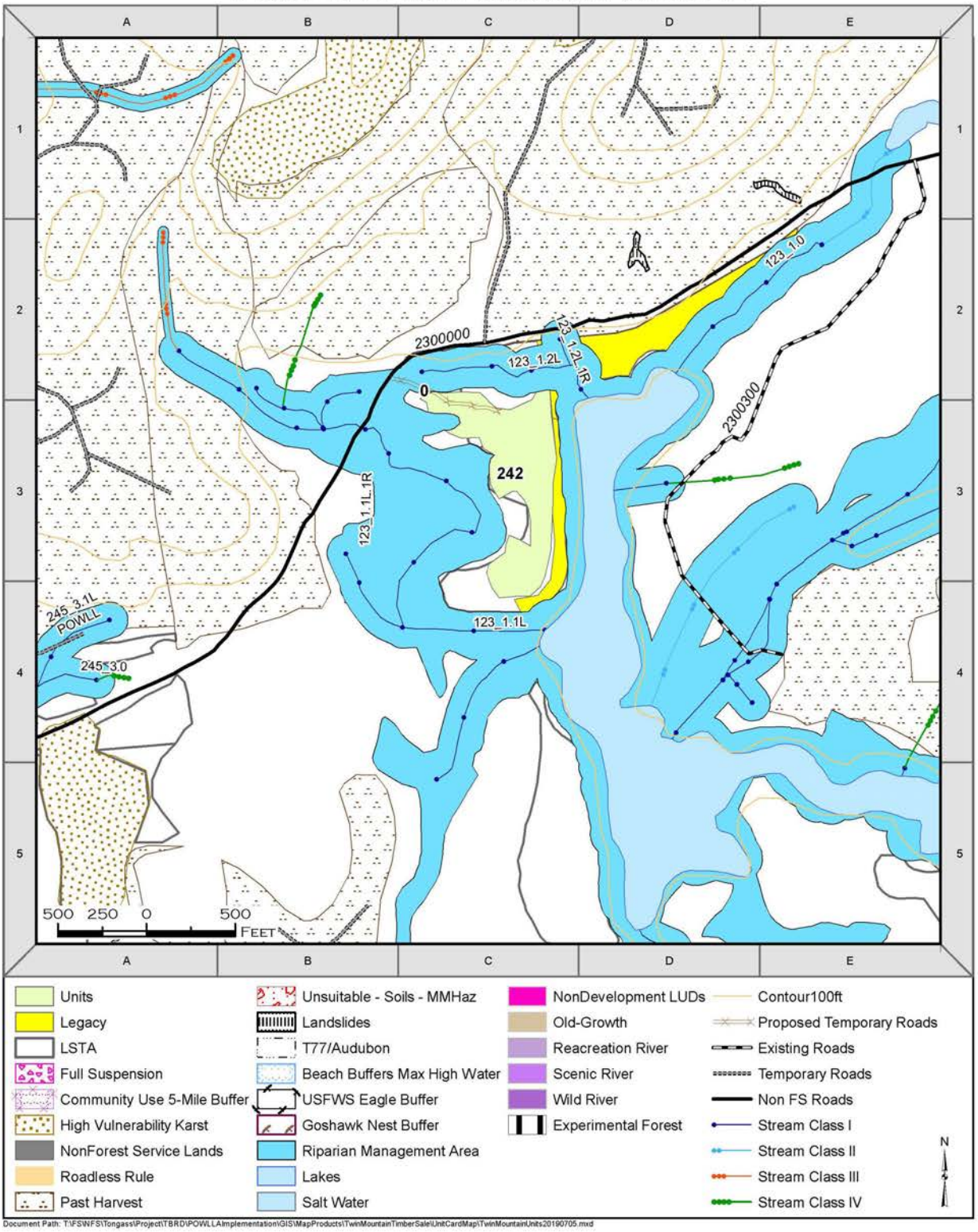
FISHERIES

Stream Num.: 129_1.0
Stream Class: II
Channel Type: HCO
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class II for HCO: 100 feet or to the top of the side-slope break; whichever is greater
Concerns: N/A

Stream Num.: 129_2.0
Stream Class: IV
Channel Type: HCO

Unit 236
Protection: Category C Flagging: G/W Buffer (RMA): Class IV for HCO: No buffer Concerns: N/A
All Streams Protection/Mitigation Actions by Category: All Categories implement BMPs Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers. Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
This unit is accessed by the reconstructed NFS 3035240 road, which does not have specified culvert work. No temporary roads planned. Should temporary road/stream crossings be needed, crossing structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3 and 14.5.
GEOLOGY/KARST
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes are gentle to 55%. The soils and wetlands are suitable for a minimum of partial suspension cable yarding (R10 BMPS 12.5, 13.5, and 13.9 and National Core BMPs Plan-2, AqEco-2, AqEco-4, Veg-1, Veg-2, Veg-5, and Veg-6). Forested wetlands are dominant in the unit (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4).
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 242



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Unit 242							
Unit Number:	242	**Total Harvest Unit Acres**	9.2 1 in ROW	**Prescription:**	EA	**Harvest System:**	Shovel
VCU Number:	5770	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		205 11 in ROW

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock in the overstory with lesser amounts of spruce and cedar irregularly distributed throughout. Stand structure is variable, containing breaks in the canopy from tree mortality and windthrow where a variety of trees sizes are found, but also has areas of continuous canopy cover where overstory trees are well-stocked. Trees range in size from small seedlings to large diameter dominant overstory individuals. This stand is mature with moderate stem decay and defect resulting in a situation where stand growth is being offset by decay. Snags and downed wooded are distributed throughout. The understory is predominantly blueberry with lesser amounts of rusty menziesia and red huckleberry. Forbs commonly found in old-growth are distributed throughout but in varied densities. This stand has varying levels of disease and decay throughout, ranging from light to heavy. Mistletoe infections are at trace levels. The risk for windthrow in this stand is high due to its timber type, rooting and exposure.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guidelines or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. Because the potential opening of the planned harvest unit was greater than 20 acres in size, legacy is designated for retention to meet this requirement (Forest Plan, page 4-68). No concerns were identified in this unit that would require a review for a RAW buffer.

TIMBER/LOGGING

This unit is planned for shovel yarding to landings located along a proposed temporary road off of NFSR 2300000. Additional acreage and volume described above for temporary road right-of-way outside unit boundary.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2300000 (BMP 14.20, Road-4, Road-6). New temporary road construction, 0.13 miles (BMPs 14.5, Road-3, Road-5, Road-6).

BOTANY

No botany concerns.

INVASIVE SPECIES

Weeds are in the area of the unit along the 2300000 road. Follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest, but specifically in 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, to reduce the risk of further introduction, inspect all borrow pits before use and transport of rock to the units or new roads. See Krosse 2017 for all BMP's.

FISHERIES

Stream Num.: 123_1.1L
Stream Class: I
Channel Type: PAS
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class I for PAS: 100 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater
Concerns: N/A

Stream Num.: 123_1.1L.1R
Stream Class: I

Unit 242

Channel Type: PAB
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class I for PAB: 100 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater
Concerns: N/A

Stream Num.: 123_1.2L
Stream Class: I
Channel Type: MMS, PAB
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class I for MMS: 120 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater
Class I for PAB: 100 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater
Concerns: N/A

Stream Num.: 123_1.2L.1R
Stream Class: I
Channel Type: HCM
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class I for HCM: 100 feet or to the top of the side slope break, whichever is greater
Concerns: N/A

All Streams Protection/Mitigation Actions by Category:
All Categories implement BMPs
Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers.

Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers.

Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.

ROAD/STREAM CROSSING SUMMARY

There are two small culverts specified for the temporary road to this unit. These crossings are expected to be for non-streams. Should temporary road locations be changed such that different streams would be crossed, structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3, 14.5 and AqEco-4.

GEOLOGY/KARST

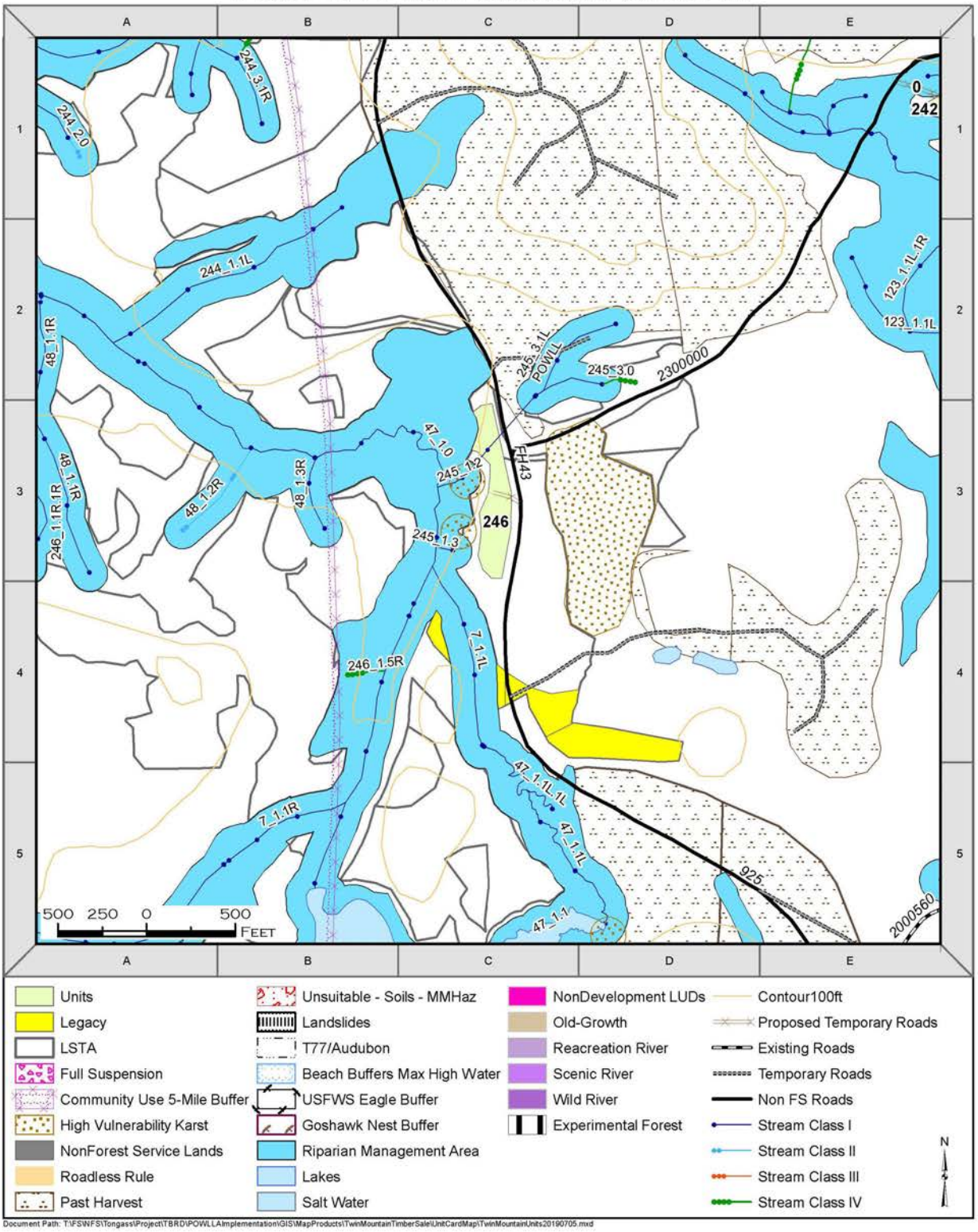
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.

HERITAGE RESOURCES

A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.

Unit 242
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes are gentle to 55%. The soils and wetlands are suitable for shovel yarding. Follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMPs 12.5 and 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). Forested wetlands are dominant in the unit (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4). The temporary roads traverse about a 0.1 acres of forested wetland outside of the unit. Wetland avoidance was not feasible due to the location of the existing road, lakes and streams, and tall sedge fens. Follow R10 BMPs12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 246



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Unit 246							
Unit Number:	246	**Total Harvest Unit Acres**	3.3	**Prescription:**	EA	**Harvest System:**	Shovel
VCU Number:	5710	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		73

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock in the overstory with lesser amounts of spruce and cedar irregularly distributed throughout. Stand structure is variable, containing breaks in the canopy from tree mortality and windthrow where a variety of trees sizes are found, but also has areas of continuous canopy cover where overstory trees are well-stocked. Trees range in size from small seedlings to large diameter dominant overstory individuals. This stand is mature with moderate stem decay and defect resulting in a situation where stand growth is being offset by decay. Snags and downed wooded are distributed throughout. The understory is predominantly blueberry with lesser amounts of rusty menziesia and red huckleberry. Forbs commonly found in old-growth are distributed throughout but in varied densities. This stand has varying levels of disease and decay throughout, ranging from light to heavy. Mistletoe infections are at trace levels. The risk for windthrow in this stand is moderate due to its timber type and exposure.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guidelines or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. A RAW buffer along the Class I stream buffers to the south and west of this unit and along two high vulnerability karst buffers was prescribed. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. Because the potential opening of the planned harvest unit was greater than 20 acres in size, legacy is designated for retention to meet this requirement (Forest Plan, page 4-68).

TIMBER/LOGGING

This unit is planned for shovel yarding to landings located along a proposed temporary road off of Alaska State Highway 43.

ENGINEERING/SYSTEM ROADS

Access via existing Alaska State Highway 43. New temporary road construction, 0.03 miles (BMPs 14.5, Road-3, Road-5, Road-6).

BOTANY

No botany concerns.

INVASIVE SPECIES

There are documented invasive plant infestations near this unit, including an infestation of *Cirsium arvense* (Canada thistle) located along Alaska State Highway 43. Additional site specific design features may be recommended to reduce the spread and introduction of these weeds into new roadbeds or into recently harvested habitat. Both of these plants pose a high risk for spread. Follow the Invasive Plant Management's Weed BMP's (Krosse 2017) outlined in Activity Cards 13, 19, 23 and 24 in the POW LLA Final ROD (Appendix 1) to reduce the risk of introduction and spread. Most importantly, to reduce the risk of further introduction, inspect all borrow pits before use and transport of rock to the units or new roads.

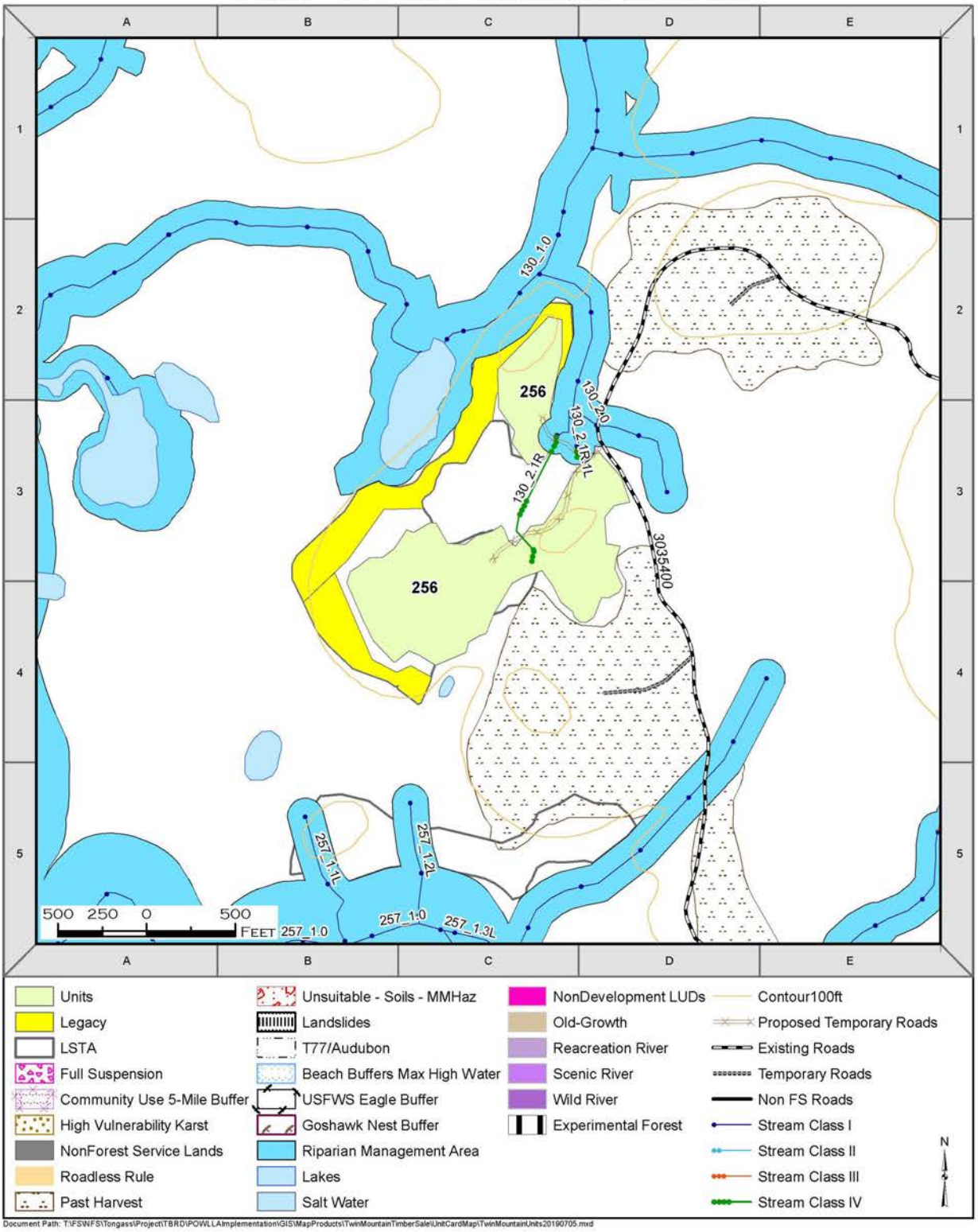
FISHERIES

Stream Num.: 47_1.0 (Gutchi Creek)
Stream Class: I
Channel Type: PAB
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class I for PAB: 100 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater
Concerns: Karst

Unit 246
Stream Num.: 245_1.2L Stream Class: I Channel Type: MMOk Protection: Category A Flagging: B/W Buffer (RMA): Class I for MMO: 120 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater Concerns: Karst fed Stream Num.: 245_1.3L Stream Class: I Channel Type: MMOk Protection: Category A Flagging: B/W Buffer (RMA): Class I for MMO: 120 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater Concerns: Karst fed
All Streams Protection/Mitigation Actions by Category: All Categories implement BMPs Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers. Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
There are no crossings planned tor the temporary road accessing this unit. Should temporary road/stream crossings be needed, crossing structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3 and 14.5.
GEOLOGY/KARST
Unit review and surveys have been completed. All of the unit is underlain by karst. High vulnerability features along the western side of the unit have been excluded. The karst is of moderate vulnerability. A harvest method that obtains partial suspension is required on the moderate vulnerability karst.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.

Unit 246
SOILS/WETLANDS
Slopes are less than 35%. The unit is suitable for shovel yarding and should follow the shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMP 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). The proposed temporary road does not cross any wetland. Follow R10 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
Goshawk surveys required in May or June have not been completed. The surveys required for May or June must be completed prior to implementation. Goshawk surveys for July or August have been completed. This unit cannot be expanded to the west without consulting a wildlife biologist. All resource-specific protections and mitigations will be applied before harvest activities are implemented.

POW LLA Twin Mountain Unit 256



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Unit 256							
Unit Number:	256	**Total Harvest Unit Acres**	24.1	**Prescription:**	EA	**Harvest System:**	Shovel
VCU Number:	5770	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		541

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock with a strong component of redcedar in the overstory, but also contain lesser amounts of spruce and yellow-cedar. Stand structure is complex with small infrequent breaks in the canopy from overstory mortality and variable soil drainage. Tree sizes cover a wide range and stocking ranges from moderate-to-well stocked. Snags are common throughout and fairly well-distributed. The understory layer is moderately brushy, mainly blueberry, but has a strong component of rusty menziesia, and is unevenly distributed. Forbs commonly found in old-growth are distributed throughout. This stand is mature with heavy stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections are heavy and some insect damage has been noted in the overstory. The risk for windthrow in this stand is moderate due to its exposure to winds coming off adjacent muskegs and past harvest, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. Because the potential opening of the planned harvest unit was greater than 20 acres in size, legacy is designated for retention to meet this requirement (Forest Plan, page 4-68). No concerns were identified in this unit that would require a review for a RAW buffer.

TIMBER/LOGGING

This unit is planned for shovel yarding to landings located along two proposed temporary roads off of NFS road 3035400.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 3035400 (BMP 14.20, Road-4, Road-6). New temporary road construction, 0.26 miles (BMPs 14.5, Road-3, Road-5, Road-6).

BOTANY

No botany concerns.

INVASIVE SPECIES

No weeds are known from this area. To keep this area weed-free follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest. Specifically follow recommendations under Activity cards 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, inspect all borrow pits before use and transport of rock to the units or new roads.

FISHERIES

Stream Num.: 130_1.0
Stream Class: I
Channel Type: FPS, L
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class I for FPS: 130 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater
Class I for L: 100 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater
Concerns: N/A

Unit 256

Stream Num.: 130_2.0
Stream Class: I
Channel Type: MMO, LCS, PAB
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class I for MMO: 120 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater
Class I for LCS: 100 feet or to the top of the side-slope break; whichever is greater
Class I for PAB: 100 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater
Concerns: N/A

Stream Num.: 130_2.1R
Stream Class: I, IV
Channel Type: HCO, PAO
Protection: Category A and C
Flagging: B/W, G/W
Buffer (RMA):
Class I for HCO: 100 feet or to the top of the side-slope break; whichever is greater
Class IV for PAO: No buffer
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 130_2.1R.1L
Stream Class: I, IV
Channel Type: MMO
Protection: Category A and C
Flagging: B/W, G/W
Buffer (RMA):
Class I for MMO: 120 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater
Class IV for MMO: No buffer
Concerns: N/A

All Streams Protection/Mitigation Actions by Category:
All Categories implement BMPs
Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers.

Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers.

Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.

ROAD/STREAM CROSSING SUMMARY

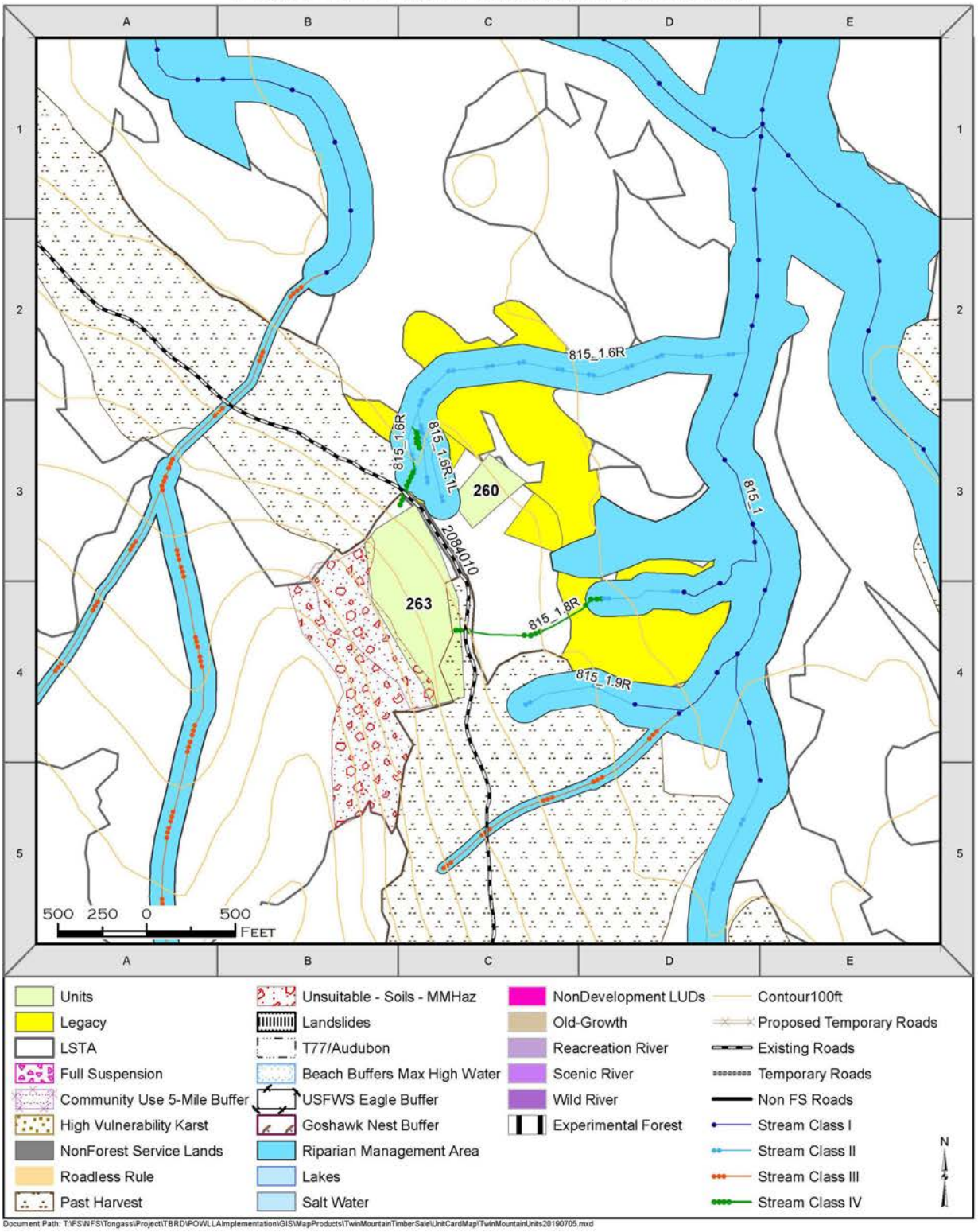
Two segments of temporary road access this unit with three Class IV crossings outside of the unit, and six non-stream crossings at unspecified locations. Should temporary road locations be changed such that different streams would be crossed, structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3, 14.5 and AqEco-4.

GEOLOGY/KARST

Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns

Unit 256
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes are gentle to 65%. The steeper slopes are located on small rock outcrops throughout the unit with the steepest occurring in the north. The soils and wetlands are suitable for shovel yarding. Follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMPs 12.5 and 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). Forested wetlands are dominant in the unit (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4). The temporary roads traverse about a 1 acre of forested wetland within the unit and about ½ acre of moss muskeg outside of the unit. Wetland avoidance was not feasible due to the location of the existing road, lakes and streams, and wetland abundance. Follow R10 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 260



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Unit 260							
Unit Number:	260	**Total Harvest Unit Acres**	2	**Prescription:**	CC	**Harvest System:**	Shovel
VCU Number:	5300	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		44

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are not defined by a single dominant overstory species, but rather by a mixture of many species. This stand predominantly contains western hemlock, redcedar, and yellow-cedar in varying degrees and densities. Spruce, mountain hemlock, and shorepine are also found but at low densities and infrequently. The stand structure is complex and the canopy is fairly broken throughout and due mainly to poor soil drainage but also tree mortality. Overstory trees vary in size but are smaller in diameter than other forest types, and moderately-to-poorly stocked. This stand is mature with moderate stem decay and defect resulting in a situation where stand growth is being offset by decay. Snags and downed wood are common throughout. The understory is moderate throughout because of breaks in the canopy and contains a variety of well-distributed shrubs and forbs. This stand has varying levels of disease and decay throughout, ranging from light to heavy. Mistletoe infections are light. The risk for windthrow in this stand is moderate.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guidelines or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. No concerns were identified in this unit that would require a review for a RAW buffer.

TIMBER/LOGGING

This unit is planned for shovel yarding to landings located along NFS road 2084010.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2084010 (BMP 14.20, Road-4, Road-6).

BOTANY

No restrictions for botany.

INVASIVE SPECIES

Weeds are in the area of the unit along NFSR 2084010. Follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest, but specifically in 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, to reduce the risk of further introduction, inspect all borrow pits before use and transport of rock to the units or new roads. See Krosse 2017 for all BMP's.

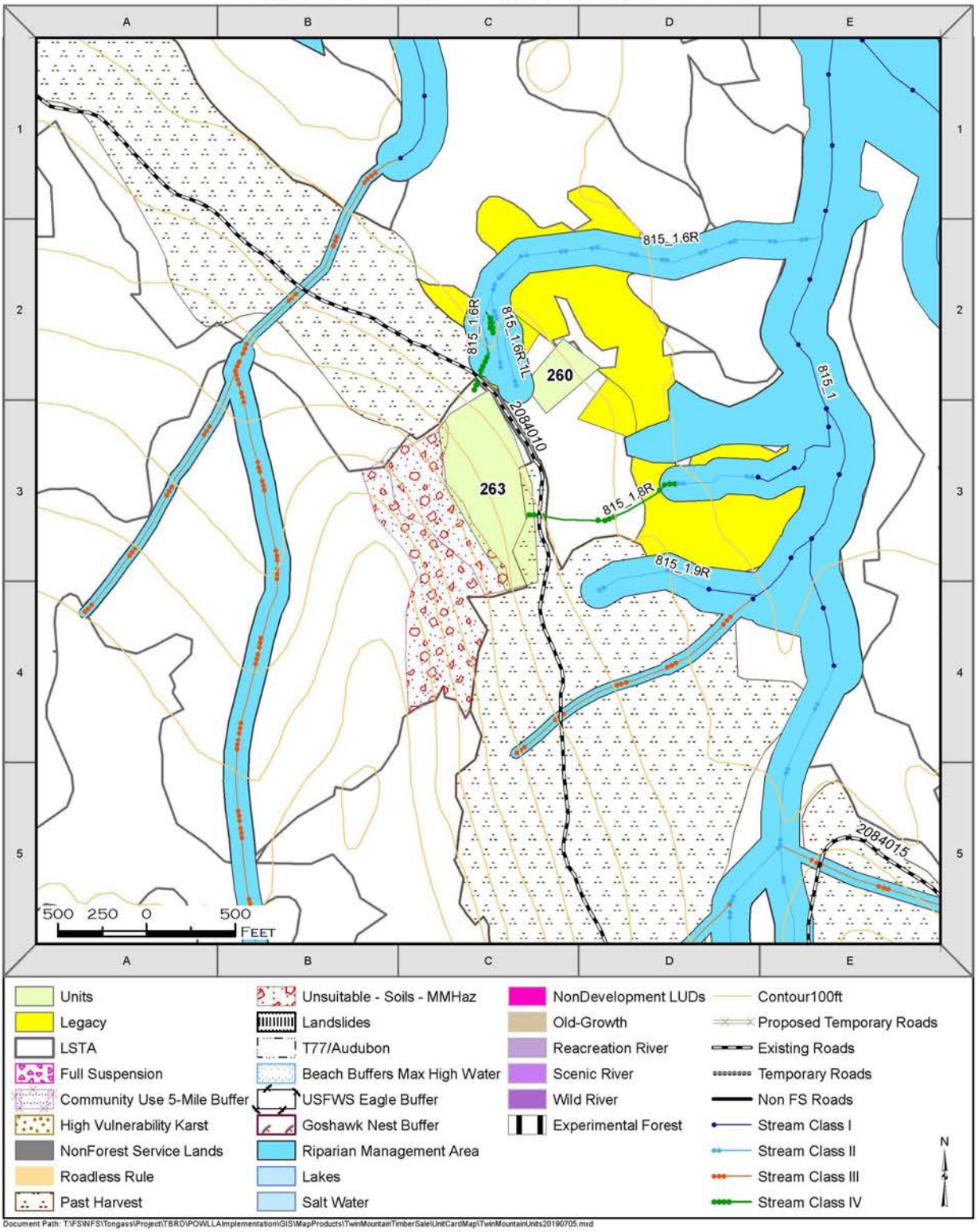
FISHERIES

Stream Num.: 815_1.6R
Stream Class: II, IV
Channel Type: HCO
Protection: Category A and C
Flagging: B/W, G/W
Buffer (RMA):
Class II for HCO: 100 feet or to the top of the side-slope break; whichever is greater
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 815_1.6R.1L
Stream Class: II
Channel Type: HCO
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class II for HCO: 100 feet or to the top of the side-slope break; whichever is greater

Unit 260
Concerns: N/A During the GIS process, some streams were not removed from the corporate layer and were not added to the unit cards.
All Streams Protection/Mitigation Actions by Category: All Categories implement BMPs Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers. Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
This unit is accessed by the reconstructed NFS 2084010 road, which does not have culvert work specified. No temporary road planned. Should temporary road/stream crossings be needed, crossing structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3 and 14.5.
GEOLOGY/KARST
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes are gentle to 65%. The steeper slopes are located on small rock outcrops throughout the unit. The soils and wetlands are suitable for shovel yarding. Follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMPs 12.5 and 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). Forested wetlands are dominant in the unit (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4).
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 263



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Unit 263							
Unit Number:	263	**Total Harvest Unit Acres**	8.9	**Prescription:**	EA	**Harvest System:**	Cable
VCU Number:	5300	**LUD:**	Modified Landscape		**Net Harvest Volume (MBF):**		200

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock in the overstory with lesser amounts of spruce and cedar irregularly distributed throughout. Stand structure is variable, containing breaks in the canopy from tree mortality and windthrow where a variety of trees sizes are found, but also has areas of continuous canopy cover where overstory trees are well-stocked. Trees range in size from small seedlings to large diameter dominant overstory individuals. This stand is mature with moderate stem decay and heavy defect resulting in a situation where stand growth is being offset by decay. Snags and downed wooded are distributed throughout. The understory is predominantly blueberry with lesser amounts of rusty menziesia and red huckleberry. Forbs commonly found in old-growth are distributed throughout but in varied densities. This stand has varying levels of disease and decay throughout, ranging from light to heavy. Mistletoe infections are light but present. The risk for windthrow in this stand is moderate due to existing stand and site characteristics, with windthrown trees predominantly occurring from the southeast but exposure to winds topographically being from the southwest, with the ridgeline direction creating an eddy effect.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guidelines or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. No concerns were identified in this unit that would require a review for a RAW buffer.

TIMBER/LOGGING

This unit is planned for downhill cable yarding to landings located along NFSR 2084010.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2084010 (BMP 14.20, Road-4, Road-6).

BOTANY

No restrictions for botany.

INVASIVE SPECIES

Weeds are in the area of the unit along NFSR 2084010. Follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest, but specifically in 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, to reduce the risk of further introduction, inspect all borrow pits before use and transport of rock to the units or new roads. See Krosse 2017 for all BMP's.

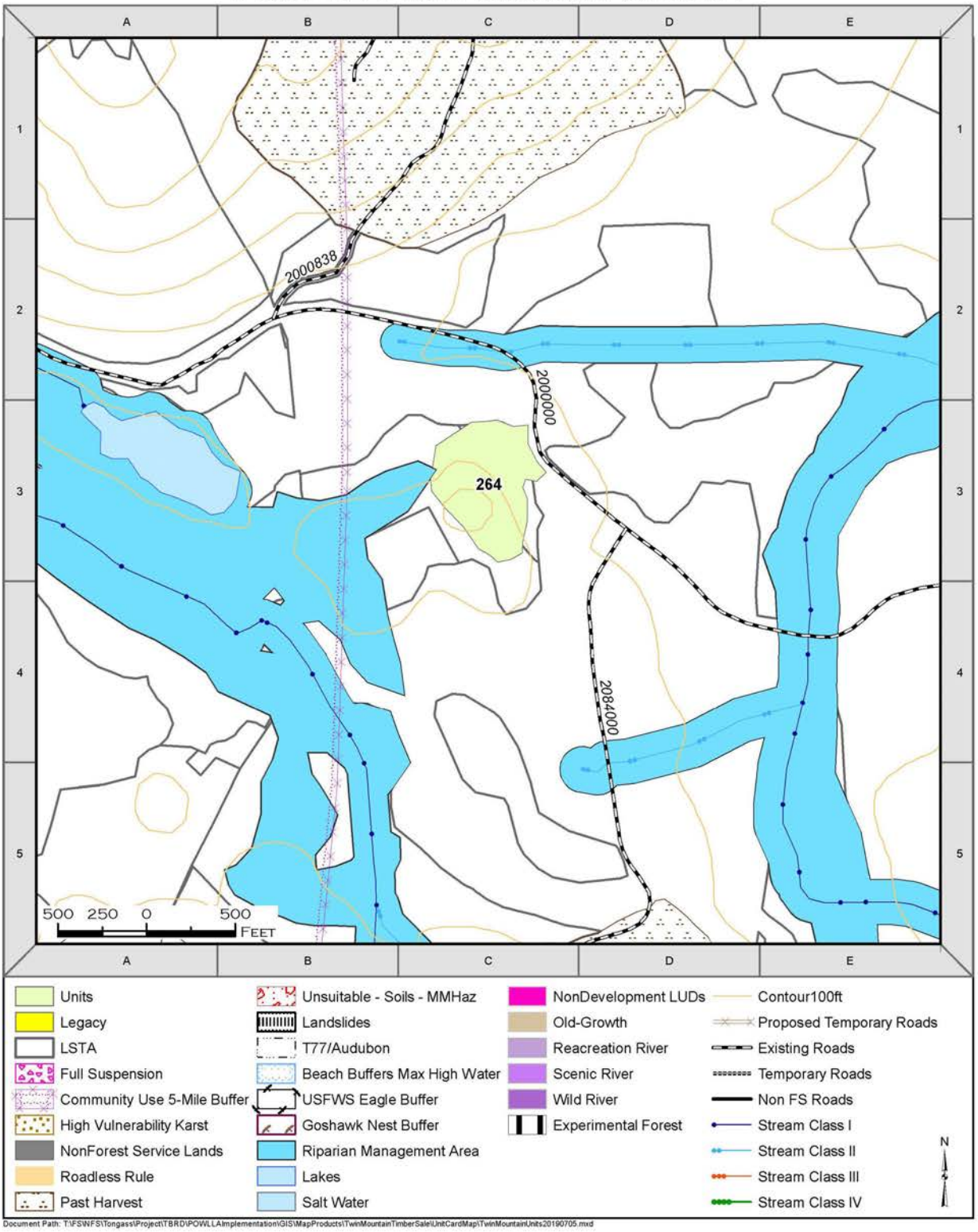
FISHERIES

Stream Num.: 815_1.6R
Stream Class: II, IV
Channel Type: HCO
Protection: Category A and C
Flagging: B/W, O/W
Buffer (RMA):
Class II for HCO: 100 feet or to the top of the side-slope break; whichever is greater
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 815_1.6R.1L
Stream Class: II
Channel Type: HCO
Protection: Category A

Unit 263
Flagging: B/W Buffer (RMA): Class II for HCO: 100 feet or to the top of the side-slope break; whichever is greater Concerns: N/A Stream Num.: 815_1.8R Stream Class: IV Channel Type: HCO Protection: Category C Flagging: G/W Buffer (RMA): Class IV for HCO: No buffer Concerns: N/A During the GIS process, some streams were not removed from the corporate layer and were not added to the unit cards.
All Streams Protection/Mitigation Actions by Category: All Categories implement BMPs Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers. Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
This unit is accessed by the reconstructed NFS 2084010 road, which does not have culvert work specified. No temporary road planned. Should temporary road/stream crossings be needed, crossing structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3 and 14.5.
GEOLOGY/KARST
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes range from 20% to 100%. All slopes greater than 72% are excluded from harvest consideration. About 16 acres of the unit is unsuitable for harvest consideration due to current and historic landslides, very steep slopes smooth slopes, and colluvial activity. The remainder of the unit is suitable for harvest with a minimum of partial suspension cable yarding and will meet soil and wetland resource concerns (R10 BMPS 12.5, 13.5, and 13.9 and National Core BMPs Plan-2, AqEco-2, AqEco-4, Veg-1, Veg-2, Veg-5, and Veg-6).
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 264



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Unit 264							
Unit Number:	264	**Total Harvest Unit Acres**	7.9	**Prescription:**	EA	**Harvest System:**	Shovel
VCU Number:	5300	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		176

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock with a strong component of yellow-cedar in the overstory, but also contains lesser amounts of spruce and redcedar. Stand structure is complex with breaks throughout the canopy from overstory mortality and variable soil drainage. Tree sizes cover a wide range and stocking ranges from moderate-to-well stocked. Yellow-cedar snags are common throughout, with lesser amounts of snags of different species. The understory layer is brushy, mainly blueberry but has a strong component of rusty menziesia, and is more evenly distributed throughout because of breaks in the canopy. Forbs commonly found in old-growth are distributed throughout. This stand is mature with moderate stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections were not noted in the overstory. The risk for windthrow in this stand is high due to its exposure to northerly winds coming off moderate due to its exposure to northerly winds coming off Buster Bay and Sumner Strait, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. No concerns were identified in this unit that would require a review for a RAW buffer.

TIMBER/LOGGING

This unit is planned for shovel yarding to landings located along NFSR 2000000.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2000000 (BMP 14.20, Road-4, Road-6).

BOTANY

No botany concerns.

INVASIVE SPECIES

Weeds are in the area of the unit along NFSR 2000000. Follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest, but specifically in 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, to reduce the risk of further introduction, inspect all borrow pits before use and transport of rock to the units or new roads. See Krosse 2017 for all BMP's.

FISHERIES

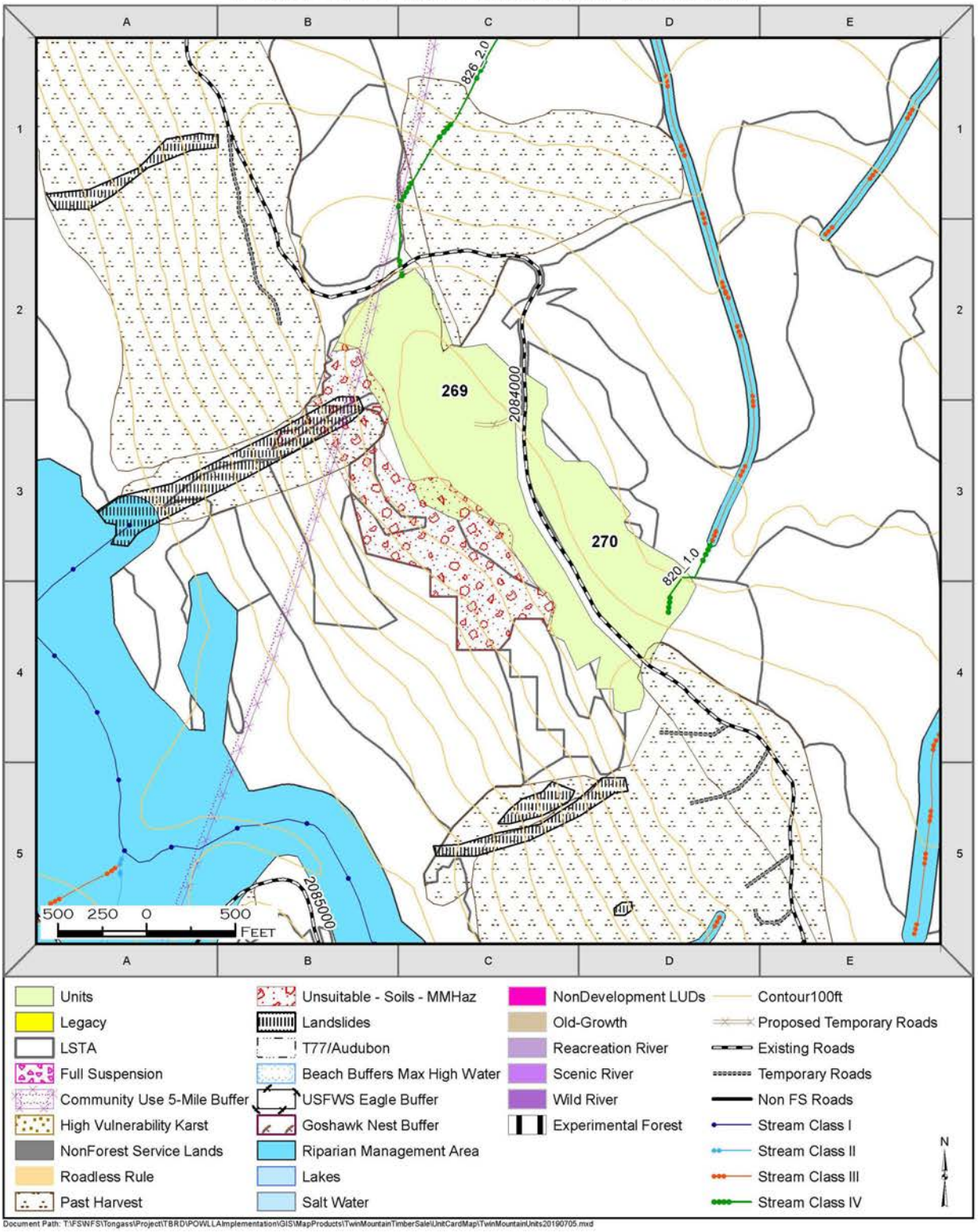
There are currently no mapped streams within 200ft of this unit. Notify the Fish Biologist or Hydrologist if new streams are discovered.

All Streams Protection/Mitigation Actions by Category:
All Categories implement BMPs
Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers.

Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers.

Unit 264
Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
No temporary roads planned. Should temporary road/stream crossings be needed, crossing structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3 and 14.5.
GEOLOGY/KARST
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns. Current GIS Geology shows ta portion of this unit as underlain by karst but this is in error.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes range from 10 to 50%. A small 1 acre area with slopes greater than 72% is located outside of the unit boundary. All slopes are suitable for harvest with shovel yarding and should follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMPs 12.5 and 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). Forested wetland is present intermixed throughout the unit (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4).
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 269



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Unit 269							
Unit Number:	269	**Total Harvest Unit Acres**	25.6	**Prescription:**	EA	**Harvest System:**	Shovel
VCU Number:	5290	**LUD:**	Modified Landscape		**Net Harvest Volume (MBF):**		574

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock in the overstory with lesser amounts of spruce and cedar irregularly distributed throughout. Stand structure is variable, containing breaks in the canopy from tree mortality and windthrow where a variety of trees sizes are found, but also has areas of continuous canopy cover where overstory trees are well-stocked. Trees range in size from small seedlings to large diameter dominant overstory individuals. Snags and downed wood are distributed throughout. The understory is predominantly blueberry with lesser amounts of rusty menziesia and red huckleberry. Forbs commonly found in old-growth are distributed throughout but in varied densities. This stand is mature with moderate stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections in the overstory are light. The risk for windthrow in this stand is moderate due to its exposure to winds coming off adjacent past harvest, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. No concerns were identified in this unit that would require a review for a RAW buffer.

TIMBER/LOGGING

This unit is planned for shovel yarding to a proposed temporary road off of NFS road 2084000 and to landings located along NFS road 2084000.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2084000 (BMP 14.20, Road-4, Road-6). New temporary road construction, 0.06miles (BMPs 14.5, Road-3, Road-5, Road-6).

BOTANY

No restrictions for botany.

INVASIVE SPECIES

No weeds are known from this area in GIS, but no recent surveys were conducted. To keep this area weed-free follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest. Specifically follow recommendations under Activity Cards 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly inspect all borrow pits before use and transport of rock to the units or new roads.

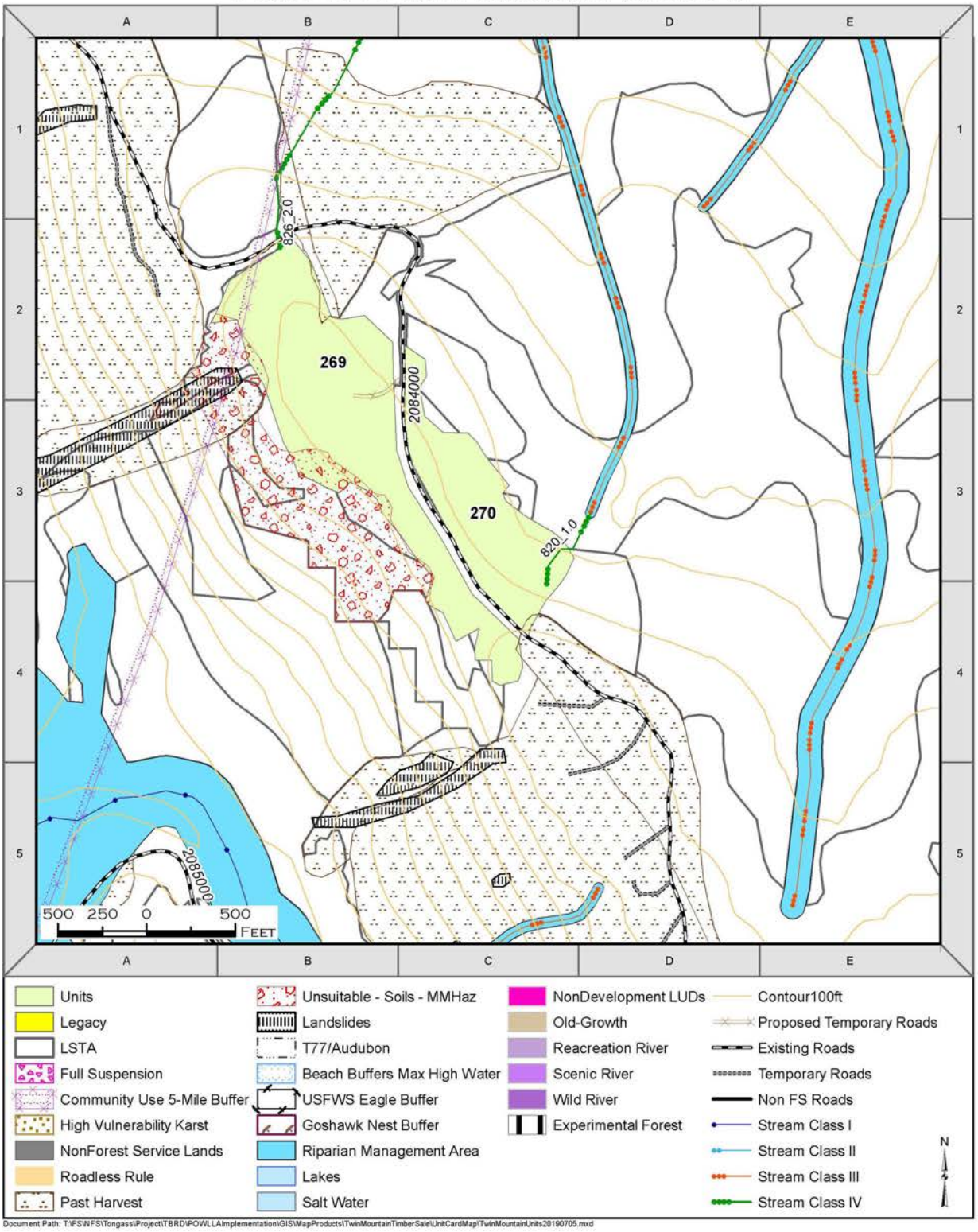
FISHERIES

Stream Num.: 826_2.0
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

All Streams Protection/Mitigation Actions by Category:
All Categories implement BMPs
Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers.

Unit 269
Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
This unit is accessed by the reconstructed NFS 2084000 road, which does not have culvert work specified. Temporary roads has no specified culvert work. Should temporary road/stream crossings be needed, crossing structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3 and 14.5.
GEOLOGY/KARST
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes range from 10 to 120%. About 19 acres on the western side of this unit are unsuitable for harvest consideration due to extremely steep, landslides, cliffs, saturated hollows, and colluvial activity. Minor areas less half an acre in size with slopes greater than 72% are suitable for harvest with partial suspension. All slopes in the remainder of the unit are suitable for harvest with shovel yarding and should follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMPs 12.5 and 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). The proposed temporary road does not cross any wetland. Follow R10 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 270



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Unit 270							
Unit Number:	270	**Total Harvest Unit Acres**	12.7	**Prescription:**	EA	**Harvest System:**	Shovel, Cable
VCU Number:	5300	**LUD:**	Modified Landscape		**Net Harvest Volume (MBF):**		286

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are not defined by a single dominant overstory species, but rather by a mixture of many species. This stand predominantly contains western hemlock, redcedar, and yellow-cedar in varying degrees and densities. Spruce, mountain hemlock, and shorepine are also found but at low densities and infrequently. The stand structure is complex and the canopy is fairly broken throughout and due mainly to poor soil drainage but also tree mortality. Overstory trees vary in size but are smaller in diameter than other forest types, and moderately-to-poorly stocked. This stand is mature with moderate stem decay and defect resulting in a situation where stand growth is being offset by decay. Snags and downed wood are common throughout. The understory is heavy throughout because of breaks in the canopy and contains a variety of well-distributed shrubs and forbs. This stand has varying levels of disease and decay throughout, ranging from light to heavy, with notable stem decay in the stand. Mistletoe infections are moderate in the hemlock. The risk for windthrow in this stand is moderate due to existing stand and site characteristics, with the wind exposure being from the southwest, but primary windthrow direction being from the southeast direction.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guidelines or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. No concerns were identified in this unit that would require a review for a RAW buffer.

TIMBER/LOGGING

This unit is planned for a combination of shovel and uphill cable yarding to landings located along NFSR 2084000.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2084000 (BMP 14.20, Road-4, Road-6).

BOTANY

No restrictions for botany.

INVASIVE SPECIES

No weeds are known from this area in GIS, but no recent surveys were conducted. To keep this area weed-free follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest. Specifically, follow recommendations under Activity Cards 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, inspect all borrow pits before use and transport of rock to the units or new roads.

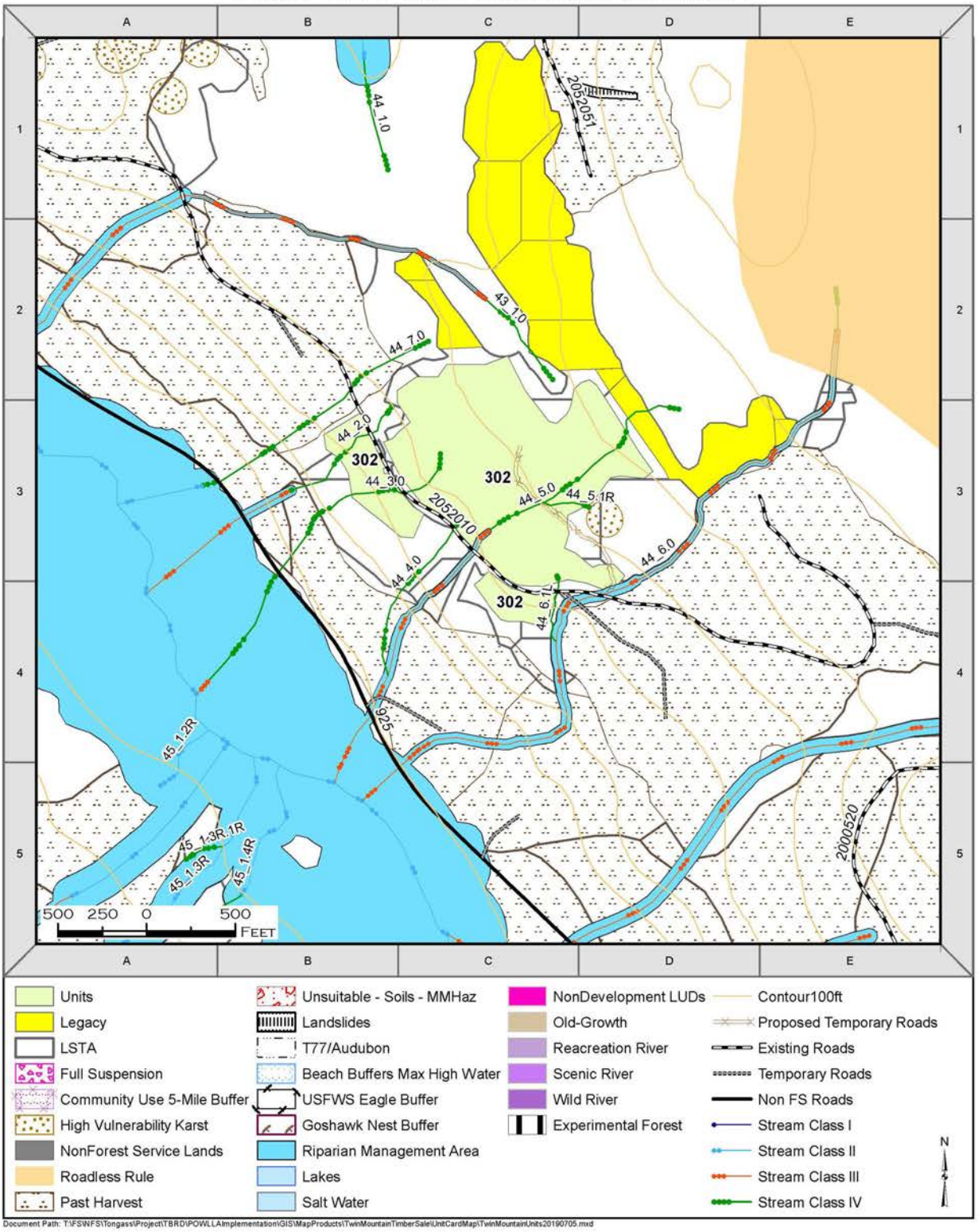
FISHERIES

Stream Num.: 820_1.0
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: Moderate Blowdown

All Streams Protection/Mitigation Actions by Category:
All Categories implement BMPs
Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers.

Unit 270
Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
This unit is accessed by the reconstructed NFS 2084000 road, which does not have culvert work specified. No temporary roads planned. Should temporary road/stream crossings be needed, crossing structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3 and 14.5.
GEOLOGY/KARST
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes range from 40 to 45% with benches and knobs throughout. Minor 50ft rock outcrops have slopes greater than 72%. All slopes in the unit are suitable for harvest with a minimum of partial suspension cable yarding and shovel yarding and will meet soil and wetland resource concerns (R10 BMPS 12.5, 13.5, and 13.9 and National Core BMPs Plan-2, AqEco-2, AqEco-4, Veg-1, Veg-2, Veg-5, and Veg-6). Shovel yarding on gentler slopes should follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMPs 12.5 and 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4).
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 302



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Unit 302							
Unit Number:	302	**Total Harvest Unit Acres**	32.1	**Prescription:**	EA	**Harvest System:**	Shovel
VCU Number:	5880	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		719

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock with a strong component of yellow-cedar in the overstory, but also contains lesser amounts of spruce and redcedar. Stand structure is complex with breaks throughout the canopy from overstory mortality and variable soil drainage. Tree sizes cover a wide range and stocking ranges from moderate-to-well stocked. Yellow-cedar snags are common throughout, with lesser amounts of snags of different species. The understory layer is brushy, mainly blueberry but has a strong component of rusty menziesia, and is more evenly distributed throughout because of breaks in the canopy. Forbs commonly found in old-growth are distributed throughout. This stand is mature with moderate stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections in the overstory are moderate. The risk for windthrow in this stand is moderate due to its exposure to winds coming off adjacent muskegs and past harvest, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. Because the potential opening of the planned harvest unit was greater than 20 acres in size, legacy is designated for retention to meet this requirement (Forest Plan, page 4-68). No concerns were identified in this unit that would require a review for a RAW buffer.

TIMBER/LOGGING

This unit is planned for shovel yarding to landings located off of NFS road 2052010 and temporary road off of NFS road 2052010.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2052010 (BMP 14.20, Road-4, Road-6). New temporary road construction, 0.22 miles (BMPs 14.5, Road-3, Road-5, Road-6).

BOTANY

No botany concerns.

INVASIVE SPECIES

No weeds are known from this area. To keep this area weed-free follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest. Specifically follow recommendations under Activity Cards 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, inspect all borrow pits before use and transport of rock to the units or new roads.

FISHERIES

Stream Num.: 43_1.0
Stream Class: IV
Channel Type: MMO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for MMO: No buffer
Concerns: N/A

Stream Num.: 44_2.0

Unit 302

Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 44_3.0
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 44_4.0
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 44_5.0
Stream Class: III, IV
Channel Type: HCO
Protection: Category B and C
Flagging: O/W, G/W
Buffer (RMA):
Class III for HCO: To the top of the side-slope break
Class IV for HCO: No buffer
Concerns: N/A

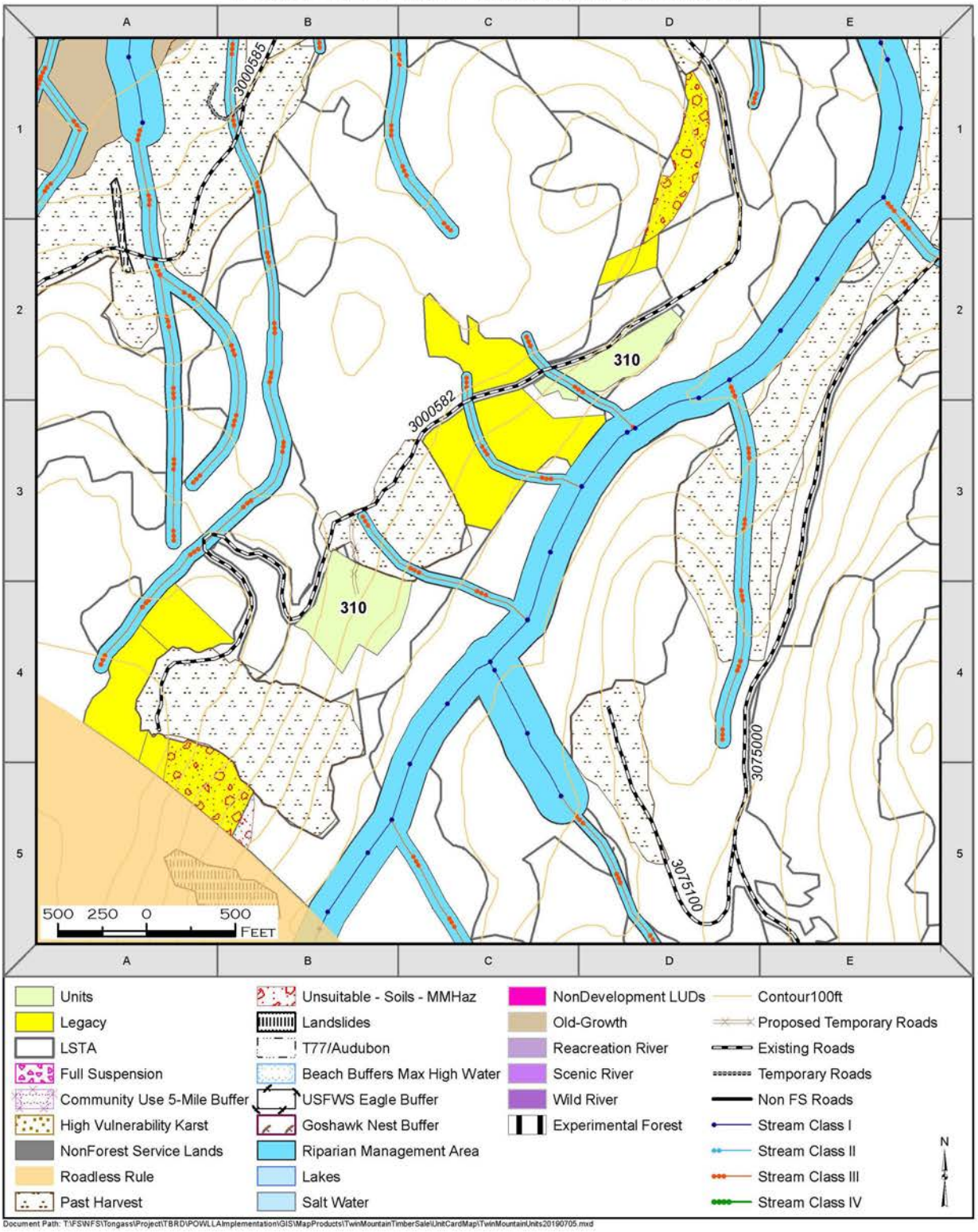
Stream Num.: 44_5.1R
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 44_6.0
Stream Class: III
Channel Type: HCM, HCO
Protection: Category B
Flagging: O/W
Buffer (RMA):
Class III for HCM: To the top of the side-slope break
Class III for HCO: To the top of the side-slope break
Concerns: N/A

Stream Num.: 44_6.1L
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):

Unit 302
Class IV for HCO: No buffer Concerns: N/A Stream Num.: 44_7.0 Stream Class: IV Channel Type: HCO Protection: Category C Flagging: G/W Buffer (RMA): Class IV for HCO: No buffer Concerns: N/A
All Streams Protection/Mitigation Actions by Category: All Categories implement BMPs Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers. Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
The NFS 2052010 road has two culvert replacements for non-stream of cross drain features. The temporary roads specified has two Class IV crossings and two non-stream crossings. Should temporary road locations be changed such that different streams would be crossed, structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3, 14.5 and AqEco-4.
GEOLOGY/KARST
Unit review and surveys have been completed. The unit partially underlain by karst. The remainder of the karst is low vulnerability. No special mitigation is required.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes range from 10 to 78%. The majority of the slopes are less than 55% with minor steeper areas. All slopes are suitable for harvest with shovel yarding and should follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMPs 12.5 and 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). Forested wetlands and forested wetland/ emergent short sedge are dominant in the unit (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4). The temporary road traverses about 1 acre of forested wetland and forested wetland/ emergent short sedge. Wetland avoidance was not feasible due to the location of the existing road, engineering constrains with steeper ground, and wetland abundance. Follow R10 BMPs12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 310



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Unit 310							
Unit Number:	310	**Total Harvest Unit Acres**	9.2	**Prescription:**	EA	**Harvest System:**	Cable
VCU Number:	5350	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		206

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock with a strong component of redcedar in the overstory, but also contain lesser amounts of spruce and yellow-cedar. Stand structure is complex with small infrequent breaks in the canopy from overstory mortality and variable soil drainage. Tree sizes cover a wide range and stocking ranges from moderate-to-well stocked. Snags are common throughout and fairly well-distributed. The understory layer is moderately brushy, mainly blueberry, but has a strong component of rusty menziesia, and is unevenly distributed. Forbs commonly found in old-growth are distributed throughout. This stand is mature with moderate stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections in the overstory are moderate. The risk for windthrow in this stand is moderate due to its exposure to winds coming off adjacent muskegs and past harvest, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. Because the potential opening of the planned harvest unit was greater than 20 acres in size, legacy is designated for retention to meet this requirement (Forest Plan, page 4-68). RAW buffers along a Class III stream within this unit were initially indicated, but no streams were found and so an additional buffer was determined to be unnecessary after field review by qualified specialists.

TIMBER/LOGGING

This unit is planned for uphill cable yarding to landings located along a proposed temporary road and off of NFS road 3000582.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 3000582 (BMP 14.20, Road-4, Road-6). New temporary road construction, 0.09 miles (BMPs 14.5, Road-3, Road-5, Road-6).

BOTANY

No restrictions for botany.

INVASIVE SPECIES

No weeds are known from this area in GIS, but no recent surveys were conducted. To keep this area weed-free follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest. Specifically follow recommendations under Activity Cards 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly inspect all borrow pits before use and transport of rock to the units or new roads.

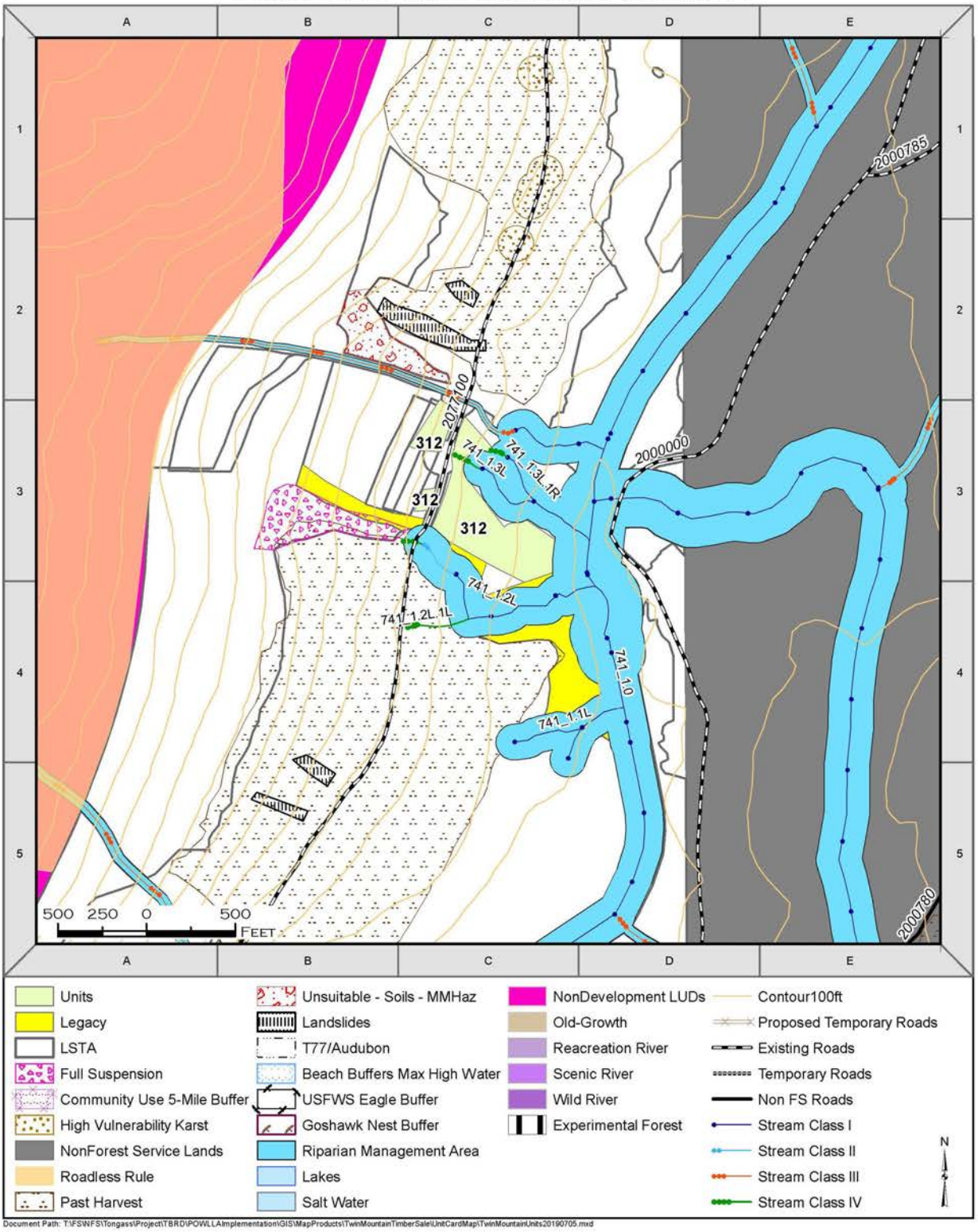
FISHERIES

Stream Num.: Map Location D-3 / C-3 (724_1.1R)
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO (mapped as Class III HCM): No buffer
Concerns: N/A

During the GIS process some streams were not removed from the corporate layer and were not included in the unit card text.

Unit 310
All Streams Protection/Mitigation Actions by Category: All Categories implement BMPs Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers. Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
This unit is accessed by the reconstructed NFS 3000582 road, which does not have culvert work specified. The temporary road does not have any stream crossings. Should temporary road locations be changed such that different streams would be crossed, structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3, 14.5 and AqEco-4.
GEOLOGY/KARST
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes range from 35 to greater than 72% in the southern polygon and 25 to 55% in the northern polygon. Approximately 7 acres were excluded from harvest consideration in the original polygon due to very steep cliffs, surface colluvial activity, landslides, and landslide prone terrain. All slopes within the unit boundary are suitable for harvest with a minimum of partial suspension cable yarding (R10 BMPS 12.5, 13.5, and 13.9 and National Core BMPs Plan-2, AqEco-2, AqEco-4, Veg-1, Veg-2, Veg-5, and Veg-6). Forested wetland is present on the gentle slopes (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4). The temporary road traverses about a ½ acre of forested wetland. Wetland avoidance was not feasible due to the location of the existing road, engineering constrains with steep ground, and wetland abundance. Follow R10 BMPs12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 312



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Unit 312							
Unit Number:	312	**Total Harvest Unit Acres**	7.3	**Prescription:**	EA	**Harvest System:**	Shovel
VCU Number:	5371	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		164

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock in the overstory with lesser amounts of spruce and cedar irregularly distributed throughout. Stand structure is variable, containing breaks in the canopy from tree mortality and windthrow where a variety of trees sizes are found, but also has areas of continuous canopy cover where overstory trees are well-stocked. Trees range in size from small seedlings to large diameter dominant overstory individuals. Snags and downed wood are distributed throughout. The understory is predominantly blueberry with lesser amounts of rusty menziesia and red huckleberry. Forbs commonly found in old-growth are distributed throughout but in varied densities. This stand is mature with light stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections were not noted in the overstory. The risk for windthrow in this stand is high due to its exposure to winds coming off adjacent past harvest, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. Because the potential opening of the planned harvest unit was greater than 20 acres in size, legacy is designated for retention to meet this requirement (Forest Plan, page 4-68). This unit may require a RAW review; need for a buffer would be evaluated prior to implementation.

TIMBER/LOGGING

This unit is planned for shovel yarding to landings located along NFS road 2077100.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2077100 (BMP 14.20, Road-4, Road-6).

BOTANY

No restrictions for botany.

INVASIVE SPECIES

No weeds are known from this area in GIS, but no recent surveys were conducted. To keep this area weed-free follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest. Specifically follow recommendations under Activity Cards 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly inspect all borrow pits before use and transport of rock to the units or new roads.

FISHERIES

Stream Num.: 741_1.0
Stream Class: I
Channel Type: FPM
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class I for FPM: 130 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater
Concerns: N/A

Stream Num.: 741_1.2L
Stream Class: I, II, IV
Channel Type: HCM, HCD

Unit 312

Protection: Category A and C
Flagging: B/W, G/W
Buffer (RMA):
Class I for HCM: 100 feet or to the top of the side-slope break; whichever is greater
Class II for HCD: 100 feet or to the top of the side-slope break; whichever is greater
Class IV for HCD: No buffer
Concerns: N/A

Stream Num.: 741_1.2L .1L
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 741_1.3L
Stream Class: I, IV
Channel Type: HCO
Protection: Category A and C
Flagging: B/W, G/W
Buffer (RMA):
Class I for HCO: 100 feet or to the top of the side-slope break; whichever is greater
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 741_1.3L.1R
Stream Class: I, IV
Channel Type: HCO
Protection: Category A and C
Flagging: B/W, G/W
Buffer (RMA):
Class I for HCO: 100 feet or to the top of the side-slope break; whichever is greater
Class IV for HCO: No buffer
Concerns: N/A

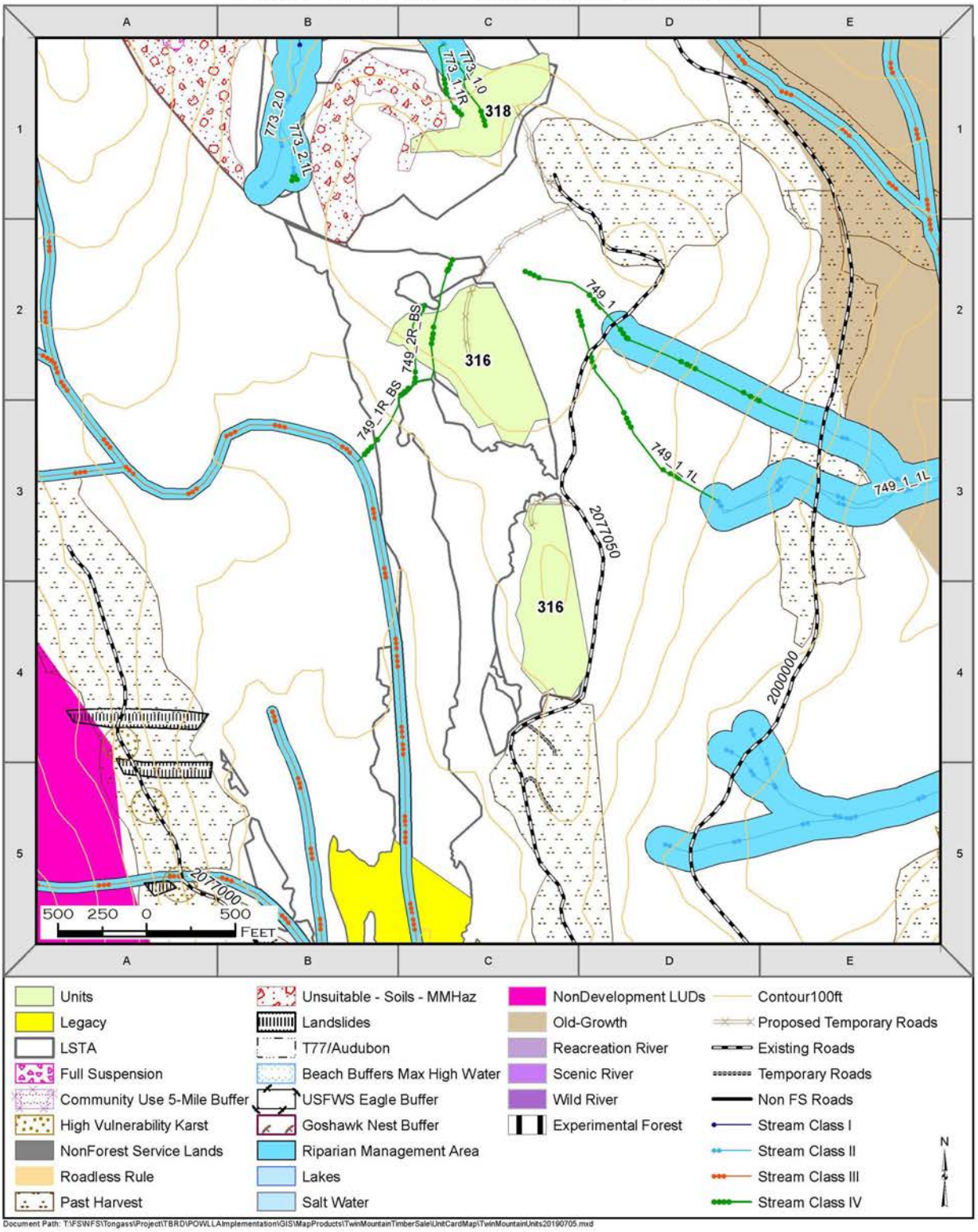
Stream Num.: Map Location D2 & C2 (741_1.4L)
Stream Class: I, III
Channel Type: HCO
Protection: Category A and B
Flagging: B/W, O/W
Buffer (RMA):
Class I for HCO: 100 feet or to the top of the side-slope break; whichever is greater
Class III for HCO: to the top of the side-slope break
Concerns: N/A

All Streams Protection/Mitigation Actions by Category:
All Categories implement BMPs
Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers.

Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers.

Unit 312
Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
This unit is accessed by the reconstructed NFS 2077000 and NFS 2077100 roads. The 207700 road has one Class III and two Class IV stream crossings, and the 2077100 has one Class III stream crossing and 15 Class IV, non-stream or cross drains re-installed (AqEco-4). There are no temporary roads planned. Should temporary road/stream crossings be needed, crossing structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3 and 14.5.
GEOLOGY/KARST
Unit review and surveys have been completed. The unit partially underlain by karst. The vulnerability of the karst is low. No special mitigation is necessary. There are no known karst and cave resource concerns.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes range from 35 to greater than 72%. Small 25 to 75ft cliffs are located throughout the unit. The steeper ground is located in the northern half. A small landslide was identified east of the road on 55% slopes. Split yarding is recommended. Approximately 3 acres were excluded from harvest consideration due to very steep cliffs and surface colluvial activity into a stream to the north of the unit boundary. Outside of the southwest boundary there are 3 acres that are only suitable for harvest with full suspension. All slopes within the current unit boundary are suitable for harvest with a minimum of partial suspension cable yarding (R10 BMPS 12.5, 13.5, and 13.9 and National Core BMPs Plan-2, AqEco-2, AqEco-4, Veg-1, Veg-2, Veg-5, and Veg-6). Forested wetland is present on the gentle slopes (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4).
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 316



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Unit 316							
Unit Number:	316	**Total Harvest Unit Acres**	16.9	**Prescription:**	EA	**Harvest System:**	Shovel
VCU Number:	5340, 5371	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		378

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock with a strong component of yellow-cedar in the overstory, but also contains lesser amounts of spruce and redcedar. Stand structure is complex with breaks throughout the canopy from overstory mortality and variable soil drainage. Tree sizes cover a wide range and stocking ranges from moderate-to-well stocked. Yellow-cedar snags are common throughout, with lesser amounts of snags of different species. The understory layer is brushy, mainly blueberry but has a strong component of rusty menziesia, and is more evenly distributed throughout because of breaks in the canopy. Forbs commonly found in old-growth are distributed throughout. This stand is mature with moderate stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections in the overstory are moderate. The risk for windthrow in this stand is moderate due to its exposure to winds coming off adjacent muskegs and past harvest, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. Part of this unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. Because the portion of planned harvest in the legacy VCU had a potential opening of greater than 20 acres in size, legacy is designated for retention to meet this requirement (Forest Plan, page 4-68). No concerns were identified in this unit that would require a review for a RAW buffer.

TIMBER/LOGGING

This unit is planned for shovel yarding to landings located along three temporary roads and off of NFS road 2077050.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2077050 (BMP 14.20, Road-4, Road-6). New temporary road construction, 0.34 miles (BMPs 14.5, Road-3, Road-5, Road-6).

BOTANY

No botany concerns.

INVASIVE SPECIES

No weeds are known from this area. To keep this area weed-free follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest. Specifically follow recommendations under Activity cards 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, inspect all borrow pits before use and transport of rock to the units or new roads.

FISHERIES

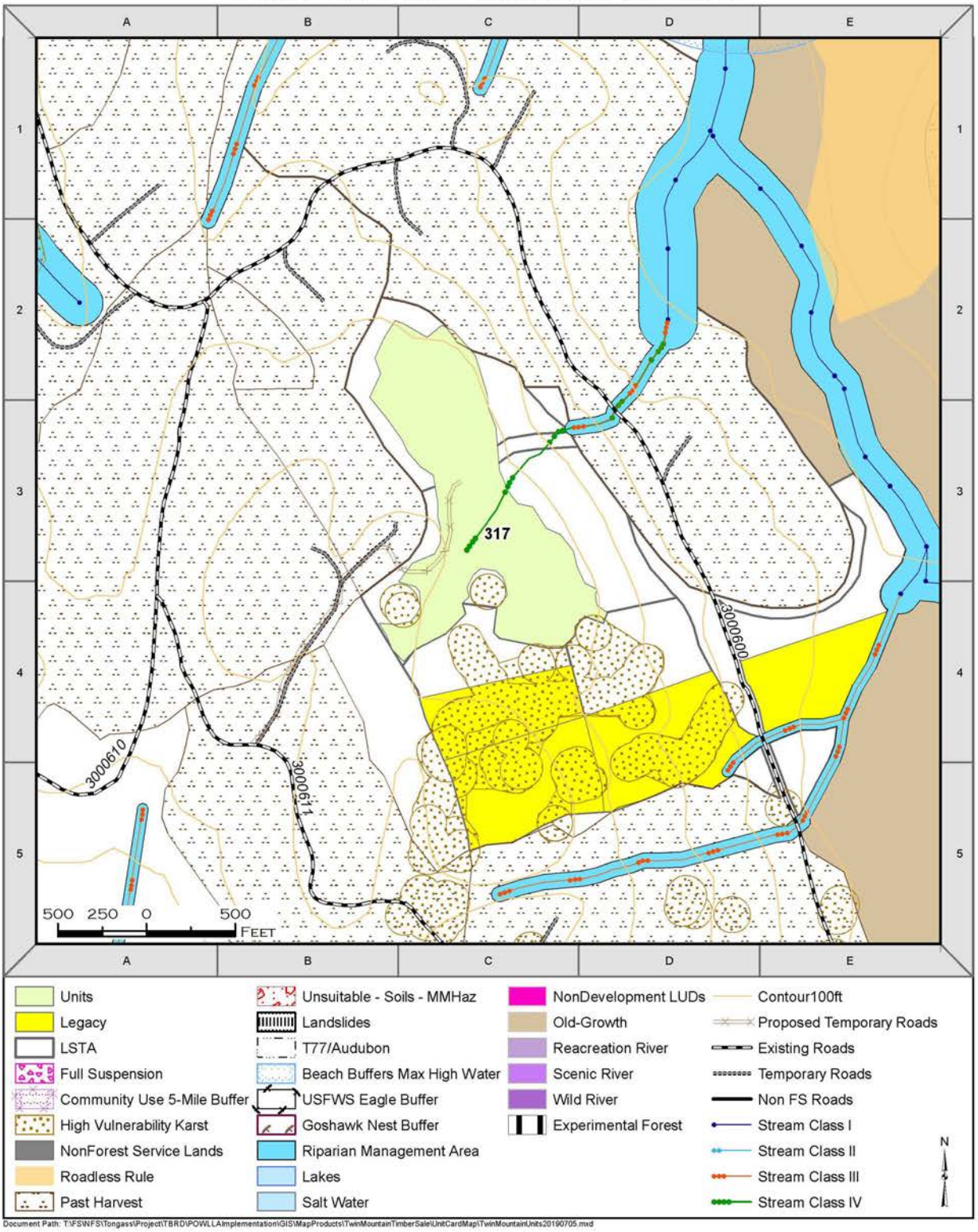
Stream Num.: 749_1
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 749_1R_BS
Stream Class: IV

Unit 316
Channel Type: HCO Protection: Category C Flagging: G/W Buffer (RMA): Class IV for HCO: No buffer Concerns: N/A Stream Num.: Map Location B-2 (NE_749_2R_BS) Stream Class: IV Channel Type: HCO Protection: Category C Flagging: G/W Buffer (RMA): Class IV for HCO: No buffer Concerns: N/A
All Streams Protection/Mitigation Actions by Category: All Categories implement BMPs Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers. Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
This unit is accessed by the reconstructed NFS 2077050 road which does not have culvert work specified. There are three proposed temporary roads. One temporary road crosses a wetland area and has five culverts planned for non-stream crossings or drainage relief at unspecified locations. The other two temporary roads do not have culvert work specified. Should temporary road locations be changed such that different streams would be crossed, structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3, 14.5 and AqEco-4.
GEOLOGY/KARST
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.

Unit 316
SOILS/WETLANDS
Slopes are gentle to 55% with many 50ft knobs with slopes up to 80%. The soils and wetlands are suitable for shovel yarding due to benches and existing road allowing for operability. Follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMPs 12.5 and 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). Forested wetlands are located in the western fringes of the polygons in the unit (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4). The proposed temporary roads cross about ¾ of a mile of forested wetland/ emergent short sedge and about ¼ mile of forested wetland. Wetland avoidance was not feasible due to steeper terrain adjacent to the existing road. Follow R10 BMPs12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 317



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Unit 317							
Unit Number:	317	**Total Harvest Unit Acres**	25.8	**Prescription:**	EA	**Harvest System:**	Shovel
VCU Number:	5350	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		578

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock with a strong component of redcedar in the overstory, but also contain lesser amounts of spruce and yellow-cedar. Stand structure is complex with small infrequent breaks in the canopy from overstory mortality and variable soil drainage. Tree sizes cover a wide range and stocking ranges from moderate-to-well stocked. Snags are common throughout and fairly well-distributed. The understory layer is moderately brushy, mainly blueberry, but has a strong component of rusty menziesia, and is unevenly distributed. Forbs commonly found in old-growth are distributed throughout. This stand is mature with moderate stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections in the overstory are light to moderate. The risk for windthrow in this stand is moderate to high due to its exposure to winds coming off adjacent past harvest, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. Because the potential opening of the planned harvest unit was greater than 20 acres in size, legacy is designated for retention to meet this requirement (Forest Plan, page 4-68). RAW buffers along a Class III stream within this unit were initially indicated, but no streams were found and so an additional buffer was determined to be unnecessary after field review by qualified specialists.

TIMBER/LOGGING

This unit is planned for shovel yarding to landings located along a proposed temporary road off of NFSR 3000611.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 3000611 (BMP 14.20, Road-4, Road-6) and temporary road construction on existing prism, 0.26 miles (BMPs 14.5, Road-3, Road-5, Road-6). New temporary road construction, 0.18 miles (BMPs 14.5, Road-3, Road-5, Road-6).

BOTANY

No botany concerns.

INVASIVE SPECIES

Weeds are in the area of the unit along NFSR 3000600. Follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest, but specifically in 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, to reduce the risk of further introduction, inspect all borrow pits before use and transport of rock to the units or new roads. See Krosse 2017 for all BMP's.

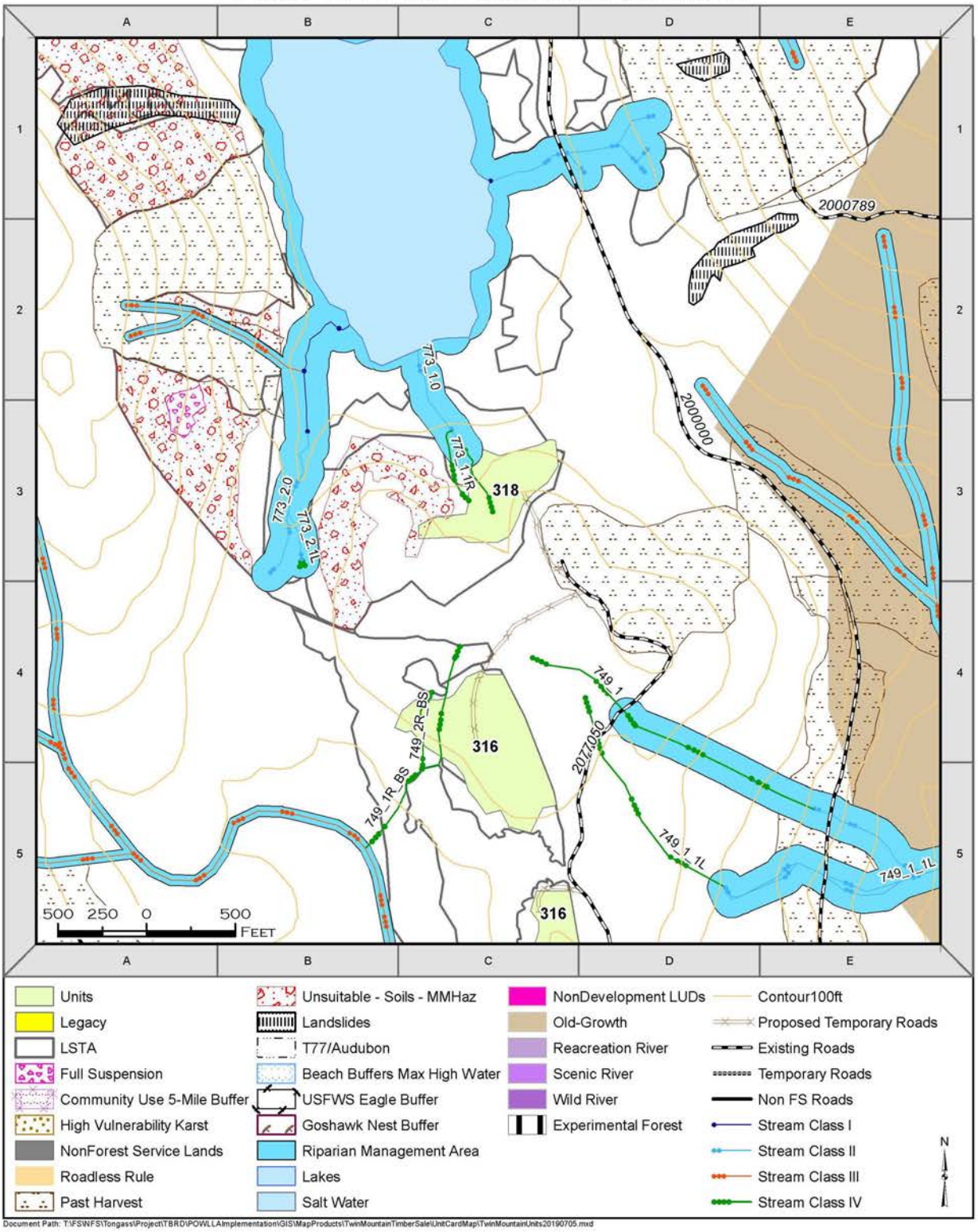
FISHERIES

Stream Num.: Map Location C-3 / D-3 (317_1)
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

All Streams Protection/Mitigation Actions by Category:
All Categories implement BMPs

Unit 317
Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers. Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
Access to this unit is by reconstructed NFS roads (3000600, 3000610, and 3000611) where no culvert work is specified. Reconstructed temporary road and new temporary road continue from the NFS 3000611, where one culvert is specified tor a Class IV or non-stream at an unspecified location. Should temporary road locations be changed such that different streams would be crossed, structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3, 14.5 and AqEco-4.
GEOLOGY/KARST
Unit has been reviewed for karst and cave resources. The entire unit is underlain by karst, the karst was determined to be of low-moderate vulnerability with inclusions of high vulnerability surrounding discrete karst features. Final unit layout excludes high vulnerability karst resources.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes range from gentle to greater than 65%. Terrain has many benches. The soils and wetlands are suitable for shovel yarding. Follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMPs 12.5 and 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). The proposed temporary road does not cross any wetland. Follow R10 BMPs12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 318



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Unit 318							
Unit Number:	318	**Total Harvest Unit Acres**	5.2	**Prescription:**	EA	**Harvest System:**	Shovel
VCU Number:	5330	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		117

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock in the overstory with lesser amounts of spruce and cedar irregularly distributed throughout. Stand structure is variable, containing breaks in the canopy from tree mortality and windthrow where a variety of trees sizes are found, but also has areas of continuous canopy cover where overstory trees are well-stocked. Trees range in size from small seedlings to large diameter dominant overstory individuals. Snags and downed wood are distributed throughout. The understory is predominantly blueberry with lesser amounts of rusty menziesia and red huckleberry. Forbs commonly found in old-growth are distributed throughout but in varied densities. This stand is mature with moderate stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections in the overstory are moderate. The risk for windthrow in this stand is moderate due to its exposure to winds coming off adjacent past harvest and nearby muskegs and lake, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. No concerns were identified in this unit that would require a review for a RAW buffer.

TIMBER/LOGGING

This unit is planned for shovel yarding to landings located along a proposed temporary road off of NFS road 2077050.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2077050 (BMP 14.20, Road-4, Road-6). New temporary road construction, 0.11 miles (BMPs 14.5, Road-3, Road-5, Road-6).

BOTANY

No restrictions for botany.

INVASIVE SPECIES

No weeds are known from this area in GIS, but no recent surveys were conducted. To keep this area weed-free follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest. Specifically, follow recommendations under Activity Cards 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly inspect all borrow pits before use and transport of rock to the units or new roads.

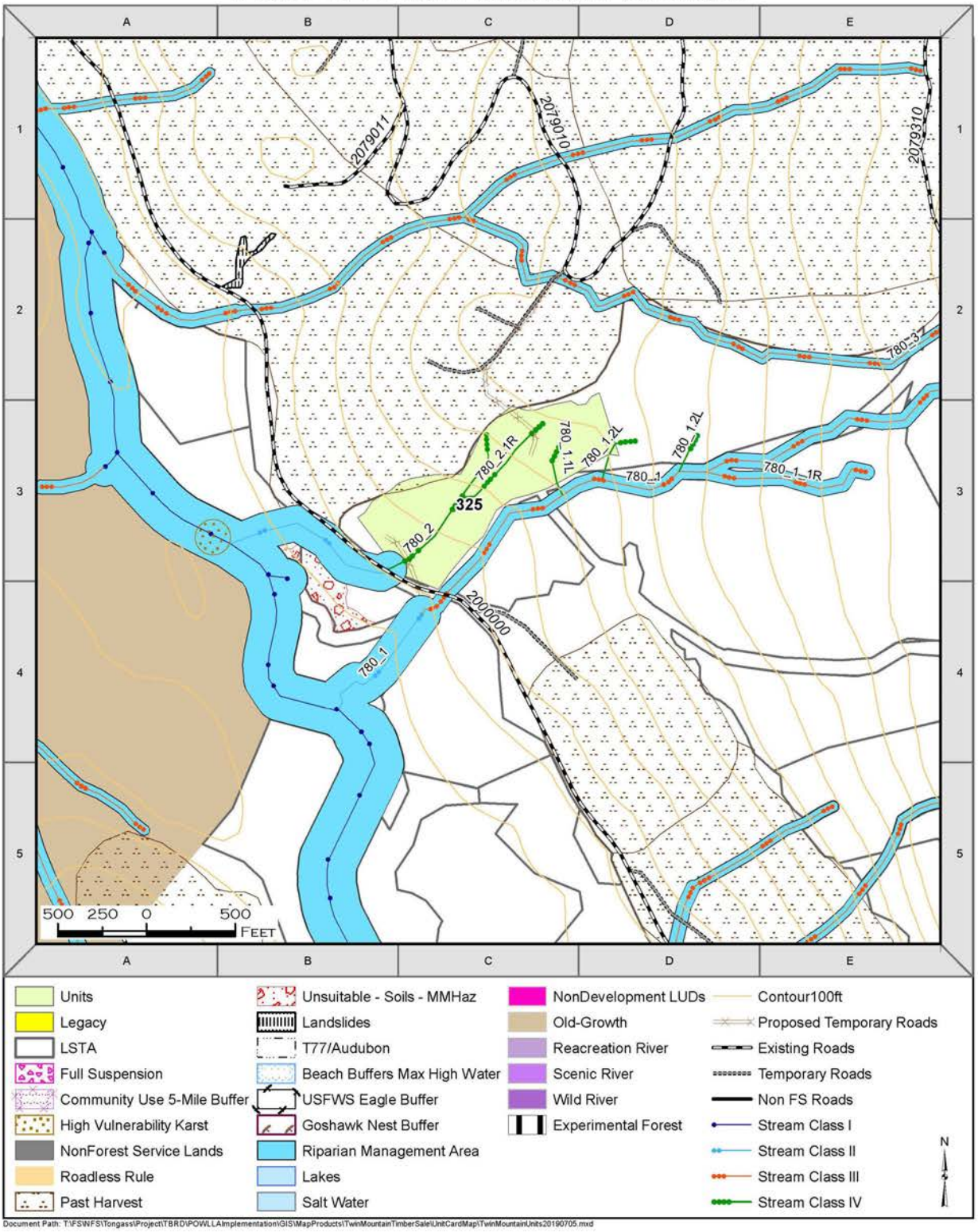
FISHERIES

Stream Num.: 773_1.0
Stream Class: II, IV
Channel Type: MMO, HCM, HCO
Protection: Category A and C
Flagging: B/W, G/W
Buffer (RMA):
Class II for MMO: 120 feet or to the extent of the riparian area, whichever is greater
Class II for HCM: 100 feet or to the top of the side-slope break, whichever is greater
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 773_1.1R
Stream Class: IV
Channel Type: HCM, HCO

Unit 318
Protection: Category B and C Flagging: O/W, G/W Buffer (RMA): Class IV with Category B protection for HCM: To the top of the side-slope break Class IV for HCO: No buffer Concerns: Class IV HCM receives Category B protection
All Streams Protection/Mitigation Actions by Category: All Categories implement BMPs Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers. Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
This unit is accessed by NFS 2077050 road and temporary road, neither have culvert work specified. Should temporary road/stream crossings be needed, crossing structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3 and 14.5.
GEOLOGY/KARST
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes range from gentle to greater than 72%. Approximately 8 acres were excluded from harvest consideration due to wet steep slopes, saturated hollows, historic landslides, and surface colluvial activity. Small minor areas greater than 72% are suitable in the eastern portion of the unit. The remainder of the slopes within the unit boundary are suitable for harvest with shovel yarding and should follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMPs 12.5 and 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4). The proposed temporary road does not cross any wetland. Follow R10 BMPs12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 325



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Unit 325							
Unit Number:	325	**Total Harvest Unit Acres**	15	**Prescription:**	EA	**Harvest System:**	Shovel, Cable
VCU Number:	5330	**LUD:**	Modified Landscape		**Net Harvest Volume (MBF):**		337

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock in the overstory with lesser amounts of spruce and cedar irregularly distributed throughout. Stand structure is variable, containing breaks in the canopy from tree mortality and windthrow where a variety of trees sizes are found, but also has areas of continuous canopy cover where overstory trees are well-stocked. Trees range in size from small seedlings to large diameter dominant overstory individuals. Snags and downed wood are distributed throughout. The understory is predominantly blueberry with lesser amounts of rusty menziesia and red huckleberry. Forbs commonly found in old-growth are distributed throughout but in varied densities. This stand is mature with light stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections were not noted in the overstory. The risk for windthrow in this stand is moderate due to its exposure to winds coming off adjacent past harvest, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. RAW buffers along the Class III stream along the unit were initially indicated but were determined to be unnecessary after field review by qualified specialists.

TIMBER/LOGGING

This unit is planned for a combination shovel, uphill, and downhill cable yarding to landings located along a proposed temporary road off of NFS road 2079010 and a proposed temporary road located off of NFS road 2000000.

ENGINEERING/SYSTEM ROADS

Access via existing NFS roads 2000000 and 2079010 (BMP 14.20, Road-4, Road-6). New temporary road construction, 0.33 miles (BMPs 14.5, Road-3, Road-5, Road-6).

BOTANY

No botany concerns.

INVASIVE SPECIES

Weeds are in the area of the unit along NFSR 2000000. Follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest, but specifically in 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, to reduce the risk of further introduction, inspect all borrow pits before use and transport of rock to the units or new roads. See Krosse 2017 for all BMP's.

FISHERIES

Stream Num.: 780_1
Stream Class: II, III
Channel Type: HCL, HCM
Protection: Category B
Flagging: O/W
Buffer (RMA):
Class II for HCL: 100 feet or to the top of the side-slope break; whichever is greater
Class III for HCM: To the top of the side-slope break
Concerns: N/A

Stream Num.: 780_1.1L
Stream Class: IV

Unit 325

Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 780_1.2L
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 780_2.0
Stream Class: II, IV
Channel Type: HCO
Protection: Category A and C
Flagging: B/W, G/W
Buffer (RMA):
Class II for HCO: 100 feet or to the top of the side-slope break; whichever is greater.
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 780_2.1R
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

All Streams Protection/Mitigation Actions by Category:
All Categories implement BMPs
Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers.

Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers.

Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.

ROAD/STREAM CROSSING SUMMARY

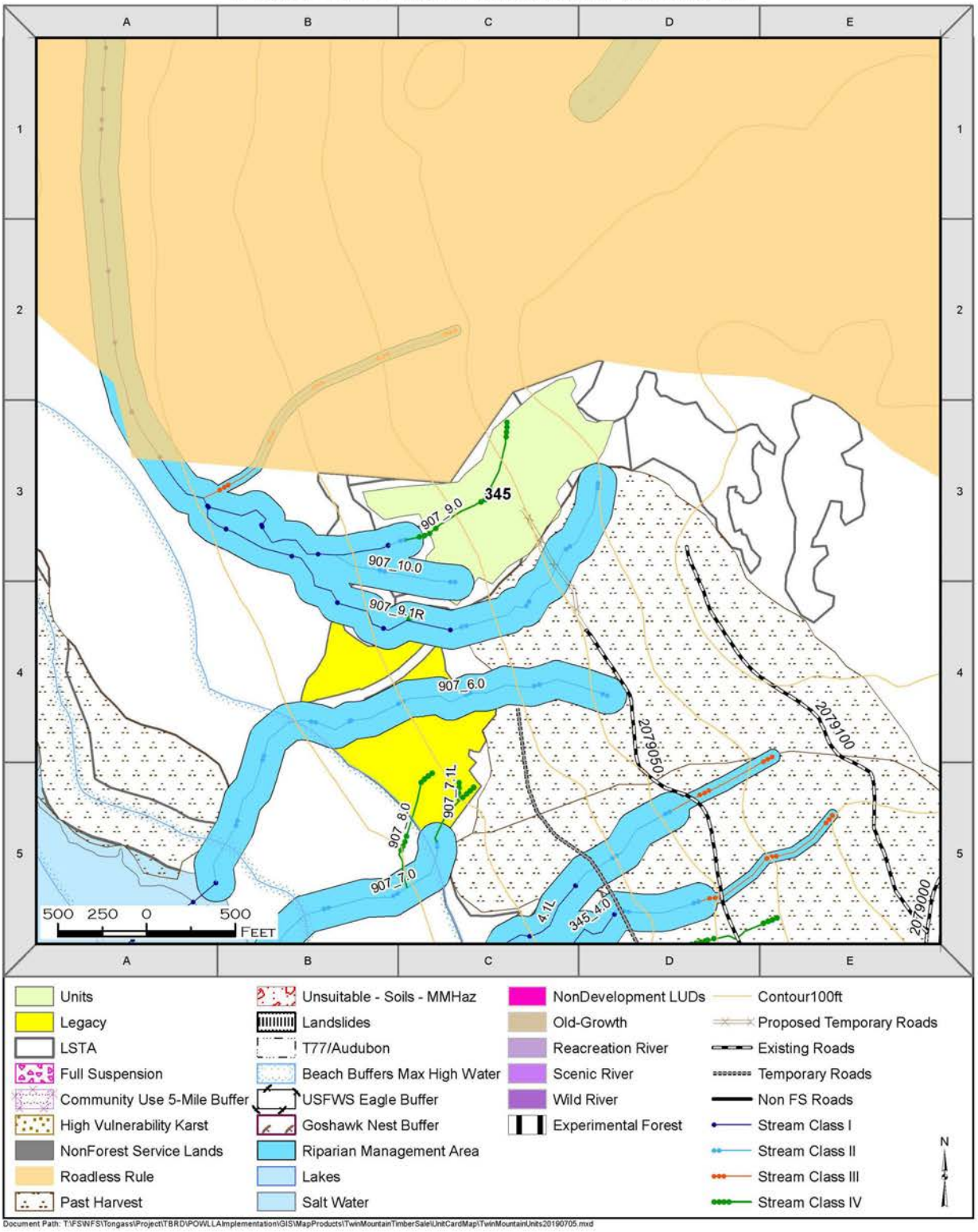
This unit is accessed by the reconstructed NFS 2079010 road, which does not have culvert work specified. There are two temporary road segments, a portion of the northern segment will be reconstructed. There are six culverts specified for Class IV or non-stream crossings at unspecified locations. Should temporary road locations be changed such that different streams would be crossed, structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3, 14.5 and AqEco-4.

GEOLOGY/KARST

Unit review and surveys have been completed. Some portions of the unit may be underlain by karst but it is deeply buried by glacial till. The karst vulnerability is low, no specific mitigation is required. No significant karst features were found in the unit.

Unit 325
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
This unit has an SIO of Moderate, is in Modified Landscape LUD, and has a low VAC (Visual Absorption Capacity). The unit was reduced to 15 acres from original layout as a result of scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
The majority of the unit is gentle to 55%. There are cliff bands in the unit 50 to 100ft in length with slopes 65 to 100% slopes. All slopes within the unit boundary are suitable for a minimum of partial suspension cable yarding and shovel yarding (R10 BMPS 12.5, 13.5, and 13.9 and National Core BMPs Plan-2, AqEco-2, AqEco-4, Veg-1, Veg-2, Veg-5, and Veg-6). Shovel yarding on gentler slopes should follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMPs 12.5 and 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). Forested wetland is present in about 1/3rd of the unit (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4). The proposed temporary roads traverse about a ½ acre of forested wetland outside of the unit and about 0.1 acres within the unit. Wetland avoidance was not feasible due to the locations of existing roads, small cliff bands, steep v-notches, and wetland abundance. Follow R10 BMPs12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 345



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Unit 345							
Unit Number:	345	**Total Harvest Unit Acres**	16.6	**Prescription:**	EA	**Harvest System:**	Shovel
VCU Number:	5320	**LUD:**	Modified Landscape		**Net Harvest Volume (MBF):**		373

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock with a strong component of redcedar in the overstory, but also contain lesser amounts of spruce and yellow-cedar. Stand structure is complex with small infrequent breaks in the canopy from overstory mortality and variable soil drainage. Tree sizes cover a wide range and stocking ranges from moderate-to-well stocked. Snags are common throughout and fairly well-distributed. The understory layer is moderately brushy, mainly blueberry, but has a strong component of rusty menziesia, and is unevenly distributed. Forbs commonly found in old-growth are distributed throughout. This stand is mature with light stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections in the overstory are moderate. The risk for windthrow in this stand is moderate to high due to its exposure to winds coming off Red Bay and adjacent past harvest, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. Because the potential opening of the planned harvest unit was greater than 20 acres in size, legacy is designated for retention to meet this requirement (Forest Plan, page 4-68). RAW buffers along the Class III stream in the unit were initially indicated but were determined to be unnecessary after field review by qualified specialists.

TIMBER/LOGGING

This unit is planned for shovel yarding to landings located along a proposed temporary road off of NFS road 2079050.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2079050 (BMP 14.20, Road-4, Road-6). New temporary road construction, 0.15 miles (BMPs 14.5, Road-3, Road-5, Road-6).

BOTANY

No botany concerns.

INVASIVE SPECIES

Weeds are in the area of the unit. Follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest, but specifically in 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, to reduce the risk of further introduction, inspect all borrow pits before use and transport of rock to the units or new roads. See Krosse 2017 for all BMP's.

FISHERIES

Stream Num.: 907_9.0
Stream Class: I, II, IV
Channel Type: HCL, HCO
Protection: Category A and C
Flagging: B/W, GW
Buffer (RMA):
Class I for HCL: 100 feet or to the top of the side-slope break; whichever is greater
Class II for HCO: 100 feet or to the top of the side-slope break; whichever is greater
Class IV for HCO: No buffer
Concerns: Moderate Blowdown

Unit 345

Stream Num.: 907_9.1R
Stream Class: I, II
Channel Type: HCL
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class I for HCL: 100 feet or to the top of the side-slope break; whichever is greater
Class II for HCL: 100 feet or to the top of the side-slope break; whichever is greater
Concerns: N/A

Stream Num.: Map Location C-4 (907_9.1R.1L)
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 907_10.0
Stream Class: II
Channel Type: HCO
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class II for HCO: 100 feet or to the top of the side-slope break; whichever is greater
Concerns: N/A

All Streams Protection/Mitigation Actions by Category:
All Categories implement BMPs
Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers.

Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers.

Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.

ROAD/STREAM CROSSING SUMMARY

This unit is accessed by the reconstructed NFS 2079050 road which calls for two Class III crossings, and 14 Class IV, non-stream or cross drain culverts re-installed. The temporary road that stems from NFS 2079050 road crosses one Class IV stream. Should temporary road locations be changed such that different streams would be crossed, structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3, 14.5 and AqEco-4.

GEOLOGY/KARST

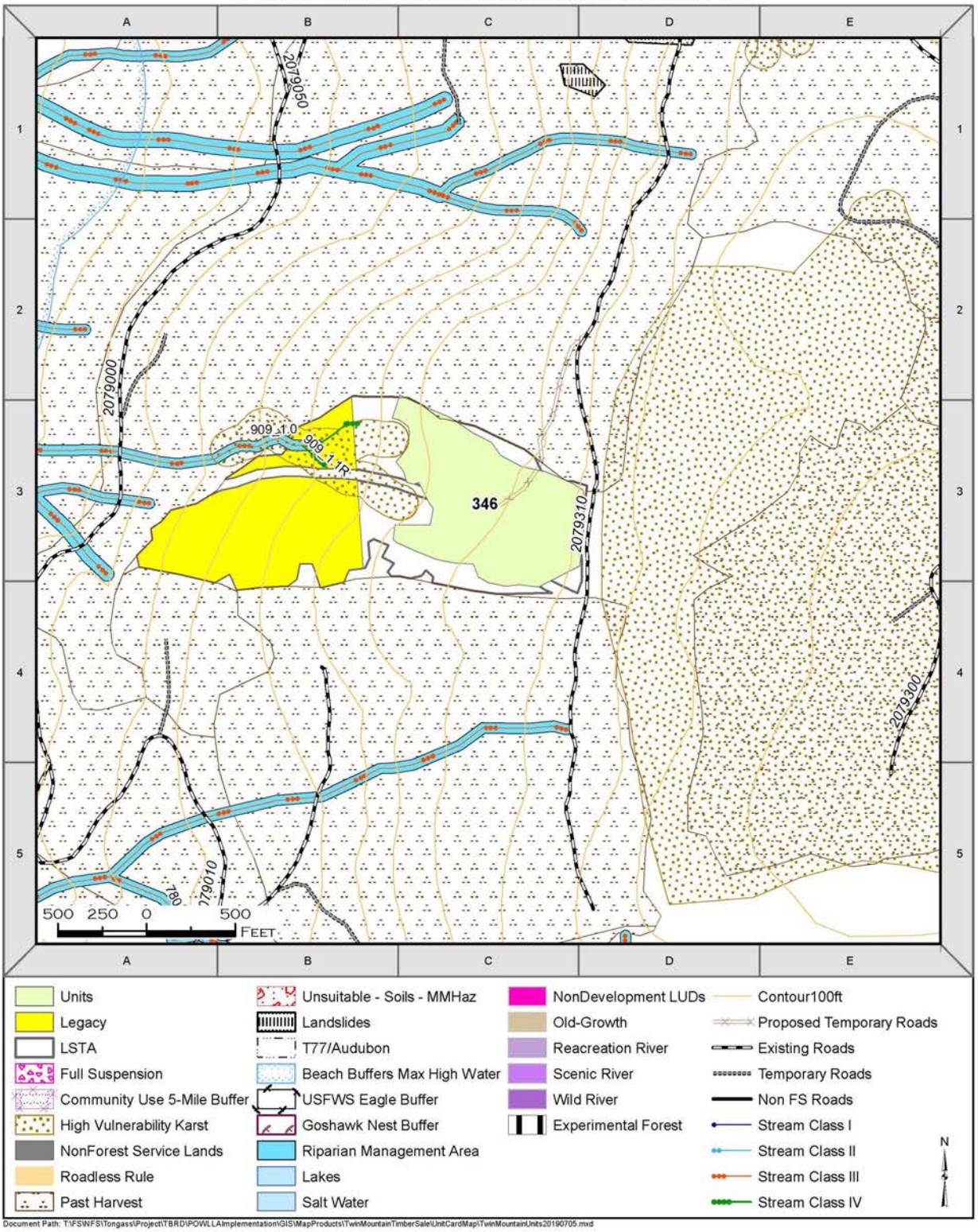
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.

HERITAGE RESOURCES

A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.

Unit 345
SCENERY
This unit has an SIO of Moderate, is in Modified Landscape LUD, and has a low VAC (Visual Absorption Capacity). The original layout had several other polygons nearby as part of the unit, but those are dropped. Final unit of 16.6 acres results in no scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes are gentle to 55%. All slopes within the unit boundaries are suitable with shovel yarding and should follow the shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMPs 12.5 and 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). The proposed road does not cross any wetland. Follow R10 BMPs12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 346



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Unit 346							
Unit Number:	346	**Total Harvest Unit Acres**	16.2	**Prescription:**	EA	**Harvest System:**	Shovel
VCU Number:	5320	**LUD:**	Modified Landscape		**Net Harvest Volume (MBF):**		363

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock in the overstory with lesser amounts of spruce and cedar irregularly distributed throughout. Stand structure is variable, containing breaks in the canopy from tree mortality and windthrow where a variety of trees sizes are found, but also has areas of continuous canopy cover where overstory trees are well-stocked. Trees range in size from small seedlings to large diameter dominant overstory individuals. Snags and downed wood are distributed throughout. The understory is predominantly blueberry with lesser amounts of rusty menziesia and red huckleberry. Forbs commonly found in old-growth are distributed throughout but in varied densities. This stand is mature with light stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections were not noted in the overstory. The risk for windthrow in this stand is high due to its exposure to winds coming off Red Bay and adjacent past harvest, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. Because the potential opening of the planned harvest unit was greater than 20 acres in size, legacy is designated for retention to meet this requirement (Forest Plan, page 4-68). RAW buffers for streams in this unit were initially indicated but were reclassified and remapped, and additional buffers were determined to be unnecessary after field review by qualified specialists.

TIMBER/LOGGING

This unit is planned for shovel yarding to landings located off of NFS road 2079310 and a proposed temporary road located off of NFS road 2079310.

ENGINEERING/SYSTEM ROADS

Access via existing NFS roads 2079010 and 2079310 (BMP 14.20, Road-4, Road-6). New temporary road construction, 0.22 miles (BMPs 14.5, Road-3, Road-5, Road-6).

BOTANY

No botany concerns.

INVASIVE SPECIES

Weeds are in the area of the unit. Follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest, but specifically in 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, to reduce the risk of further introduction, inspect all borrow pits before use and transport of rock to the units or new roads. See Krosse 2017 for all BMP's.

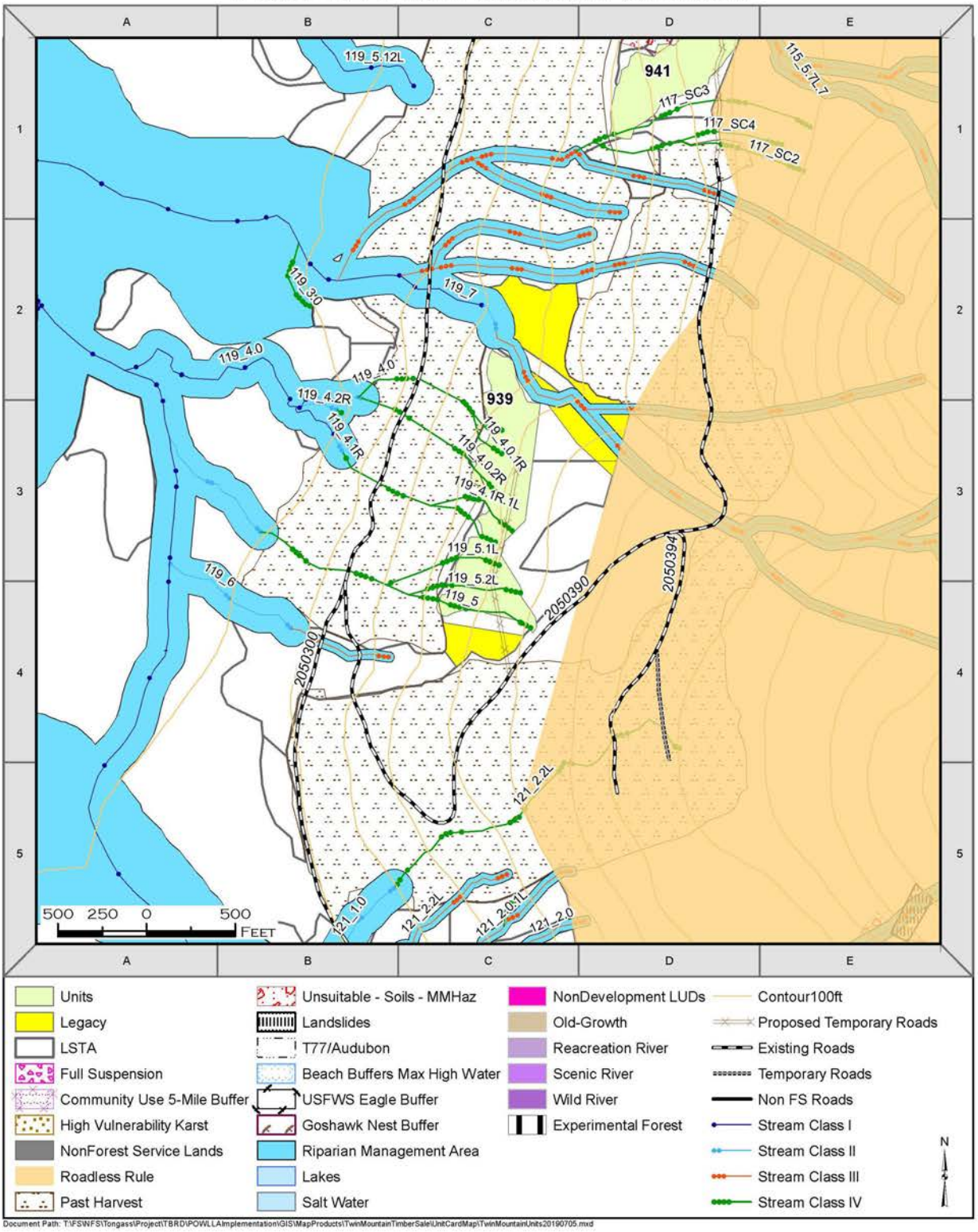
FISHERIES

Stream Num.: 909_1.0
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

All Streams Protection/Mitigation Actions by Category:
All Categories implement BMPs

Unit 346
Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers. Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
This unit is accessed by the reconstructed NFS 2079000 road which has one culvert replacement for a non-stream and the NFS 2079300 road has a relief drain for a spring that surfaces in the middle of the road. The temporary road crosses one non-stream, and one relic channel that warrants ditch relief type drainage. Should temporary road locations be changed such that different streams would be crossed, structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3, 14.5 and AqEco-4.
GEOLOGY/KARST
Unit has been reviewed for karst and cave resources. As traversed, the unit is underlain by moderate vulnerability karst. A harvest method that obtains partial suspension is required.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
This unit is shown to be both Moderate and Low SIO, and is in Modified Landscape LUD. It is both Low and Intermediate VAC. The unit size was reduced to less than 20 acres to address scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes are gentle to 55%. All slopes are suitable for harvest with shovel yarding and should follow the shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMPs 12.5 and 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4).
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 939



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Unit 939							
Unit Number:	939	**Total Harvest Unit Acres**	9.7	**Prescription:**	EA	**Harvest System:**	Shovel
VCU Number:	5880	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		217

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are not defined by a single dominant overstory species, but rather by a mixture of many species. This stand predominantly contains western hemlock, redcedar, and yellow-cedar in varying degrees and densities. Spruce, mountain hemlock, and shorepine are also found but at low densities and infrequently. The stand structure is complex and the canopy is fairly broken throughout and due mainly to poor soil drainage but also tree mortality. Overstory trees vary in size but are smaller in diameter than other forest types, and moderately-to-poorly stocked. Snags and downed wood are common throughout. The understory is heavy throughout because of breaks in the canopy and contains a variety of well-distributed shrubs and forbs. This stand is mature with moderate stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections in the overstory are heavy. The risk for windthrow in this stand is moderate due to its exposure to winds coming off adjacent past harvest, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. Because the potential opening of the planned harvest unit was greater than 20 acres in size, legacy is designated for retention to meet this requirement (Forest Plan, page 4-68). RAW buffers along a Class III stream to the north of this unit were initially indicated but were determined to be unnecessary after field review by qualified specialists.

TIMBER/LOGGING

This unit is planned for shovel yarding to landings located along a proposed temporary road off of NFSR 2050390.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2050390 (BMP 14.20, Road-4, Road-7). New temporary road construction, 0.23 miles (BMPs 14.5, Road-3, Road-5, Road-6, Road-7).

BOTANY

No restrictions for botany.

INVASIVE SPECIES

Weeds are in the area of the unit along NFSR 2050300. Follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest, but specifically in 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, to reduce the risk of further introduction, inspect all borrow pits before use and transport of rock to the units or new roads. See Krosse 2017 for all BMP's.

FISHERIES

Stream Num.: 119_4.0
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No Buffer
Concerns: N/A

Stream Num.: 119_4.0.1R
Stream Class: IV

Unit 939

Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No Buffer
Concerns: N/A

Stream Num.: 119_4.0.2R
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No Buffer
Concerns: N/A

Stream Num.: 119_4.1R
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No Buffer
Concerns: N/A

Stream Num.: 119_4.1R.1L
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No Buffer
Concerns: N/A

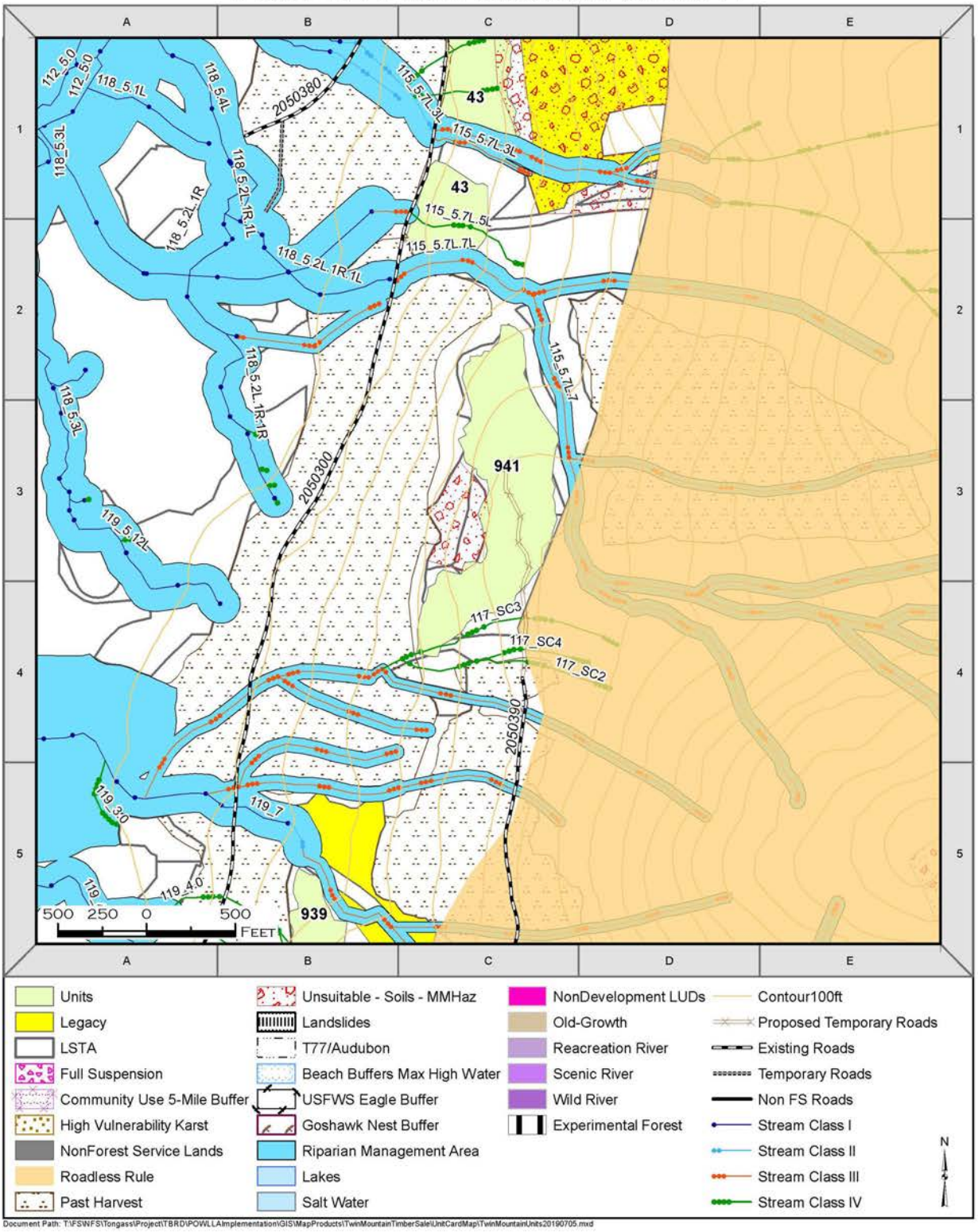
Stream Num.: 119_5
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No Buffer
Concerns: N/A

Stream Num.: 119_5.1L
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No Buffer
Concerns: N/A

Stream Num.: 119_5.2L
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No Buffer
Concerns: N/A

Unit 939
Stream Num.: 119_7 Stream Class: II, III Channel Type: HCL Protection: Category A and B Flagging: B/W, O/W Buffer (RMA): Class II for HCL: 100 feet or to the top of the side-slope break; whichever is greater Class III for HCL: To the top of the side-slope break Concerns: Moderate Blowdown
All Streams Protection/Mitigation Actions by Category: All Categories implement BMPs Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers. Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
This unit is accessed by the reconstructed NFS 2050390 road which has no culvert work specified. There is a new temporary road and there are two culvert specified for one Class IV and one non-stream crossing. Crossing structures will need to be installed for at least three additional Class IV streams. Should temporary road locations be changed such that different streams would be crossed, structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3, 14.5 and AqEco-4.
GEOLOGY/KARST
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes range from 35 to 65%. A small 50ft rock outcrop is located in the middle of the unit. All slopes are suitable for harvest with shovel yarding and should follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMPs 12.5 and 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). The proposed temporary road does not cross any wetland. Follow R10 BMPs12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
Goshawk surveys were completed in 2017; there were no goshawks detected.

POW LLA Twin Mountain Unit 941



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Unit 941							
Unit Number:	941	**Total Harvest Unit Acres**	16.2	**Prescription:**	EA	**Harvest System:**	Shovel
VCU Number:	5880	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		362

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock with a strong component of yellow-cedar in the overstory, but also contains lesser amounts of spruce and redcedar. Stand structure is complex with breaks throughout the canopy from overstory mortality and variable soil drainage. Tree sizes cover a wide range and stocking ranges from moderate-to-well stocked. Yellow-cedar snags are common throughout, with lesser amounts of snags of different species. The understory layer is brushy, mainly blueberry but has a strong component of rusty menziesia, and is more evenly distributed throughout because of breaks in the canopy. Forbs commonly found in old-growth are distributed throughout. This stand is mature with moderate stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections in the overstory are moderate. The risk for windthrow in this stand is moderate due to its exposure to winds coming off adjacent past harvest, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. Because the potential opening of the planned harvest units (both Unit 43 and 941 combined) was greater than 20 acres in size, legacy is designated for retention to meet this requirement (Forest Plan, page 4-68). No concerns were identified in this unit that would require a review for a RAW buffer.

TIMBER/LOGGING

This unit is planned for shovel yarding to landing located along a proposed temporary road off of NFSR 2050390.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2050390 (BMP 14.20, Road-4, Road-7). New temporary road construction, 0.25 miles (BMPs 14.5, Road-3, Road-5, Road-6, Road-7).

BOTANY

No botany concerns.

INVASIVE SPECIES

Weeds are in the area of the unit along NFSR 2050300. Follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest, but specifically in 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, to reduce the risk of further introduction, inspect all borrow pits before use and transport of rock to the units or new roads. See Krosse 2017 for all BMP's.

FISHERIES

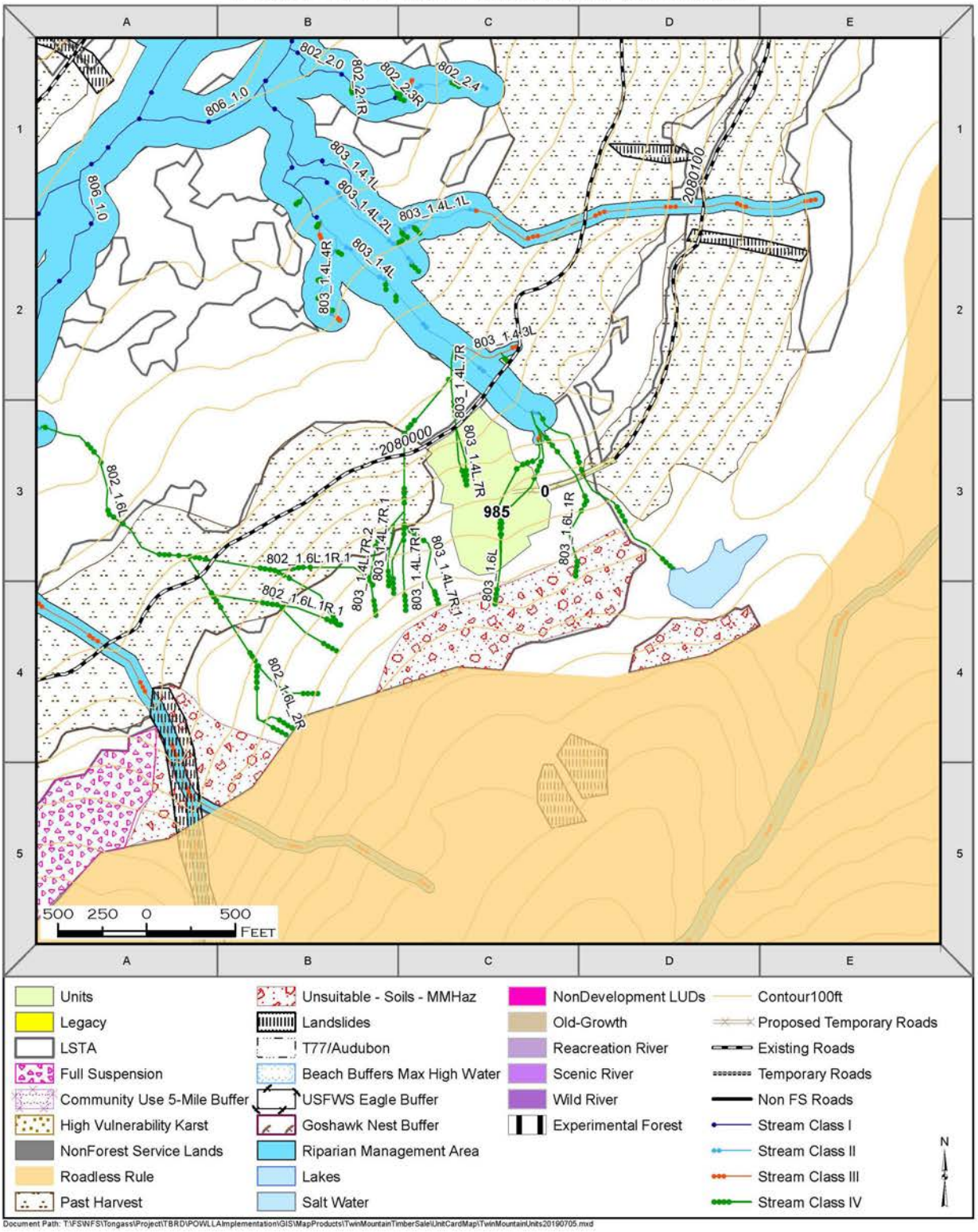
Stream Num.: 115_5.7L.7L
Stream Class: III
Channel Type: HCV, HCD
Protection: Category B
Flagging: O/W
Buffer (RMA):
Class III for HCV: To the top of the side-slope break
Class III for HCD: To the top of the side-slope break
Concerns: N/A

Stream Num.: 117_SC2
Stream Class: IV

Unit 941
Channel Type: HCO Protection: Category C Flagging: G/W Buffer (RMA): Class IV for HCO: No buffer Stream Num.: 117_SC3 Stream Class: IV Channel Type: HCO Protection: Category C Flagging: G/W Buffer (RMA): Class IV for HCO: No buffer Concerns: N/A Stream Num.: 117_SC4 Stream Class: IV Channel Type: HCO Protection: Category C Flagging: G/W Buffer (RMA): Class IV for HCO: No buffer Concerns: N/A Stream Num.: Map Location D-3 Stream Class: III Channel Type: HCM Protection: Category B Flagging: O/W Buffer (RMA): Class III for HCM: To the top of the side-slope break Concerns: N/A Stream Num.: Map Location C-4 Stream Class: III Channel Type: HCM Protection: Category B Flagging: O/W Buffer (RMA): Class III for HCM: To the top of the side-slope break Concerns: N/A
All Streams Protection/Mitigation Actions by Category: All Categories implement BMPs Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers. Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
This unit is accessed by the reconstructed NFS 2050390 road which has no culvert work specified. One Class IV and one non-stream crossing have been specified and located for new temporary road. Should temporary road locations be changed such that different streams would be crossed, structures and locations will be approved by

Unit 941
USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3, 14.5 and AqEco-4.
GEOLOGY/KARST
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes range from gentle to greater than 72%. Approximately 3 acres were excluded from harvest consideration due to very wet steep slopes. The remainder of the slopes are suitable for shovel yarding and should follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMPs 12.5 and 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). Forested wetland is present throughout the unit and is dominant (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4). The temporary road traverses about a ½ acre of forested wetland. Wetland avoidance was not feasible due to the location of the existing road, engineering constrains with steep ground, and wetland abundance. Follow R10 BMPs12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected.

POW LLA Twin Mountain Unit 985



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Unit 985							
Unit Number:	985	**Total Harvest Unit Acres**	9.1 1 in ROW	**Prescription:**	EA	**Harvest System:**	Cable
VCU Number:	5330	**LUD:**	Timber Production		**Net Harvest Volume (MBF):**		203 11 in ROW

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock in the overstory with lesser amounts of spruce and cedar irregularly distributed throughout. Stand structure is variable, containing breaks in the canopy from tree mortality and windthrow where a variety of trees sizes are found, but also has areas of continuous canopy cover where overstory trees are well-stocked. Trees range in size from small seedlings to large diameter dominant overstory individuals. This stand is mature with moderate stem decay and defect resulting in a situation where stand growth is being offset by decay. Snags and downed wooded are distributed throughout. The understory is predominantly blueberry with lesser amounts of devil's club and skunk cabbage. Forbs commonly found in old-growth are distributed throughout but in varied densities. This stand has varying levels of disease and decay throughout, ranging from light to heavy. Mistletoe infections are not prominent in this stand. The risk for windthrow in this stand is high due to its western exposure, past history of heavy windthrow events, and existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guidelines or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. An evaluation for a RAW buffer was conducted along a Class III stream and alluvial fan to the northeast of the unit but it was determined to be unnecessary after field review by a team of specialists.

TIMBER/LOGGING

This unit is planned for uphill and downhill cable yarding to landings located along a temporary road off of NFS road 2080000. Additional acreage and volume described above for temporary road right-of-way outside unit boundary

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2080000 (BMP 14.20, Road-4, Road-7) and temporary road on existing prism, 0.12 miles (BMPs 14.5, Road-3, Road-5, Road-6). New temporary road construction, 0.12 miles (BMPs 14.5, Road-3, Road-5, Road-6, Road-7).

BOTANY

No botany concerns.

INVASIVE SPECIES

No weeds are known from this area. However, to keep this area weed-free follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest. Specifically follow recommendations under Activity Cards 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, inspect all borrow pits before use and transport of rock to the units or new roads.

FISHERIES

Stream Num.: 803_1.4L
Stream Class: II
Channel Type: HCM
Protection: Category A
Flagging: B/W
Buffer (RMA)
Class II for HCM: 100 feet or to the top of the side-slope break; whichever is greater
Concerns: Moderate blowdown in the stream

Stream Num.: 803_1.4L.7R

Unit 985

Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA)
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 803_1.4L.7R.1R
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA)
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 803_1.4L.7R.1R.1R
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA)
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 803_1.6L
Stream Class: III, IV
Channel Type: HCM, HCL
Protection: Category B and C
Flagging: O/W, G/W
Buffer (RMA)
Class III for HCM: To the top of the side-slope break
Class IV for HCL: No buffer
Concerns: N/A

Stream Num.: 803_1.6L.1R
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA)
Class IV for HCO: No buffer
Concerns: N/A

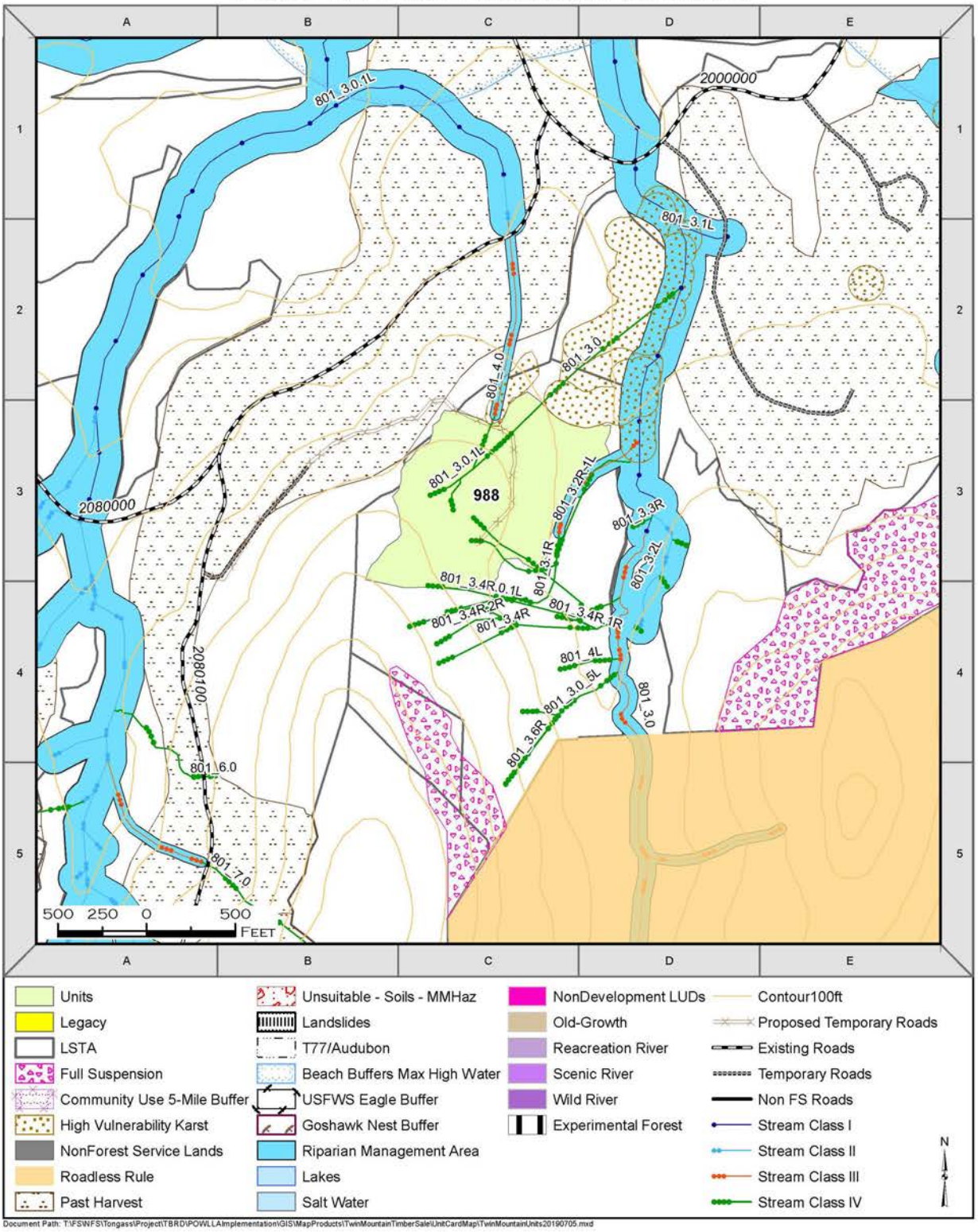
During the GIS process some streams were not removed from the corporate layer and were not included in the unit card text.

All Streams Protection/Mitigation Actions by Category:
All Categories implement BMPs
Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers.

Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers.

Unit 985
Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
This unit is accessed by the reconstructed NFS 2080000 road which has one specified replacement of a culvert for a Class III stream. There is likely to be more culvert work for 3 buried or damaged culverts, one of which is Class II downstream, and will require Title 16 concurrence, and timing requirements for construction. There are three temporary road crossings for Class IV streams and a Class IV alluvial cone feature. The crossings on the alluvial cone will be removed immediately following operations to avoid culvert failure. Should temporary road locations be changed such that different streams would be crossed, structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3, 14.5 and AqEco-4.
GEOLOGY/KARST
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
No scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes range from 35 to greater than 72%. Approximately 21 acres were excluded from harvest consideration due to very steep cliffs, steep wet slopes, and landslide activity. Small 50ft rock outcrops with slopes greater than 72% are present within the unit boundary. All slopes within the unit boundary are suitable for a minimum of partial suspension cable yarding (R10 BMPS 12.5, 13.5, and 13.9 and National Core BMPs Plan-2, AqEco-2, AqEco-4, Veg-1, Veg-2, Veg-5, and Veg-6). Forested wetland is present on the gentle slopes (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4). The temporary road traverses about a ¼ acre of forested wetland within the unit and about ¼ acre outside of the unit. Wetland avoidance was not feasible due to the location of the existing road, engineering constrains with steep ground, and wetland abundance next to the existing road. Follow R10 BMPs12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected. A pair of Sharp-shinned hawks were detected in unit on three separate occasions, once in June 2019 and on twice in July 2019 by three different crews. The June 2019 detection as well as the first July 2019 detection included both an audio and visual detection. The second July 2019 detection included the sharp-shinned hawks alarm calling and displaying defensive behavior; this detection may have included a third bird as well. The multiple detections over the timeframe and the behavior displayed indicate that this is sharp-shinned hawk nesting habitat and requires a 600 foot buffer over the location of the activity. Implementation of this buffer will affect most of this unit. All resource-specific protections and mitigations will be applied before harvest activities are implemented.

POW LLA Twin Mountain Unit 988



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Unit 988							
Unit Number:	988	**Total Harvest Unit Acres**	21.1	**Prescription:**	EA	**Harvest System:**	Shovel
VCU Number:	5330	**LUD:**	Modified Landscape		**Net Harvest Volume (MBF):**		473

Summary of Concerns, Responses, BMPs, and Mitigations

SILVICULTURE

Old-growth stands of this type are dominated by western hemlock with a strong component of redcedar in the overstory, but also contain lesser amounts of spruce and yellow-cedar. Stand structure is complex with small infrequent breaks in the canopy from overstory mortality and variable soil drainage. Tree sizes cover a wide range and stocking ranges from moderate-to-well stocked. Snags are common throughout and fairly well-distributed. The understory layer is moderately brushy, mainly blueberry, but has a strong component of rusty menziesia, and is unevenly distributed. Forbs commonly found in old-growth are distributed throughout. This stand is mature with light stem decay and defect resulting in a situation where stand growth is being offset by decay. Mistletoe infections in the overstory are moderate. The risk for windthrow in this stand is high due to its exposure to winds coming off Red Bay and adjacent past harvest, and due to existing stand and site characteristics.

The desired condition for this stand is a highly productive, healthy, windfirm stand grown for timber management that retains residual trees as needed to meet standards and guides or other objectives. The resulting even-aged structure will be representative of existing stands that receive moderate to major wind disturbance over a somewhat short time period. Trees retained within cable yarding areas would be primarily left in islands or clumps rather than dispersed throughout the unit to facilitate cable operations. Objectives for regeneration will be to reforest the stand to a species composition similar to the previous stand.

Even-aged clearcutting is being prescribed for this unit to preclude or minimize the occurrence of potentially adverse impacts from hemlock dwarf mistletoe or other insect or disease infections, logging damage and windthrow, or to rehabilitate poorly stocked timberlands (Forest Plan, page 4-68). The prescription implements even-aged management in order to minimize the potential for windthrow in the residual stand while maximizing volume and the use of conventional yarding systems needed for maintaining the potential for an economic timber sale offering. RAW buffers along the Class I and II streams near this unit were initially indicated but were determined to be unnecessary after field review by qualified specialists.

TIMBER/LOGGING

This unit is planned for shovel yarding to landings located along a proposed temporary road off of NFS road 2080100.

ENGINEERING/SYSTEM ROADS

Access via existing NFS road 2080100 (BMP 14.20, Road-4, Road-7). New temporary road on existing prism 0.18 miles. (BMPs 14.5, Road-3, Road-6). New temporary road construction, 0.38 miles (BMPs 14.5, Road-3, Road-5, Road-6, Road-7).

BOTANY

No botany concerns.

INVASIVE SPECIES

Weeds are in the area of the unit along NFSR 2000000, 2080000, and 2080100. Follow the Invasive Plant Management, Weed BMP's (Krosse 2017) outlined in all Activity Cards that deal with road building, maintenance and timber harvest, but specifically in 13, 19, 23 and 24 in the POW LLA Final ROD Appendix 1 to reduce the risk of introduction and spread. Most importantly, to reduce the risk of further introduction, inspect all borrow pits before use and transport of rock to the units or new roads. See Krosse 2017 for all applicable BMP's.

FISHERIES

Stream Num.: 801_3.0
Stream Class: I
Channel Type: MCM, HCD
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class I for MCM: 100 feet or to the top of the side-slope break; whichever is greater
Class I for HCD: 100 feet or to the top of the side-slope break; whichever is greater
Concerns: Moderate blowdown. Karst

Stream Num.: 801_3.1R
Stream Class: III, IV
Channel Type: HCD, HCM, HCO

Unit 988

Protection: Category B and C
Flagging: O/W, G/W
Buffer (RMA):
Class III for HCD: To the top of the side-slope break
Class III for HCM: To the top of the side-slope break
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: Map Location C-3 (801_3.1R.1R)
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 801_3.4R.1R
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 801_3.4R.2R
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 801_4.0
Stream Class: III, IV
Channel Type: HCM, HCO
Protection: Category B and C
Flagging: O/W, G/W
Buffer (RMA):
Class III for HCM: To the top of the side-slope break
Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: Map Location C-3 (801_4.IL)
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for HCO: No buffer
Concerns: N/A

During the GIS process some streams were not removed from the corporate layer and were not included in the unit card text.

All Streams Protection/Mitigation Actions by Category:
All Categories implement BMPs
Category A reaches flagged B/W: Under the TTRA timber harvest shall not be within 100 feet of the stream channel and a Stream course Protection Plan will be developed for that buffer. Additional AHMU buffers and

Unit 988
selective harvest buffers may apply as specified above. Total no cut buffer is the sum of the no commercial and no programmed commercial harvest buffers. Category B reaches flagged O/W: Trees shall be felled in such a manner so that the direction of fall is away from the stream course. Trees or products shall not be hauled or yarded across the stream course unless fully suspended. Debris entering streams from harvest activities shall be removed. Additional AHMU buffers and selective harvest buffers may apply as specified above. Total no cut buffer equals the no programmed commercial harvest buffers. Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.
ROAD/STREAM CROSSING SUMMARY
This unit is accessed by the reconstructed NFS 2080000 road, which does not require culvert work until after the point where temporary road reconstruction begins. There are eight culverts specified for Class IV, non-stream and cross drains along the temporary road. Should temporary road locations be changed such that different streams would be crossed, structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3, 14.5 and AqEco-4.
GEOLOGY/KARST
Unit review and surveys have been completed. Some of the unit is underlain by karst. The karst is of moderate vulnerability. A harvest method that obtains partial suspension is required on the moderate vulnerability karst.
HERITAGE RESOURCES
A finding of “No historic properties affected” (36 CFR 800.4(d)(1) or “No adverse effect” (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project’s implementation phase. All activities in the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
A small part of unit was in a High SIO, Low VAC area, and in Scenic Viewshed LUD. This area was dropped as a result of scenery concerns. Current layout has no scenery concerns.
RECREATION
No recreation concerns.
SOILS/WETLANDS
Slopes range from gentle to 55%. All slopes in the unit are suitable for harvest with shovel yarding and should follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMPs 12.5 and 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). Forested wetland is present in a small area in the northern part of the unit (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4). The temporary road traverses about a ½ acre of forested wetland. Wetland avoidance was not feasible due to the location of the existing road, engineering constrains with streams, karst, and slopes, and location of forested wetland. Follow R10 BMPs12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
Goshawk surveys have been completed; there were no goshawks detected. Sharp-shinned hawk and marbled murrelets were both documented in this unit. Sharp-shinned hawk behavior included adult alarm response to the broadcast of the goshawk juvenile begging call. At the location of the sharp-shinned response a dead murrelet chick was recorded. Adult sharp-shinned hawks responded to the goshawk call a second time at a second location. At the second location the surveyor was dive bombed and screamed at by both adult birds. Surveyor relocated to location of where it appeared adult birds had emerged and broadcast goshawk food begging call again. Juvenile sharp-shinned hawks responded to this goshawk call with food begging from nearby tree. The presence of juveniles is a strong indication of an active nest. The dead murrelet chick indicates the presence of a murrelet nest. Nesting habitat for both species require a 600-foot buffer on nesting habitat. All resource-specific protections and mitigations will be applied before harvest activities are implemented.