

Prince of Wales Landscape Level Analysis Project

Twin Mountain Timber Sale

Draft 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. 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. 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 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.

Individual unit card maps display harvest method as a label next to the unit number on the unit card maps. Three labels denote what method the original planned unit is to be harvested by. The SS and LS indicates cable yarding (short span and long span, respectively) and SH indicates shovel yarding. Shovel or cable yarding areas will either be harvested under an even-aged regeneration system utilizing the clearcut method or by the uneven-aged regeneration system utilizing the single tree and/or group selection method.

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 Purchaser's 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	<i>Platanthera unalascensis</i>
Lesser round-leaved orchid	<i>Platanthera orbiculata</i>
Lesser yellow lady's slipper	<i>Cypripedium parviflorum</i>

Rare Plants

Adder's-mouth orchid	<i>Malaxis monophyllos</i>
Cleafleaf ragwort	<i>Senecio moresbiensis</i>
Common moonwort	<i>Botrychium lunaria</i>
Maidenhair spleenwort	<i>Asplenium trichomanes</i> ssp. <i>trichomanes</i>
Pacific ninebark	<i>Physocarpus capitatus</i>
Rattlesnake fern	<i>Botrychium virginianum</i>
Swaying bulrush	<i>Scirpus subterminalis</i>
Whiteflower rein orchid	<i>Piperia candida</i>

Invasive 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	<i>Cirsium vulgare</i>
Canada thistle	<i>Cirsium arvense</i>
Common St. Johnswort	<i>Hypericum perforatum</i>

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 June 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 text. Field data for new streams was collected after the stream layer was updated, so some new streams are described in the text but are not shown on the map. 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 expected 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.

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 shall follow 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 these activities regardless of whether they are conducted under Section 106 or Section 110 (§ 306101-306107 and 306109306114) 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 shall be carried out to the degree required to make decisions regarding the historic properties that may be affected by proposed POW LLA activities. Known Heritage resources identified within a unit's area of potential effect (APE) have been evaluated for the National Register of Historic Places (NRHP) or have not been evaluated but are 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 has been 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).

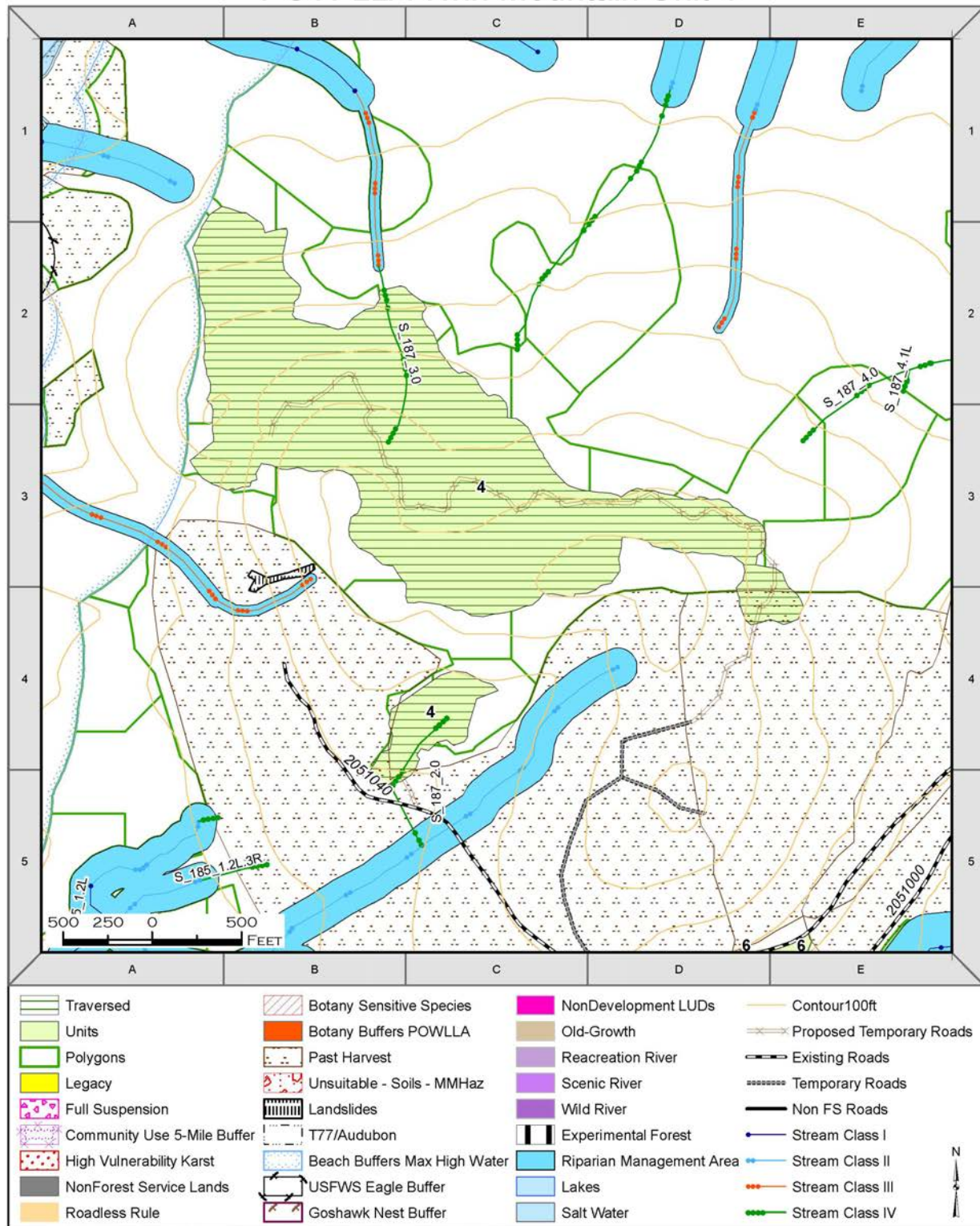
Marbled Murrelet: If nests are found during project implementation, maintain a 600-foot, generally circular, radius of undisturbed forest habitat surrounding identified murrelet nests, where available. Minimize disturbance activities within this buffer during the nesting season (May 1 to August 15). 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).

Subsistence

Old-growth stands within a 5-mile radius around communities will be limited to uneven-aged management, wildlife-centric prescriptions. Prescriptions will be designed to improve or maintain deer habitat and existing wildlife corridors.

POW LLA Twin Mountain Unit 4

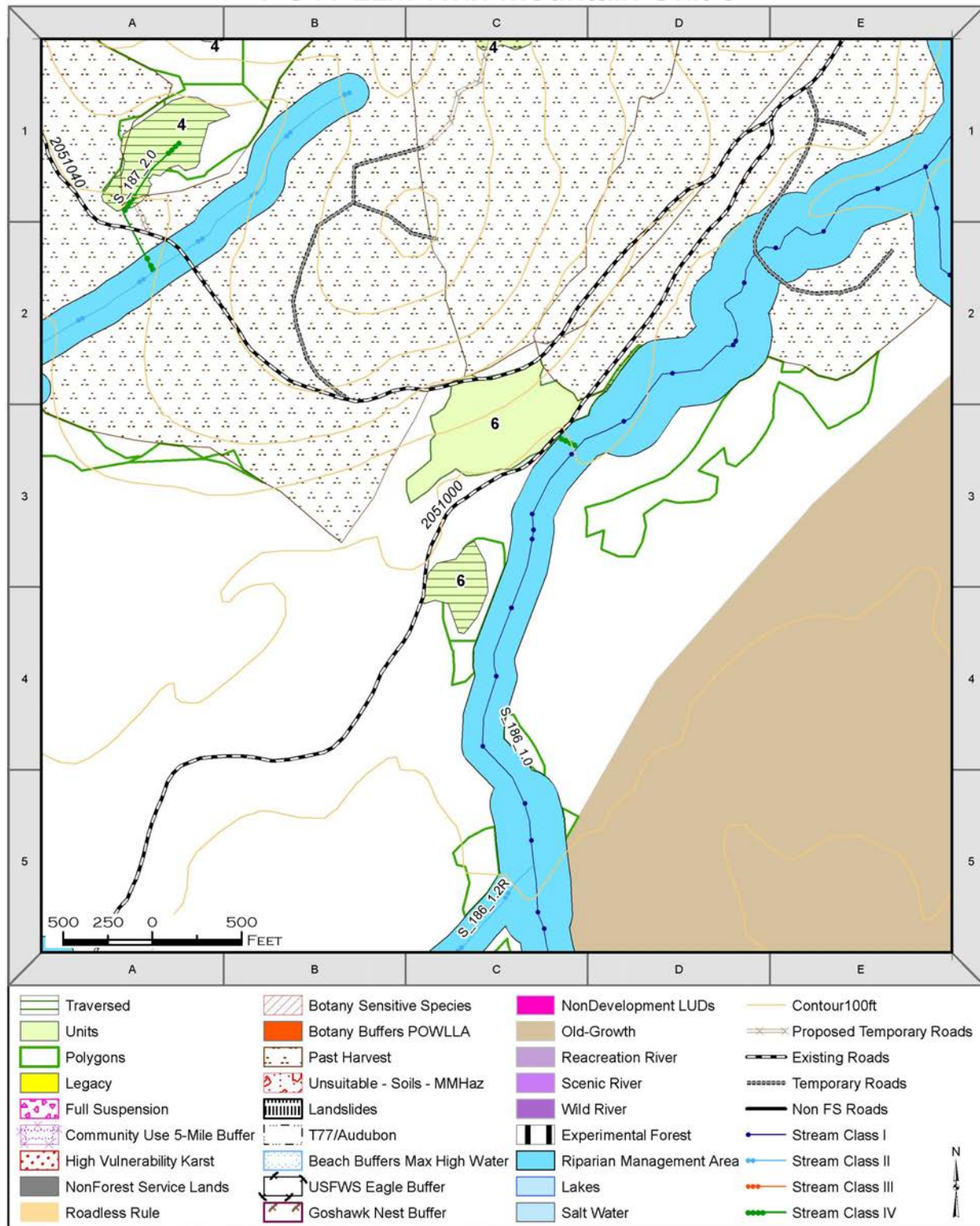


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Unit 4						
Unit Number:	4	Total Harvest Unit Acres	73.7	Prescription:	EA	Harvest System: Shovel
VCU Number:	5890	LUD:	Timber Production		Net Harvest Volume (MBF):	1,700
Summary of Concerns, Responses, BMPs, and Mitigations						
SILVICULTURE						
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.						
TIMBER/LOGGING						
This unit is planned for a combination of shovel and uphill cable yarding to landings along a proposed temporary road with a proposed temporary spur road 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 0.38 miles. (BMPs 14.5, Road-3, Road-6). New temporary road construction, 0.67 miles (BMPs 14.5, Road-3, Road-5, Road-6).						
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 Activities 13, 19, 23 and 24 in the POWLLA EIS 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_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.:	187_3.0					
Stream Class:	IV					
Channel Type:	HCO					
Protection:	Category C					
Flagging:	G/W					

Unit 4	
Buffer (RMA):	Class IV for HCO: No buffer
Concerns:	N/A
Stream Num.:	Map Location C-2 & C-3
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 stream crossings are anticipated. 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 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 a minimum of partial suspension. 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 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 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. No goshawks were detected.	

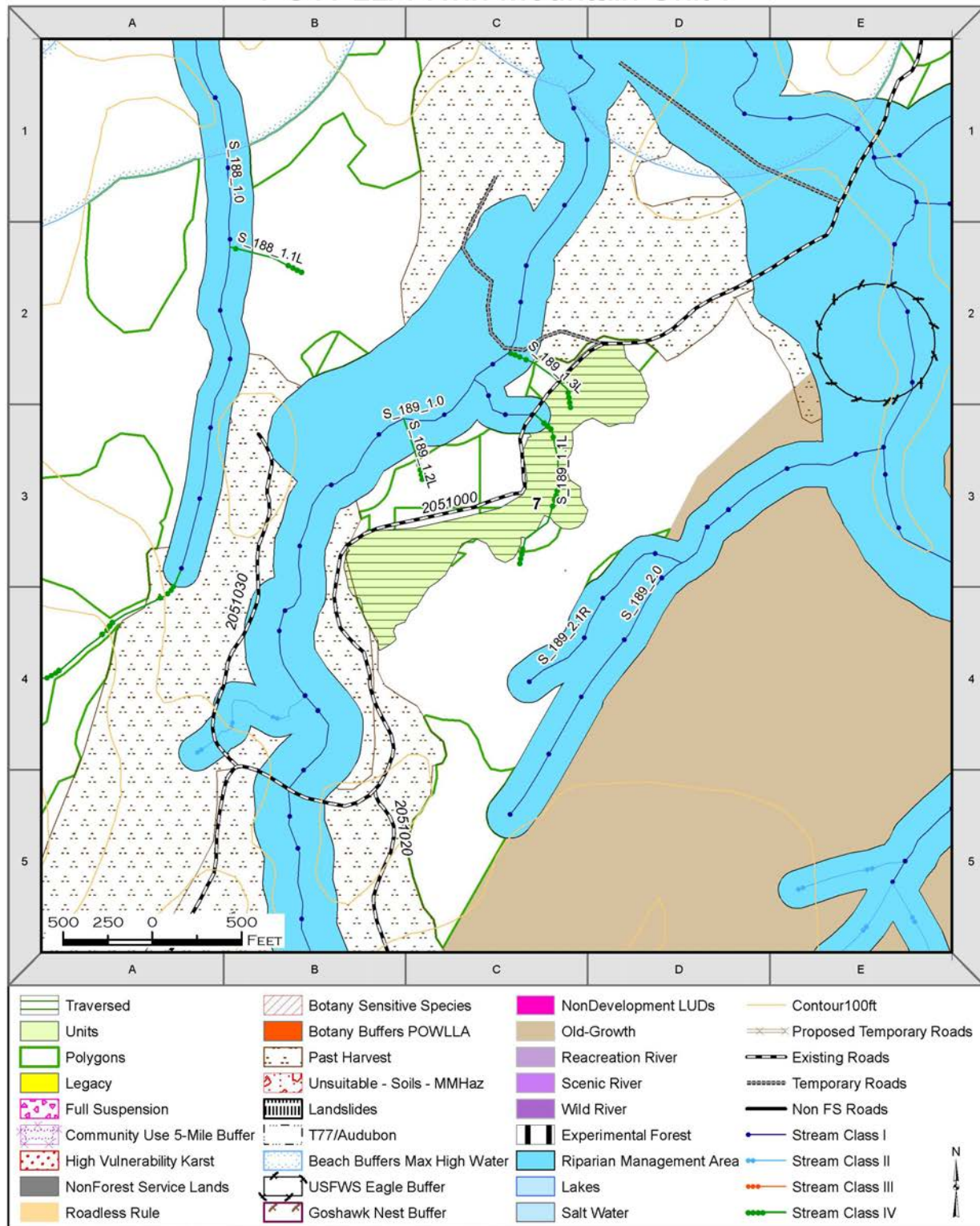
POW LLA Twin Mountain Unit 6



Unit 6							
Unit Number:	6	Total Harvest Unit Acres	2.5	Prescription:	EA	Harvest System:	Ground Based (Shovel)
VCU Number:	5890	LUD:	Timber Production		Net Harvest Volume (MBF):		76.4
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.							
TIMBER/LOGGING							
This unit is planned for shovel yarding to a landing on NFSR 2051000.							
ENGINEERING/SYSTEM ROADS							
Access via existing NFS roads 2051000 and 2051040 (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 POWLLA EIS 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:	FPM, MCM, PAB						
Protection:	A						
Flagging:	B/W						
Buffer (RMA):							
	Class I for FPM: 130 feet or to the extent of the riparian zone, whichever is greater						
	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 riparian zone, whichever is greater						
Concerns:	N/A						
Stream Num.:	186_1.1R						
Stream Class:	IV						
Channel Type:	MMO						
Protection:	C						
Flagging:	G/W						

Unit 6
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
No temporary roads are 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 as proposed as of 6/25/19.
RECREATION
No recreation concerns, as proposed, as of 09 July 2019.
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 a minimum of partial suspension. 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
Surveys have been completed. No goshawks detected.
All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 7

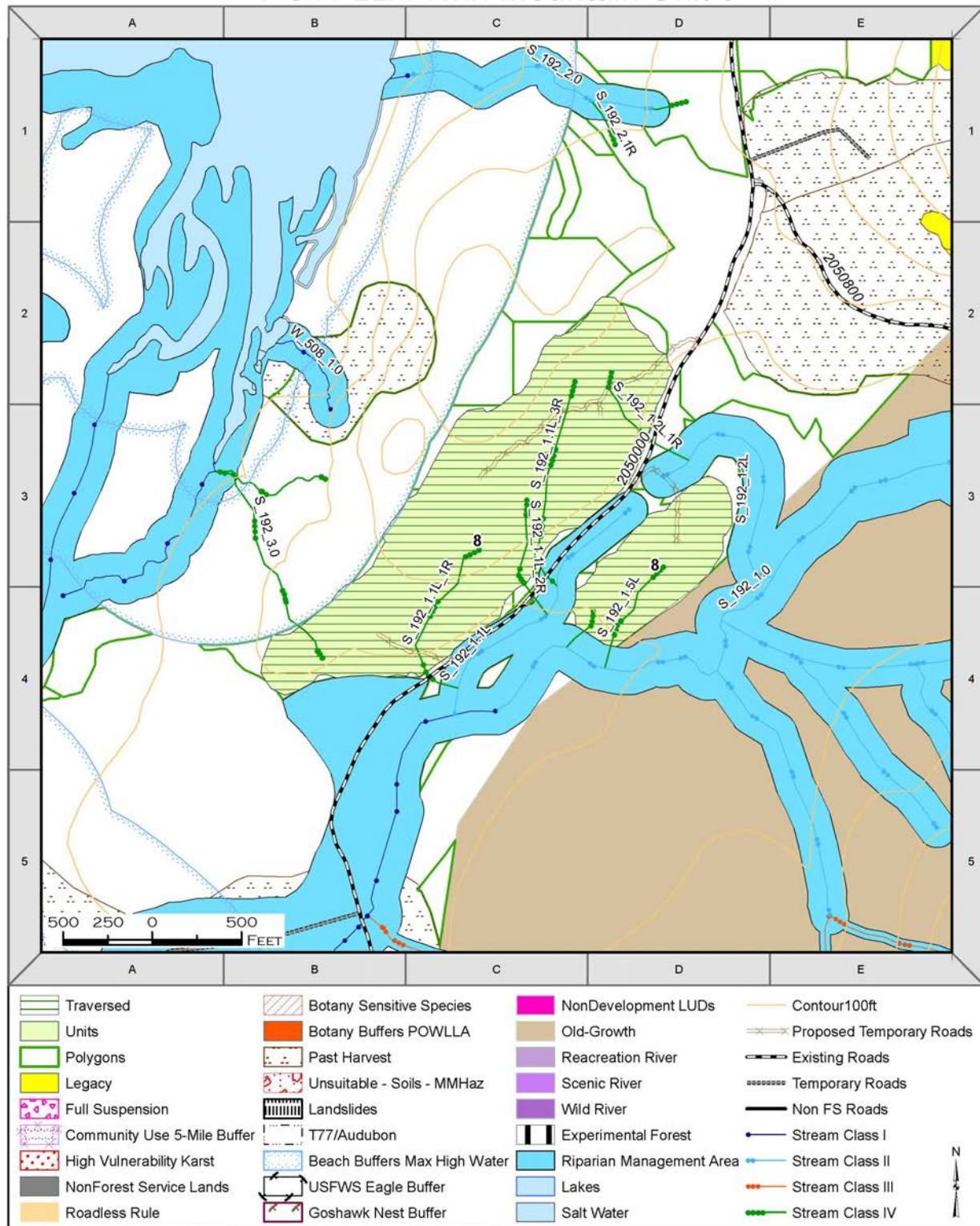


Unit 7						
Unit Number:	7	Total Harvest Unit Acres	16.6	Prescription:	EA	Harvest System: Shovel
VCU Number:	5890	LUD:	Timber Production	Net Harvest Volume (MBF):		552
Summary of Concerns, Responses, BMPs, and Mitigations						
SILVICULTURE						
Old-growth stands of this type are not defined by a single 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.						
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 POWLLA EIS 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:	FPO, HCO, PAO					

Unit 7	
Protection:	Category A, 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.	
Buffer (RMA):	
Class I for HCO: 100 feet or to the top of the side-slope break; whichever is greater.	
Buffer (RMA):	
Class IV for PAO: No buffer	
Concerns:	N/A
Stream Num.:	189_1.2L
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.:	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	
N/A	
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 as proposed as of 6/25/19.	
RECREATION	
No recreation concerns, as proposed, as of 09 July 2019.	
SOILS/WETLANDS	

Unit 7
Slopes are less than 25%. The soils are suitable for shovel yarding or a minimum of partial suspension. 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
May/June goshawk surveys have been completed. July/August goshawk surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

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, Cable
VCU Number:	5871, 5890	LUD:	Timber Production		Net Harvest Volume (MBF):		1,333
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. 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 and uphill cable 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). Temporary fish stream crossing requires approved crossing structure and concurrence with ADF&G. Temporary road to be closed and structures removed immediately after timber harvest is complete. 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.							
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 POWLLA EIS 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, MMM						
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. 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.						

Unit 8

Concerns: N/A

Stream Num.: 192_1.1L
 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.

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.: 192_1.3L
 Stream Class: IV
 Channel Type: PAO
 Protection: Category C
 Flagging: G/W
 Buffer (RMA):

Class IV for PAO: No buffer

Concerns: N/A

Stream Num.: 192_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

Stream Num.: 192_1.3
 Stream Class: IV
 Channel Type: MMO, HCO
 Protection: Category C
 Flagging: G/W
 Buffer (RMA):

Class IV for MMO, HCO: No buffer

Concerns: N/A

Stream Num.: 192_1.4
 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_1.5
 Stream Class: IV
 Channel Type: MMO
 Protection: Category C

Unit 8

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

Stream Num.: 8_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.: 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

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.

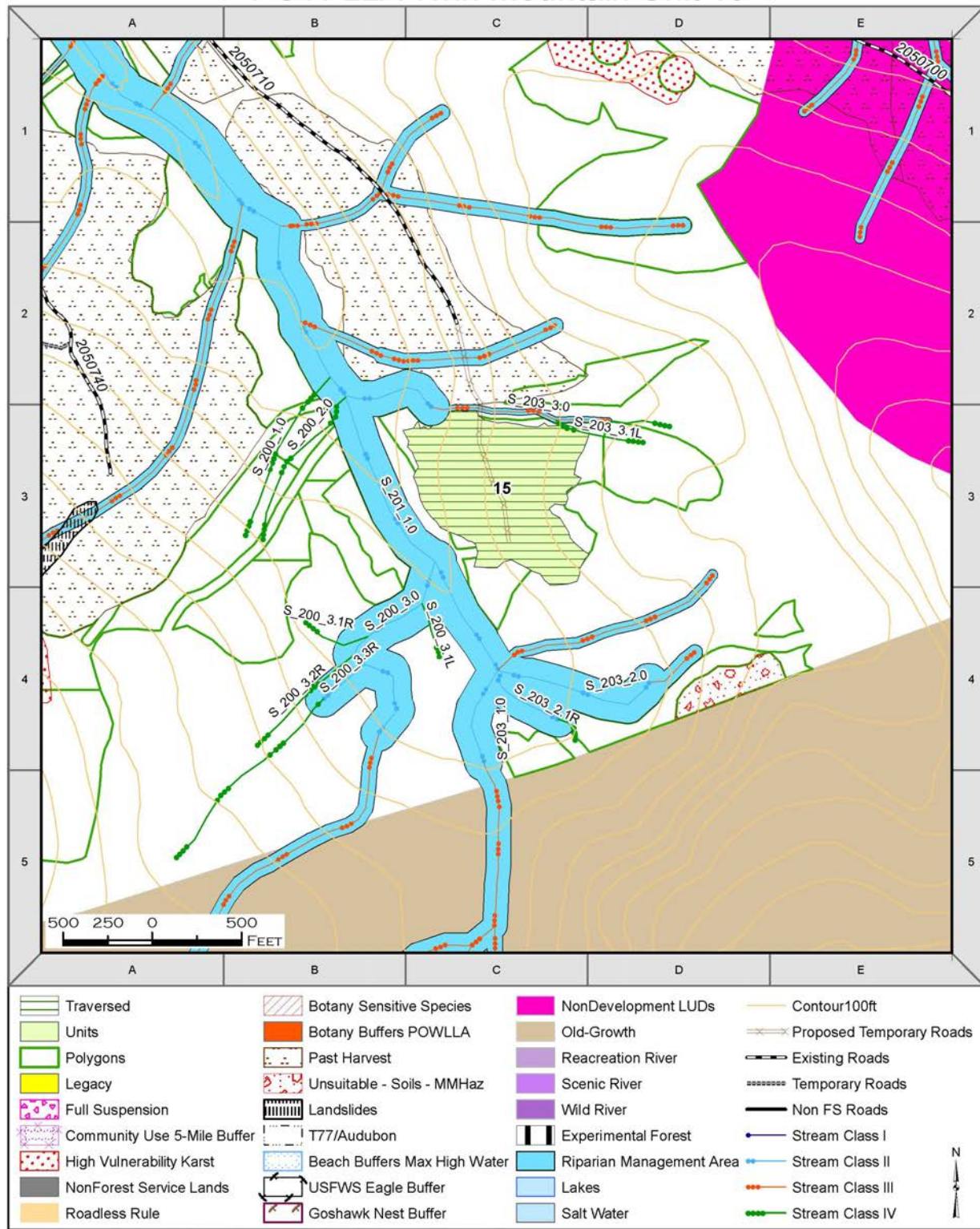
Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.

ROAD/STREAM CROSSING SUMMARY

Three segments of temporary road are proposed for this unit, three Class IV crossings on the west side of the 2050000 road and one Class II crossing on the east side of the 2050000 road. The segment to the east will require Title 16 concurrence with the state.

Unit 8
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 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 as proposed as of 6/25/19.
RECREATION
No recreation concerns, as proposed, as of 09 July 2019.
SOILS/WETLANDS
Slopes are less than 35% in both polygons. The soils are suitable for shovel yarding and partial suspension cable 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 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
Surveys have been completed. No goshawk detected. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 15



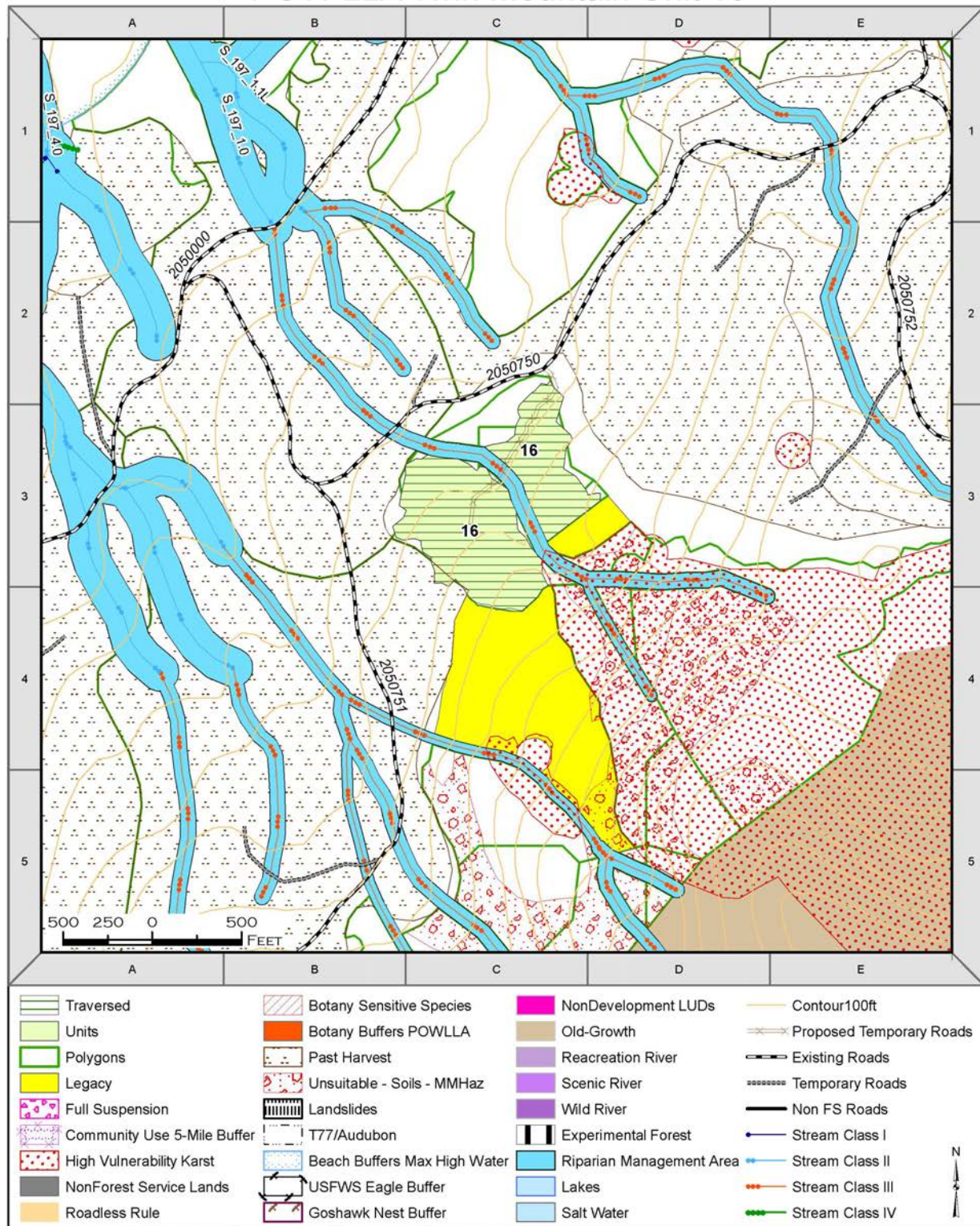
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Unit 15							
Unit Number:	15	Total Harvest Unit Acres	15.5	Prescription:	EA	Harvest System:	Shovel, Cable
VCU Number:	5871	LUD:	Timber Production		Net Harvest Volume (MBF):		353
Summary of Concerns, Responses, BMPs, and Mitigations							
SILVICULTURE							
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. However, the planned harvest unit is less than 20 acres in size which eliminates 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 shovel, 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, 0.25 miles (BMPs 14.5, Road-3, Road-5, Road-6).							
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 Activities 13, 19, 23 and 24 in the POWLLA EIS 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.: 203_3.0 Stream Class: II, III, IV Channel Type: HCO Protection: A, B, 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.: 201_1.0							

Unit 15	
Stream Class:	II
Channel Type:	HCD
Protection:	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.:	201_1.1L
Stream Class:	IV
Channel Type:	HCO
Protection:	C
Flagging:	G/W
Buffer (RMA):	
Class IV for HCO:	No buffer
Concerns:	N/A
Stream Num.:	201_3.1L
Stream Class:	IV
Channel Type:	HCO
Protection:	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 are two Class III stream crossings, first over an unverified, un-named stream, then over Stream Num. 203_3.0. 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 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 as proposed as of 6/25/19.	
RECREATION	
No recreation concerns, as proposed, as of 09 July 2019.	
SOILS/WETLANDS	

Unit 15
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
May/June goshawk surveys complete-no detections. July/August goshawk surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

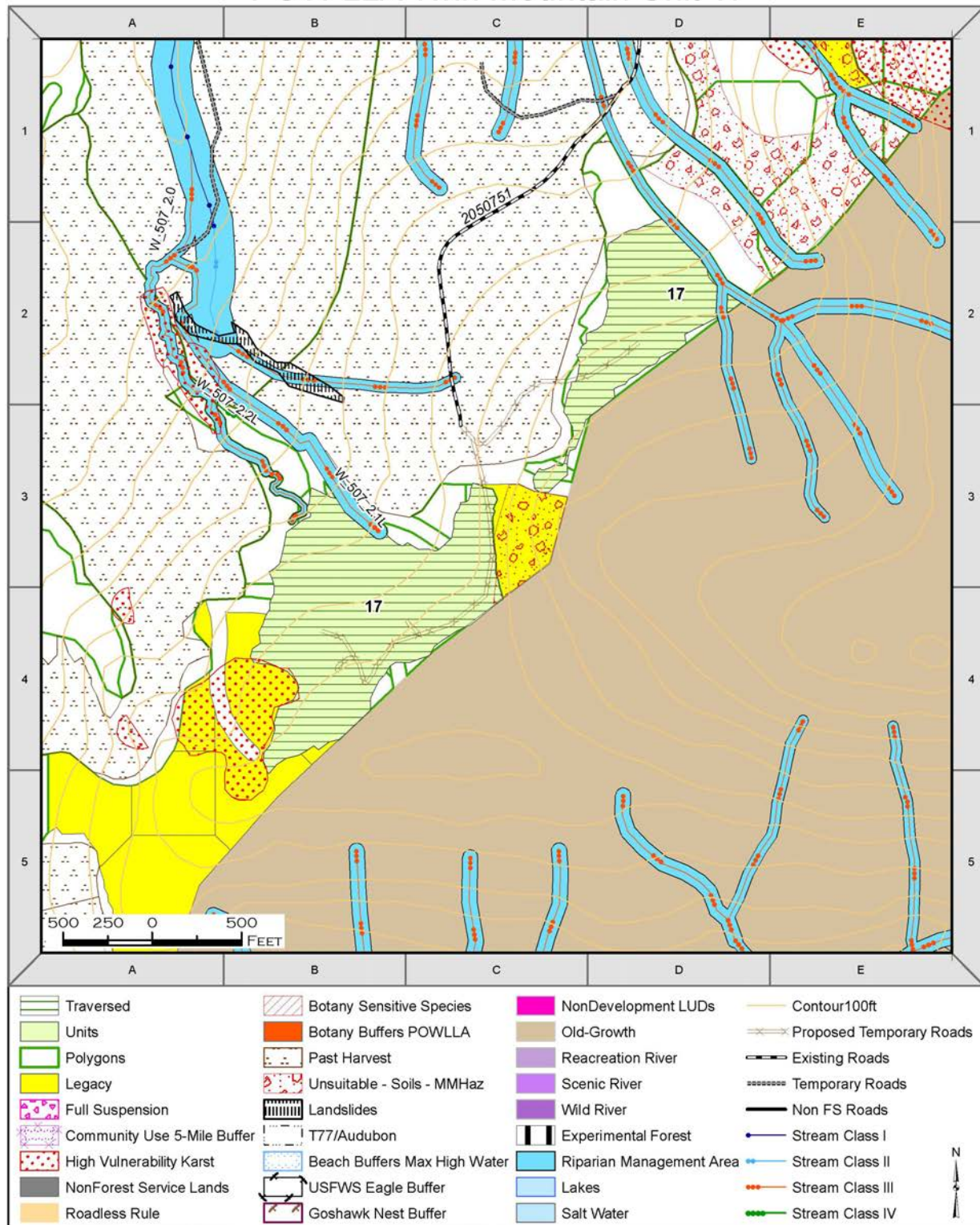
POW LLA Twin Mountain Unit 16



Unit 16							
Unit Number:	16	Total Harvest Unit Acres	17.1	Prescription:	EA	Harvest System:	Cable
VCU Number:	5871	LUD:	Timber Production		Net Harvest Volume (MBF):		413
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. However, the planned harvest unit is less than 20 acres in size which eliminates 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 downhill 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, 0.21 miles (BMPs 14.5, Road-3, Road-5, Road-6).							
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 Activities 13, 19, 23 and 24 in the POWLLA EIS 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:	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:	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 planned road crossing for Class III Stream Num. 16_1.0. 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 and 14.5.	
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 as proposed as of 6/25/19.	
RECREATION	
No recreation concerns, as proposed, as of 09 July 2019.	
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 minimum of partial suspension 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). 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 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 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.	
WILDLIFE	
Surveys completed. No goshawk detected. Marbled Murrelet activity in unit. Marbled murrelet activity requires 600 foot generally circular buffer in unit.	

POW LLA Twin Mountain Unit 17



Unit 17							
Unit Number:	17	Total Harvest Unit Acres	39.5	Prescription:	EA	Harvest System:	Shovel, Cable
VCU Number:	5871	LUD:	Timber Production		Net Harvest Volume (MBF):		906
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 planned harvest unit is greater than 20 acres in size, legacy retention will be implemented 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 a combination of shovel and uphill 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, 0.69 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 POWLLA EIS 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_1.0						
Stream Class:	III						
Channel Type:	HCM						
Protection:	B						
Flagging:	O/W						
Buffer (RMA):							
Class III for HCM:	To the top of the side-slope break						
Concerns:	N/A						
Stream Num.:	17_2.0						
Stream Class:	IV						

Unit 17	
Channel Type:	HCO
Protection:	C
Flagging:	G/W
Buffer (RMA):	
Class IV for HCO:	No buffer
Concerns:	N/A
Stream Num.:	17_3.0
Stream Class:	IV
Channel Type:	HCO
Protection:	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:	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:	HCO
Protection:	B
Flagging:	O/W
Buffer (RMA):	
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.	
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	
Surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.	
3-Temp road spurs that cross 3 Class 4 streams	
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	

Unit 17

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 as proposed as of 6/25/19.

RECREATION

No recreation concerns, as proposed, as of 09 July 2019.

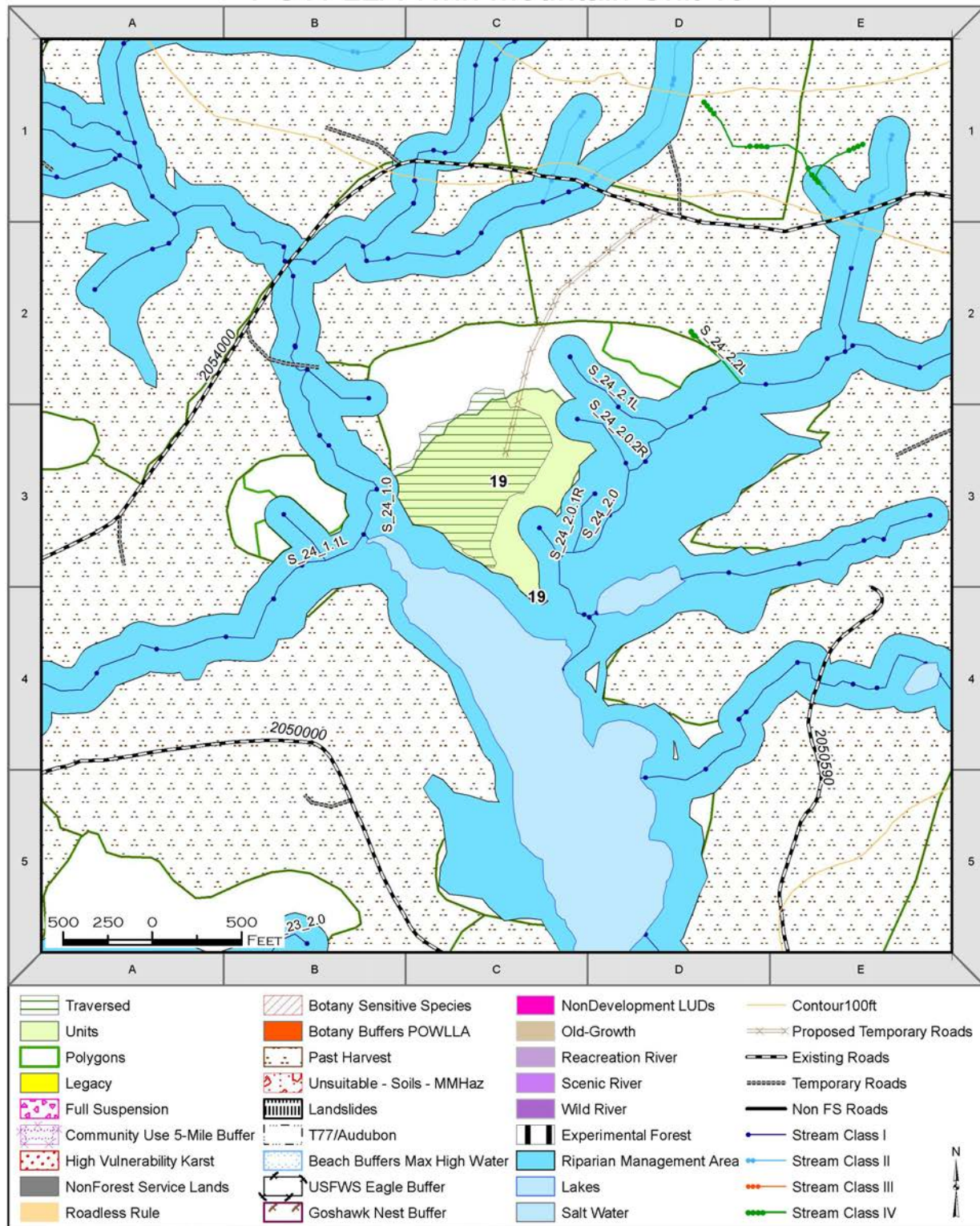
SOILS/WETLANDS

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

May/June goshawk surveys completed. July/August goshawk surveys have not been completed. Surveys will be completed prior to implementation. Unit is adjacent to OGR. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 19



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):		255
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.							
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, 0.35 miles (BMPs 14.5, Road-3, Road-5, Road-6). Temporary fish stream crossings require approved crossing structure and concurrence with ADF&G. Temporary road to be closed and structures removed immediately after timber harvest is complete. 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.							
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 Activities 13, 19, 23 and 24 in the POWLLA EIS 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.: 24_1 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							

Unit 19

Stream Num.: 24_1.0
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.: 24_1.0.1R
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_1.1L
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
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

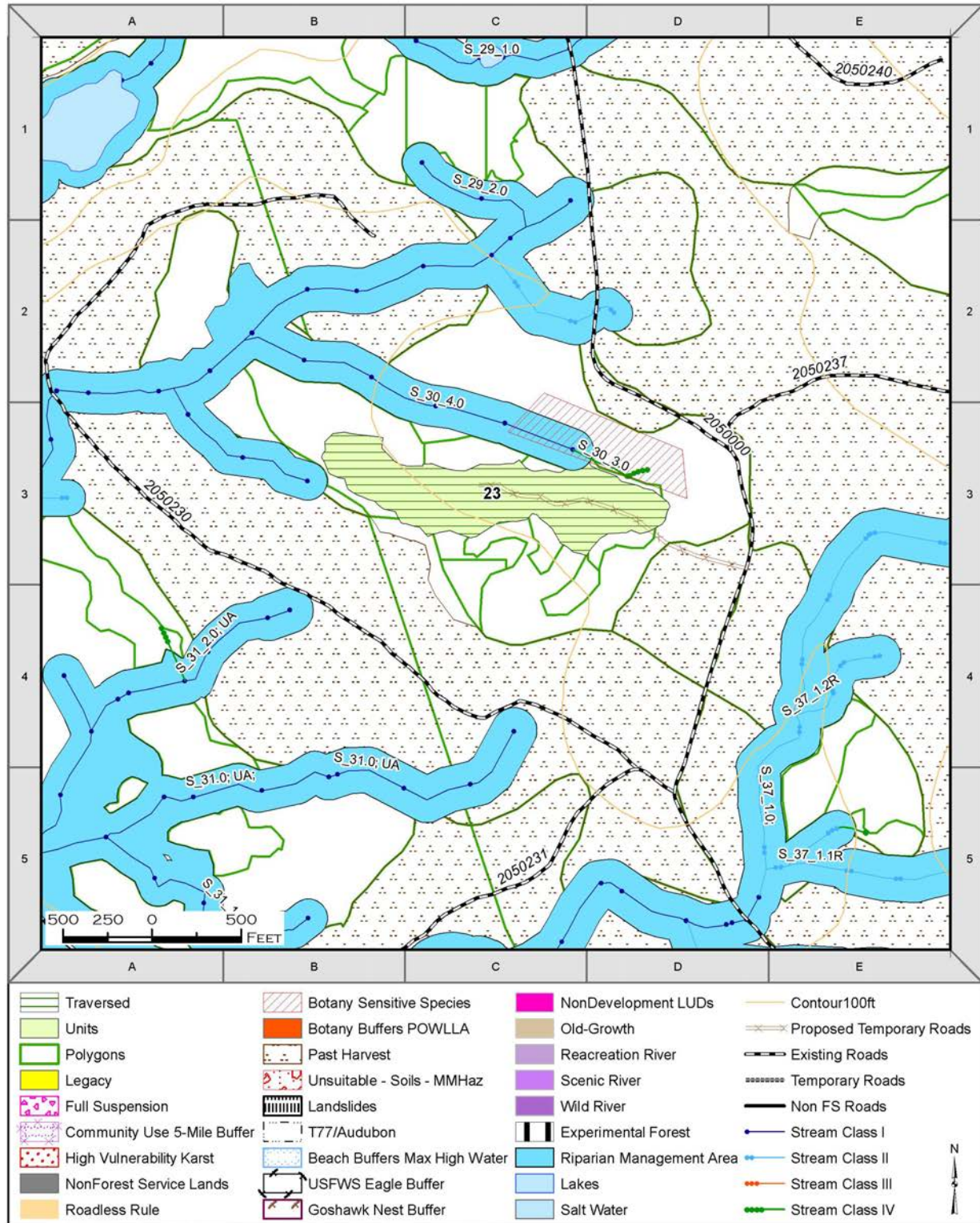
Stream Num.: 24_2.0.1R
Stream Class: I
Channel Type: PAB
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class I for PAB: 100 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater.
Concerns: N/A

Stream Num.: 24_2.0.2R
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

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
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 to access this unit has not been completely planned. Crossing location is anticipated to be over or near a Class I PAB stream and could require Title 16 concurrence. 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 as proposed as of 7/2/19.	
RECREATION	
No recreation concerns, as proposed, as of 09 July 2019.	
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	
Surveys completed. No goshawks detected. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.	

POW LLA Twin Mountain Unit 23

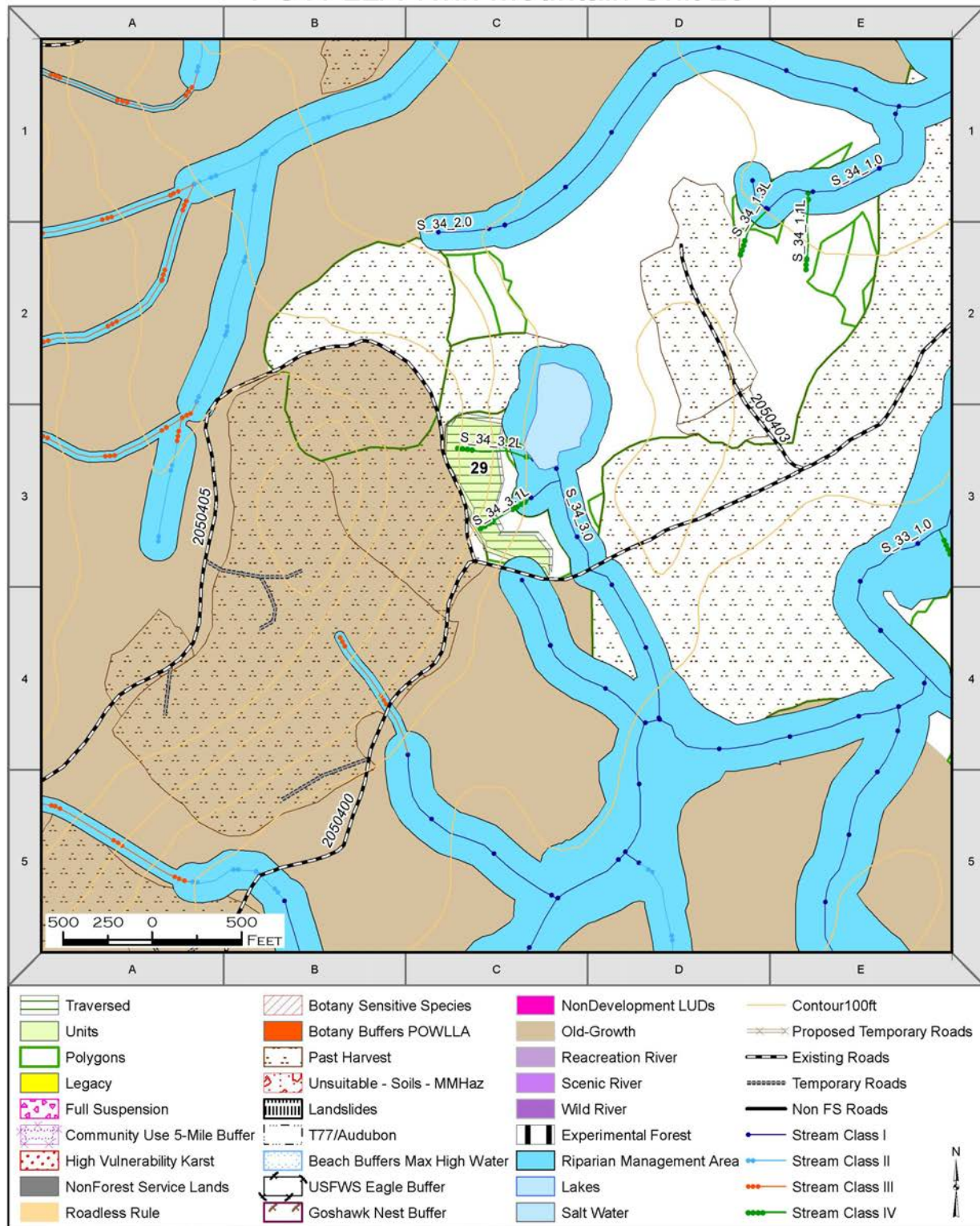


Unit 23						
Unit Number:	23	Total Harvest Unit Acres	14.7	Prescription:	EA	Harvest System: Shovel
VCU Number:	5880	LUD:	Timber Production	Net Harvest Volume (MBF):		323
Summary of Concerns, Responses, BMPs, and Mitigations						
SILVICULTURE						
Old-growth stands of this type are dominated by western 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. However, the planned harvest unit is less than 20 acres in size which eliminates 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 POWLLA EIS 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					
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					

Unit 23	
Stream Num.:	30_3.0
Stream Class:	II
Channel Type:	HCLw, PAO
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.	
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:	RAW, blowdown, karst
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 road stream crossings are anticipated. 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 as proposed as of 6/25/19.	
RECREATION	
No recreation concerns, as proposed, as of 09 July 2019.	
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	

Unit 23
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
May/June goshawk surveys completed: no detections. July/August goshawk surveys have not been completed. All required surveys will be completed prior to implementation. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 29



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):	108
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 planned harvest unit is less than 20 acres in size which eliminates this requirement (Forest Plan, page 4-68).						
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. 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 Activities 13, 19, 23 and 24 in the POWLLA EIS 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						
Lake Num.:	34_3.0					
Stream Class:	I					
Channel Type:	L					
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.:	34_3.0					
Stream Class:	I					
Channel Type:	MMO					

Unit 29

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: N/A

Stream Num.: 34_3.1L

Stream Class: I, II

Channel Type: MMO, MCO

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 MMO: 100 feet or to the top of the side-slope break; whichever is greater.

Class II for MCO: 100 feet or to the top of the side-slope break; whichever is greater.

Concerns: N/A

Stream Num.: 34_3.2L

Stream Class: II

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.: 34_3.3L

Stream Class: II

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

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

GEOLOGY/KARST

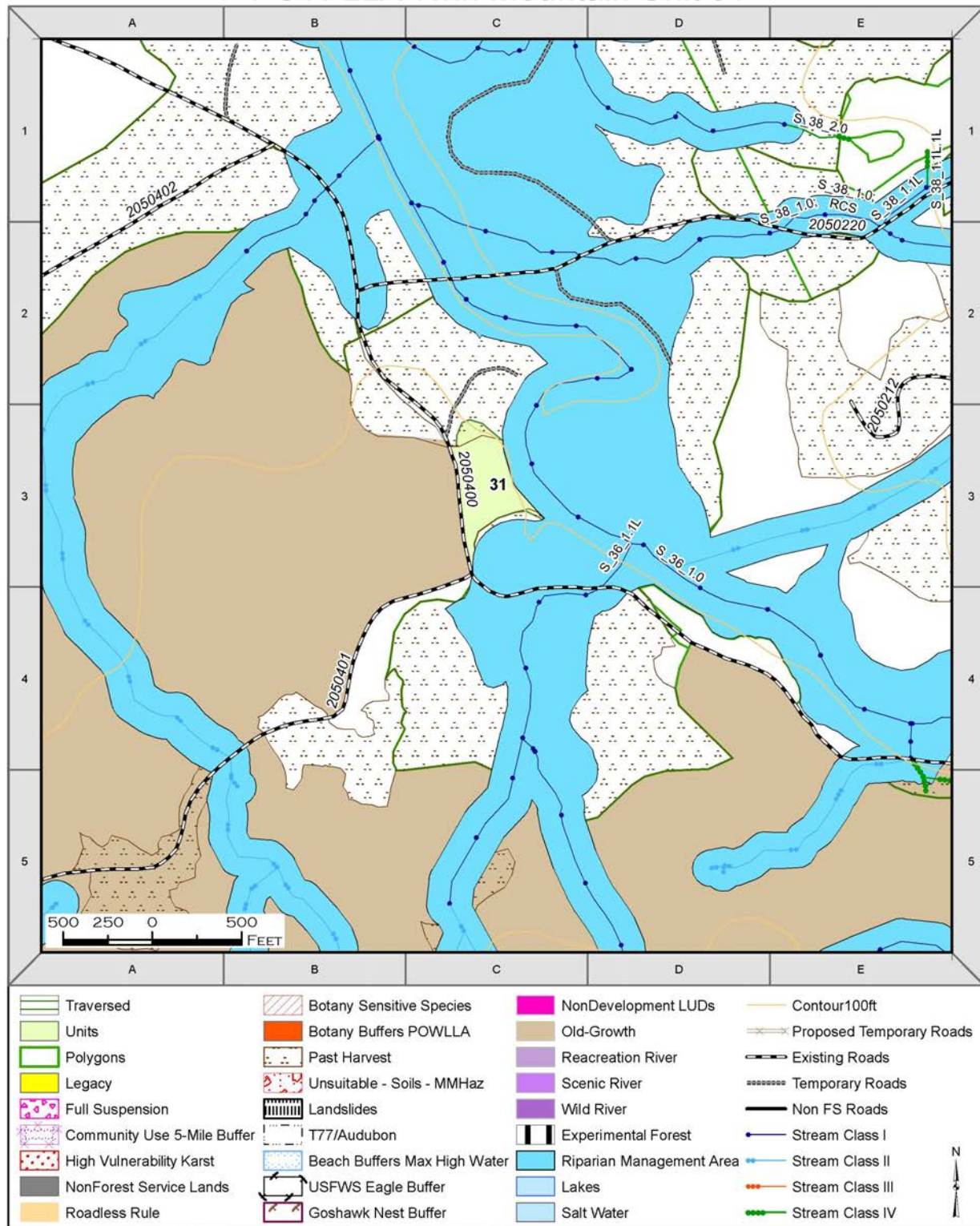
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.

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

Unit 29
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 as proposed as of 6/25/19.
RECREATION
No recreation concerns, as proposed, as of 09 July 2019.
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
May/June goshawk surveys complete-no detections. July/August goshawk surveys have not been completed. Goshawk surveys will be completed prior to implementation.
All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 31



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Unit 31						
Unit Number:	31	Total Harvest Unit Acres	4	Prescription:	EA	Harvest System: Shovel
VCU Number:	5880	LUD:	Modified Landscape, Timber Production	Net Harvest Volume (MBF):		66
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 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 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. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. However, the planned harvest unit is less than 20 acres in size which eliminates this requirement (Forest Plan, page 4-68).						
TIMBER/LOGGING						
This unit is planned for shovel yarding to landings located along NFSR 2050400.						
ENGINEERING/SYSTEM ROADS						
Access via existing NFS road 2050400 (BMP 14.20, Road-4, Road-6).						
BOTANY						
Unit has not been surveyed due to time constraints. Unit has low probability of having sensitive plants. Unless surveys are conducted to confirm, activities may impact sensitive or rare plant individuals.						
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 Activities 13, 19, 23 and 24 in the POWLLA EIS 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.: 36_1.0						
Stream Class: I						
Channel Type: LCM						
Protection: Category A						
Flagging: B/W						
Buffer (RMA):						
Class I for LCM: 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.						

Unit 31

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 are anticipated. 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 as proposed as of 7/2/19.

RECREATION

No recreation concerns, as proposed, as of 09 July 2019.

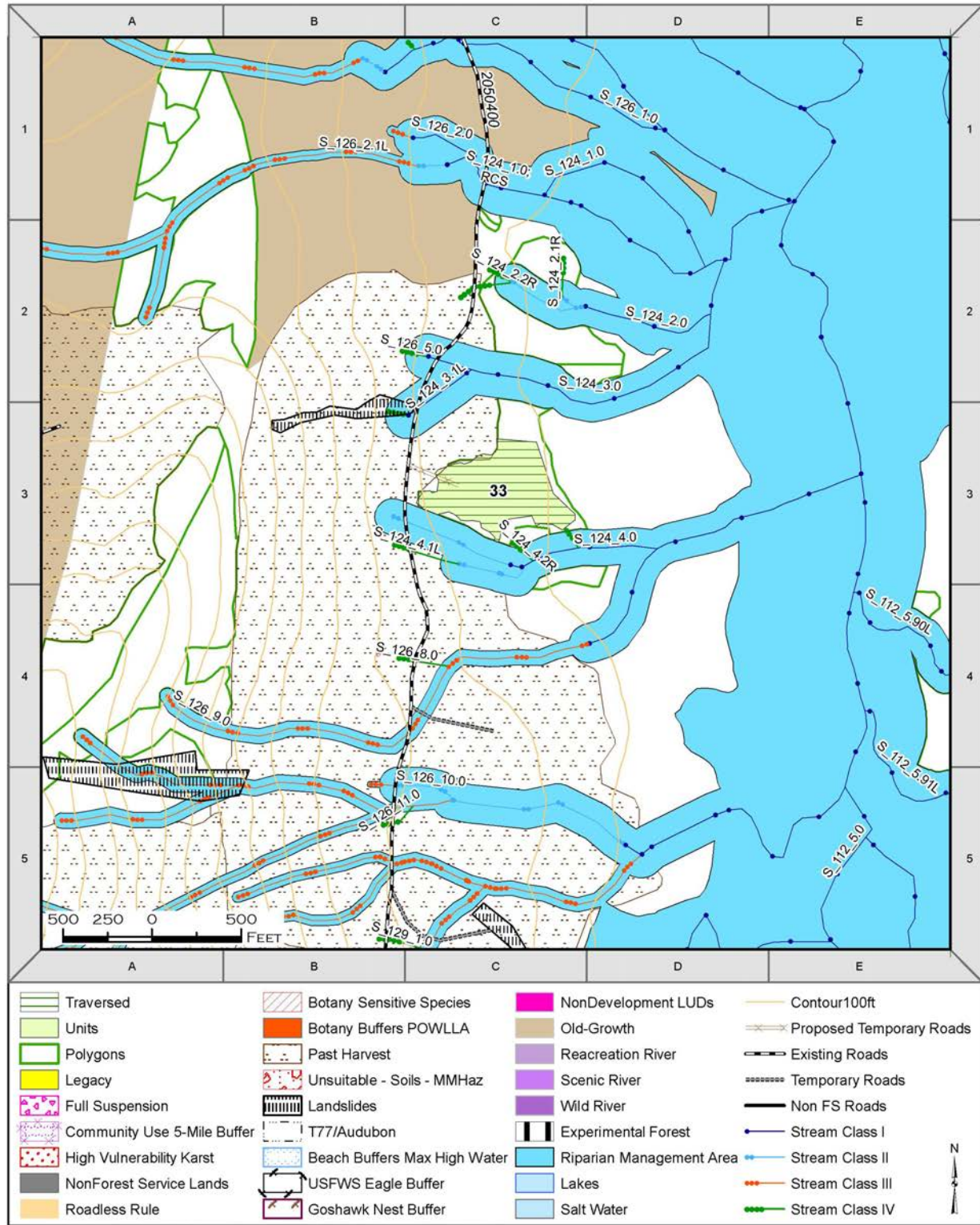
SOILS/WETLANDS

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). Forested wetlands are intermixed throughout the unit (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4).

WILDLIFE

May/June goshawk surveys have been completed: no detections. July/August goshawk surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 33



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):	179
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. However, the planned harvest unit is less than 20 acres in size which eliminates 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 NFSR 2050400.						
ENGINEERING/SYSTEM ROADS						
Access via existing NFS road 2050400 (BMP 14.20, Road-4, Road-6). New temporary road construction, 0.10 miles (BMPs 14.5, Road-3, Road-5, Road-6).						
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 Activities 13, 19, 23 and 24 in the POWLLA EIS 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, I, II					
Channel Type:	FPO, MMO, HCO					
Protection:	Category A, B					
Flagging:	B/W					
Buffer (RMA):						
	Class I for FPO: 130 feet or to the extent of the riparian zone, whichever is greater					
	Class I for MMO: 120 feet or to the extent of the riparian zone; 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_4.1R					

Unit 33

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.: 124_4.2R
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for MMO: No buffer
Concerns: N/A

Stream Num.: 124_4.1L
Stream Class: II, II, IV
Channel Type: MMO, HCO, HCL, HCO
Protection: Category A, C
Flagging: B/W, G/W
Buffer (RMA):
Class II for MMO: 120 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 HCL: 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

No temporary road/stream crossings are anticipated. 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

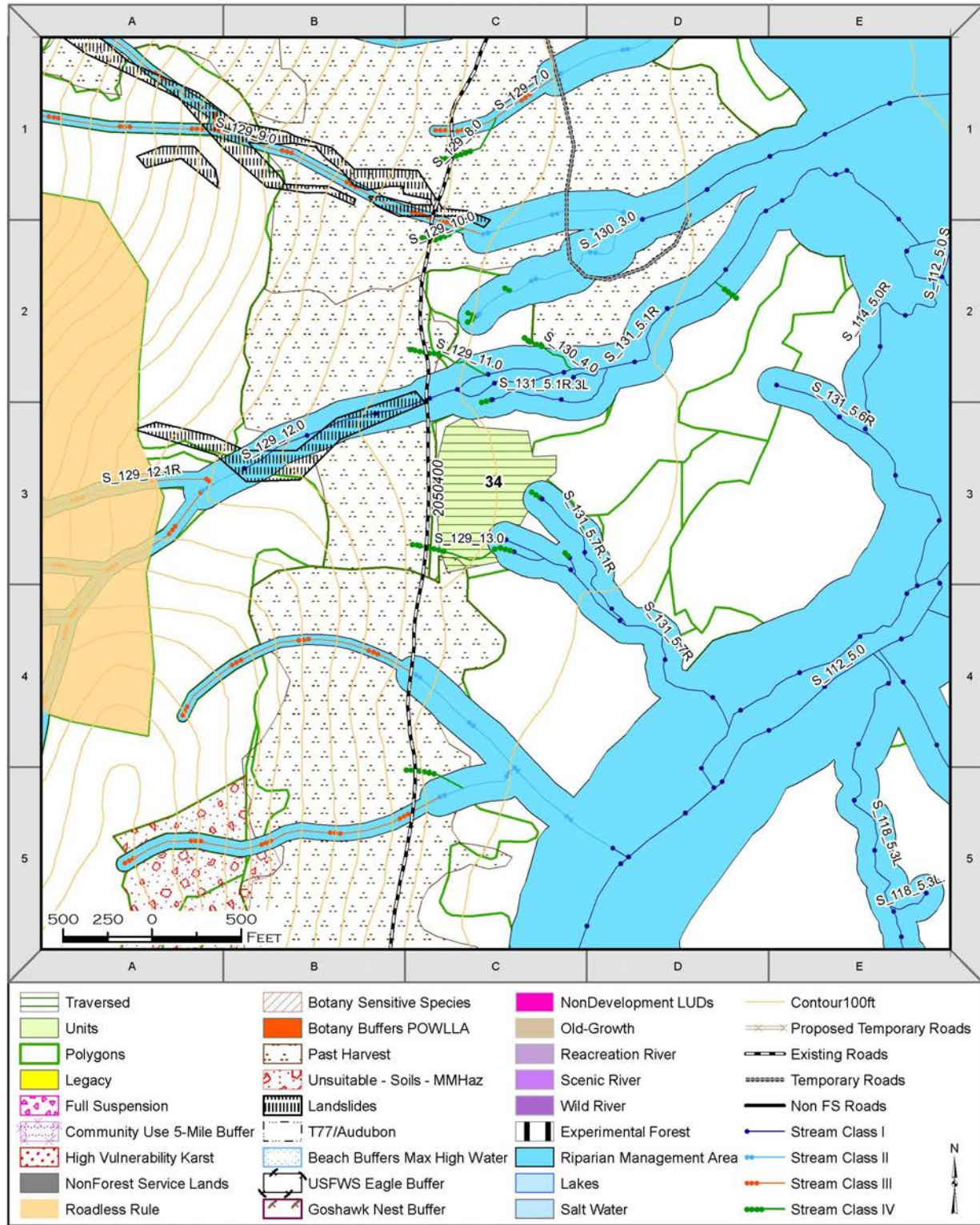
A finding of "No historic properties affected" (36 CFR 800.4(d)(1) or "No adverse effect" (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project's 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 as proposed as of 6/25/19.

Unit 33	
RECREATION	
No recreation concerns, as proposed, as of 09 July 2019.	
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 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.	
WILDLIFE	
May/June goshawk surveys have been completed: no detections. July/August goshawk surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.	

POW LLA Twin Mountain Unit 34



Unit 34						
Unit Number:	34	Total Harvest Unit Acres	9.3	Prescription:	EA	Harvest System: Shovel
VCU Number:	5880	LUD:	Timber Production	Net Harvest Volume (MBF):		211
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 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 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. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. However, the planned harvest unit is less than 20 acres in size which eliminates this requirement (Forest Plan, page 4-68).						
TIMBER/LOGGING						
This unit is planned for shovel yarding to landings located along NFSR 2050400.						
ENGINEERING/SYSTEM ROADS						
Access via existing NFS road 2050400 (BMP 14.20, Road-4, Road-6).						
BOTANY						
Unit has not been surveyed due to time constraints. Unit has low probability of having sensitive plants. Unless surveys are conducted to confirm, activities may impact sensitive or rare plant individuals.						
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 Activities 13, 19, 23 and 24 in the POWLLA EIS 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.:	131_5.1R					
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.:	131_5.1R.3L					
Stream Class:	I, IV					
Channel Type:	MMO					

Unit 34

Protection: Category A, 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.: 131_5.7R.1R

Stream Class: I, IV

Channel Type: MMO

Protection: Category A, 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.: 131_5.7R.1L

Stream Class: I, IV

Channel Type: MMO

Protection: Category A, 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.: 131_5.7R.2R

Stream Class: I, IV

Channel Type: MMO

Protection: Category A, 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.: 131_5.1R.1R

Stream Class: IV

Channel Type: MMO

Protection: Category C

Flagging: G/W

Buffer (RMA):

Class IV for MMO: No buffer

Concerns: N/A

All Streams Protection/Mitigation Actions by Category:

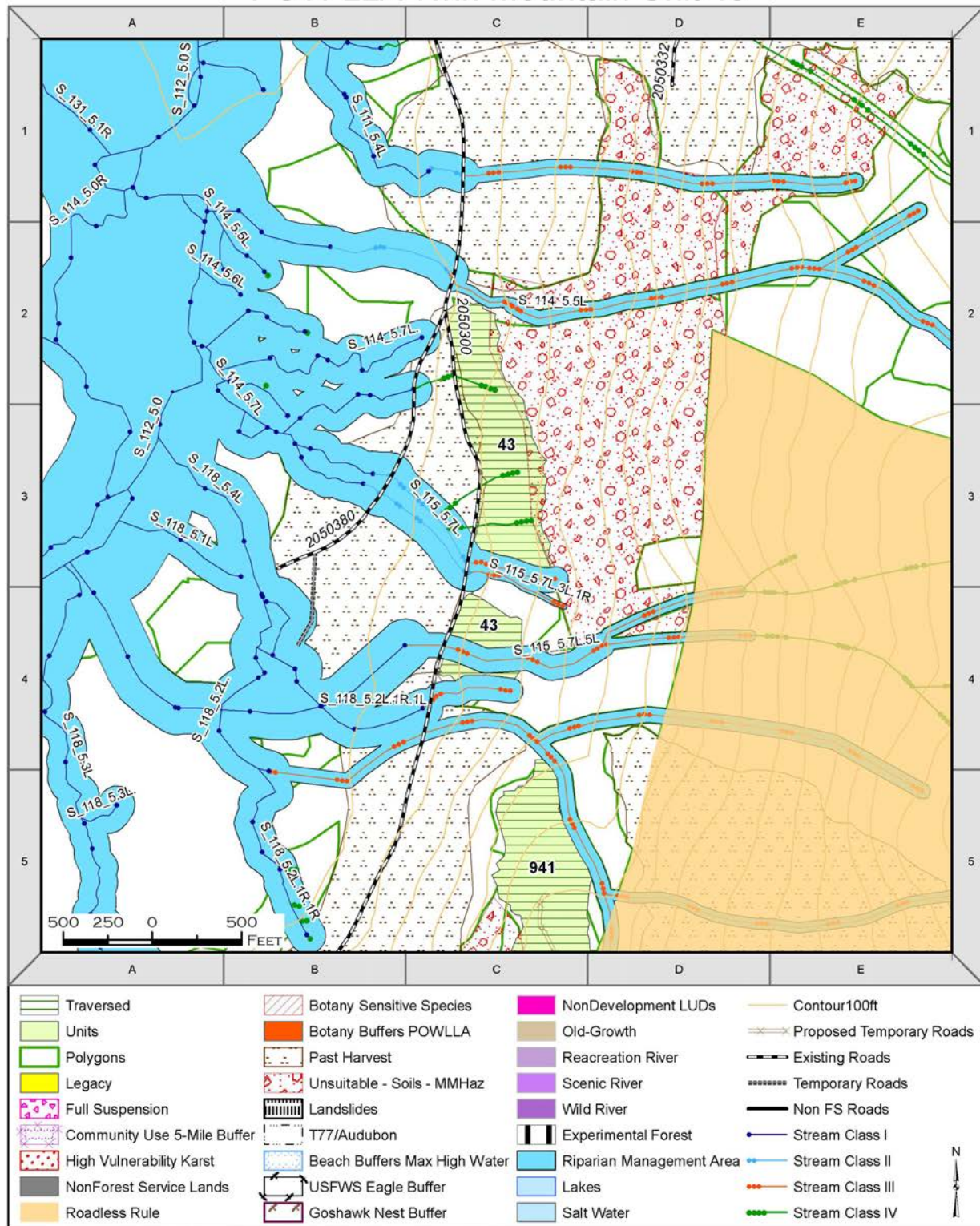
All Categories implement BMPs

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.

Unit 34
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
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 as proposed as of 6/28/19.
RECREATION
No recreation concerns, as proposed, as of 09 July 2019.
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 BMP 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). Forested wetlands are located along the boundary fringes of the unit (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4).
WILDLIFE
Goshawk surveys completed in 2016/2017. No detections. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 43



Unit 43						
Unit Number:	43	Total Harvest Unit Acres	14	Prescription:	EA	Harvest System: Cable
VCU Number:	5880	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 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. However, the planned harvest unit is less than 20 acres in size which eliminates 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 downhill 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 POWLLA EIS 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, 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.:	115_5.7L.1L					
Stream Class:	IV					
Channel Type:	HCO					

Unit 43

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

Stream Num.: 115_5.7L.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

Stream Num.: 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.: 115_5.7L.3L
 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

Stream Num.: 115_5.7L.3L.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: 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: N/A

Stream Num.: 118_5.2L.1R.1L
 Stream Class: I, III
 Channel Type: HCL, HCV
 Protection: Category A, B
 Flagging: B/W, O/W
 Buffer (RMA):
 Class I for HCL: 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

All Streams Protection/Mitigation Actions by Category:

Unit 43

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 as proposed as of 6/28/19.

RECREATION

No recreation concerns, as proposed, as of 09 July 2019.

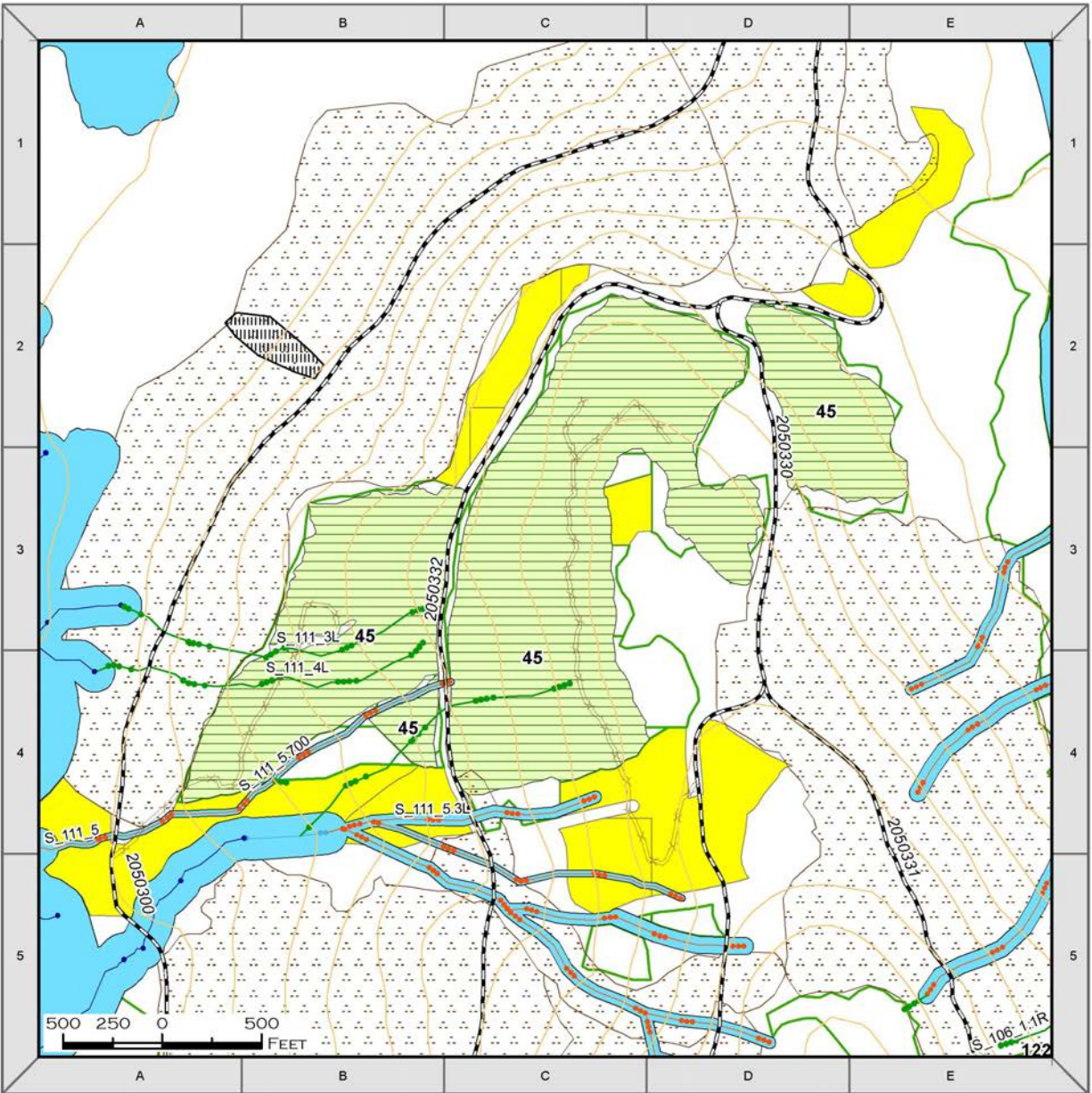
SOILS/WETLANDS

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 completed. No detections. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 45



Traversed	Botany Sensitive Species	NonDevelopment LUDs	Contour100ft
Units	Botany Buffers POWLLA	Old-Growth	Proposed Temporary Roads
Polygons	Past Harvest	Recreation River	Existing Roads
Legacy	Unsuitable - Soils - MMHaz	Scenic River	Temporary Roads
Full Suspension	Landslides	Wild River	Non FS Roads
Community Use 5-Mile Buffer	T77/Audubon	Experimental Forest	Stream Class I
High Vulnerability Karst	Beach Buffers Max High Water	Riparian Management Area	Stream Class II
NonForest Service Lands	USFWS Eagle Buffer	Lakes	Stream Class III
Roadless Rule	Goshawk Nest Buffer	Salt Water	Stream Class IV

Unit 45							
Unit Number:	45	Total Harvest Unit Acres	88.2	Prescription:	EA	Harvest System:	Shovel, Cable
VCU Number:	5880	LUD:	Timber Production		Net Harvest Volume (MBF):		2,037
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 planned harvest unit is greater than 20 acres in size, legacy retention will be implemented 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, uphill and downhill 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).							
BOTANY							
Portions of the unit have been surveyed for this project. No botany concerns were detected during surveys.							
However, some of this unit has not been surveyed due to time constraints. This unit has a low probability of having sensitive plants. However, unless surveys are completed to confirm, activities may impact sensitive or rare plant individuals.							
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 POWLLA EIS 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:	IV						
Channel Type:	HCO						
Protection:	Category C						
Flagging:	G/W						
Concerns:	NA						
Buffer (RMA):							
Class IV for HCO:	No buffer						

Unit 45

Concerns: N/A

Stream Num.: 111_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.: 111_5.700L
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_5.73L
Stream Class: I, II, III
Channel Type: HCM
Protection: Category C
Flagging: B/W, O/W
Buffer (RMA):
Class I for HCM: 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
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 Class IV crossing.

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 and 14.5.

GEOLOGY/KARST

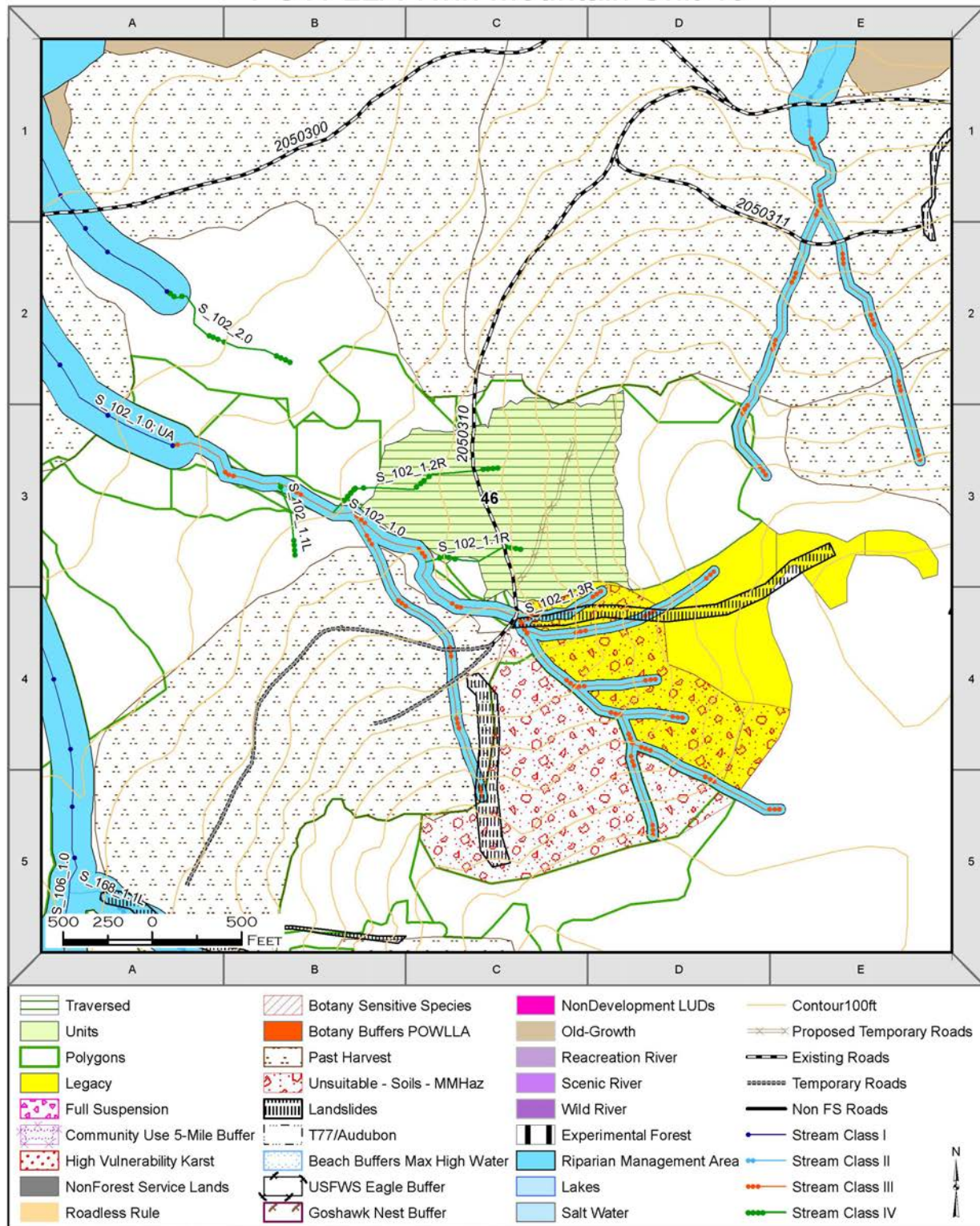
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.

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.

Unit 45
SCENERY
No scenery concerns as proposed as of 6/28/19.
RECREATION
No recreation concerns, as proposed, as of 09 July 2019.
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 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
May/June goshawk surveys completed. Possible detection in May/June surveys. Follow up survey 27 June 2019. July/August goshawk surveys have not been completed.
All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

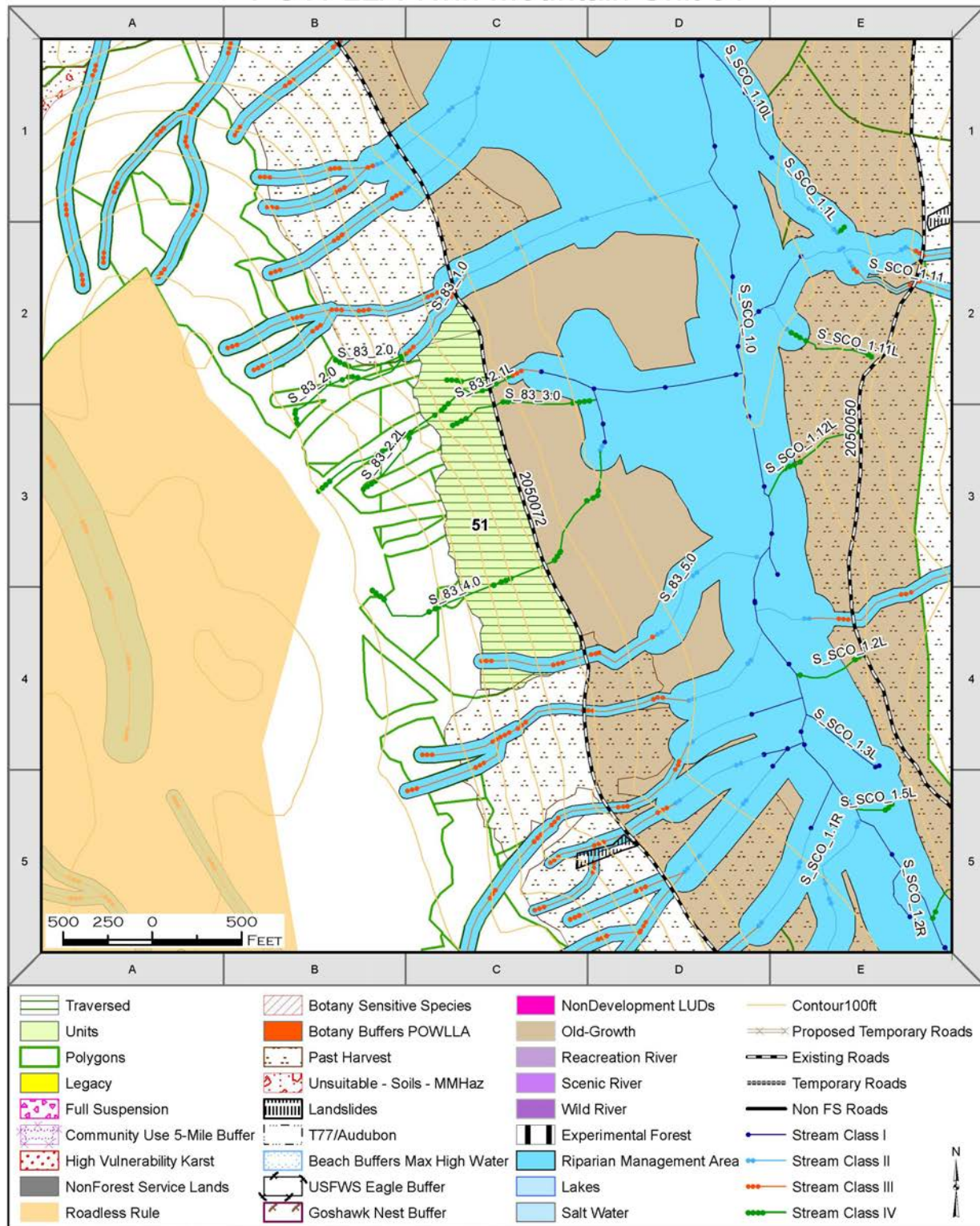
POW LLA Twin Mountain Unit 46



Unit 46	
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
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 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 as proposed as of 6/28/19.	
RECREATION	
No recreation concerns, as proposed, as of 09 July 2019.	
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 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	

Unit 46
(R10 BMP 13.9 and National Core Veg-4). 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). The temporary road traverses about a 0.1 acre of forested wetland/ emergent short sedge. Wetland avoidance was not feasible due to the location of the existing road, engineering constraints with steep ground, and wetland abundance along the existing road. Follow R10 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
May/June goshawk survey completed- no detections. July/August goshawk surveys have not been completed. Area functions as corridor. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

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):		530
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. However, the planned harvest unit is less than 20 acres in size which eliminates 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						
Unit has not been surveyed due to time constraints. Unit has low probability of having sensitive plants. Unless surveys are conducted to confirm, activities may impact sensitive or rare plant individuals.						
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 Activities 13, 19, 23 and 24 in the POWLLA EIS 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					
Stream Class:	III, IV					
Channel Type:	HCM, HCO					
Protection:	Category B, C					
Flagging:	O/W, G/W					
Buffer (RMA):	Class III for HCM: To the top of the slope break; Class IV for HCO: No Buffer					
Concerns:	N/A					
Stream Num.:	83_2.0					
Stream Class:	IV					
Channel Type:	HCO					
Protection:	Category C					

Unit 51

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

Stream Num.: 83_2.1L
 Stream Class: III, IV
 Channel Type: HCD, HCO
 Protection: Category B, C
 Flagging: O/W, G/W
 Buffer (RMA): Class III for HCD: To the top of the slope break; 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_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.: 83_4.0
 Stream Class: IV
 Channel Type: HCO, HCL, HCM
 Protection: Category C
 Flagging: G/W
 Buffer (RMA): Class IV for HC: No Buffer
 Concerns: N/A

Stream Num.: 83_5.0
 Stream Class: III
 Channel Type: HCD
 Protection: Category B
 Flagging: O/W
 Buffer (RMA): Class III for HCD: To the top of the 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.

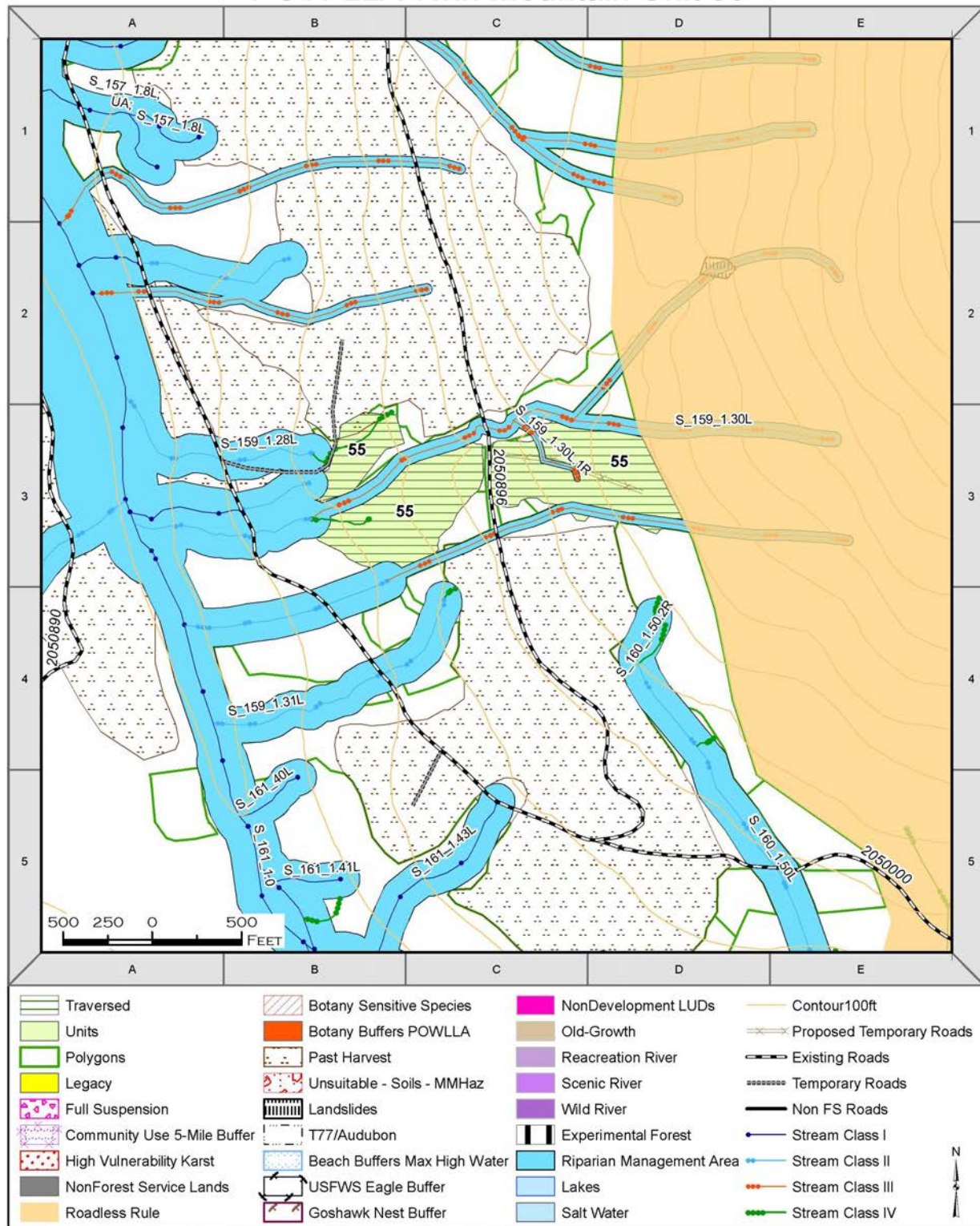
Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.

ROAD/STREAM CROSSING SUMMARY

There are no temporary roads planned for this unit.

Unit 51
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 as proposed as of 6/28/19.
RECREATION
No recreation concerns, as proposed, as of 09 July 2019.
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 have been completed. No goshawk detections. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 55



Unit 55							
Unit Number:	55	Total Harvest Unit Acres	22.3	Prescription:	EA	Harvest System:	Shovel, Cable
VCU Number:	5890	LUD:	Timber Production		Net Harvest Volume (MBF):		435
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 uphill and downhill yarding to landings along NFSR 2050896.							
ENGINEERING/SYSTEM ROADS							
Access via existing NFS road 2050896 (BMP 14.20, Road-4, Road-6).							
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 Activities 13, 19, 23 and 24 in the POWLLA EIS 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_1.28L						
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_1.30L						
Stream Class:	II, III						
Channel Type:	HCL, HCD						
Protection:	Category A, B						
Flagging:	O/W						
Buffer (RMA):	Class II for HCL II: 100 feet or to the top of the side-slope break, whichever is greater; Class III for HCD: To the top of the side-slope break						
Concerns:	N/A						

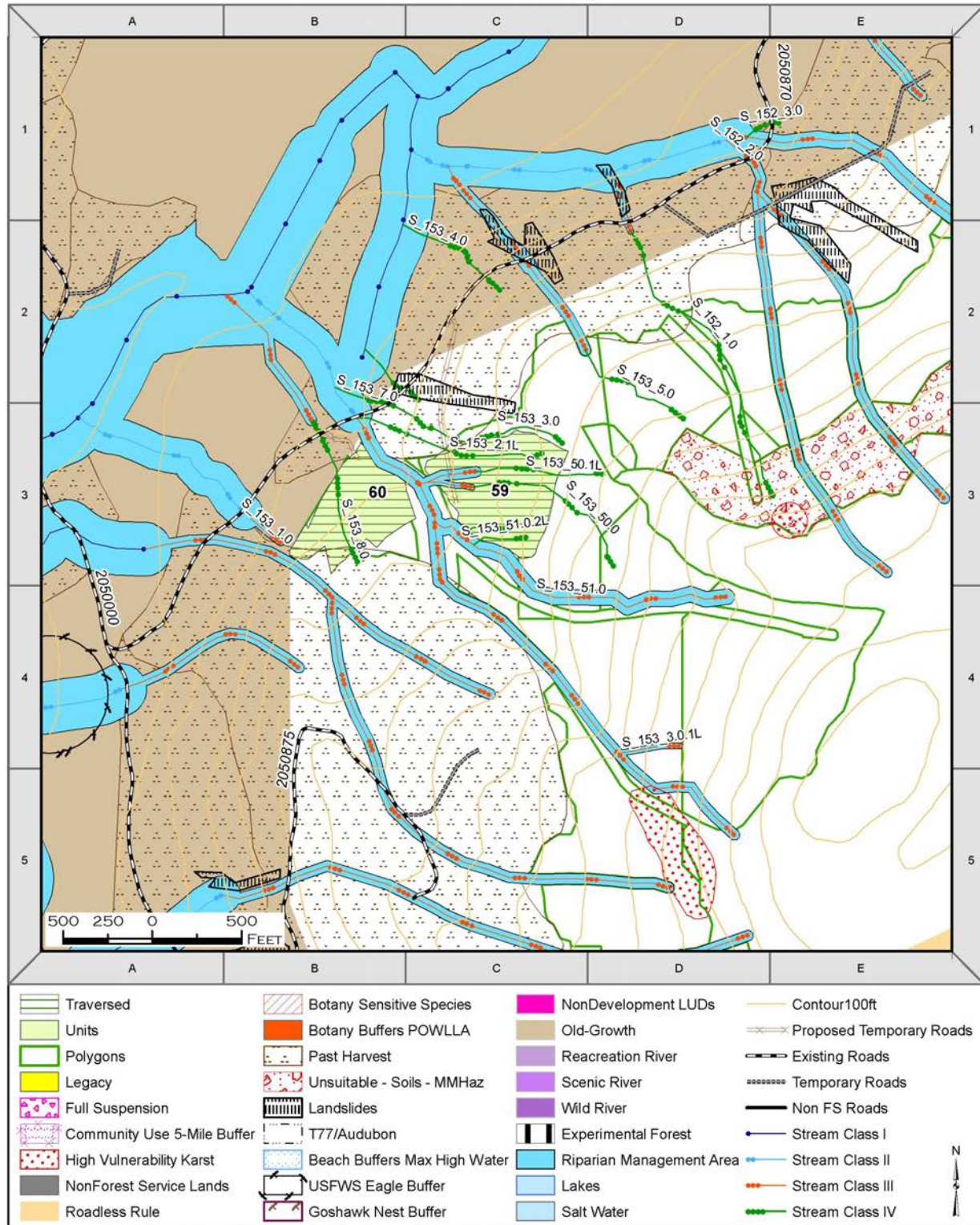
Unit 55	
Stream Num.:	159_1.30L.1R (Map Location B-3)
Stream Class:	IV
Channel Type:	HCO
Protection:	Category C
Flagging:	G/W
Buffer (RMA):	Class IV for HCO: No Buffer
Concerns:	N/A
Stream Num.:	159_1.30L.2R (Map Location C-3)
Stream Class:	III
Channel Type:	HCO
Protection:	Category B
Flagging:	O/W
Buffer (RMA):	Class III for HCO: To the top of the 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 temporary roads planned for this unit.	
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 as proposed as of 6/28/19.	
RECREATION	
No recreation concerns, as proposed, as of 09 July 2019.	
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 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). 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). 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. No goshawk detections. Marble murrelet activity in unit; may require 600 foot buffer. Follow up murrelet surveys will be conducted in 2019 to be conducted to determine sub canopy behavior.	

Unit 55

Area functions as corridor.

All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 59



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):		183
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.						
TIMBER/LOGGING						
This unit is planned for downhill 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, 0.22 miles (BMPs 14.5, Road-3, Road-5, Road-6).						
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 Activities 13, 19, 23 and 24 in the POWLLA EIS 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_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.:	159_3.0					
Stream Class:	IV					
Channel Type:	HCL					
Protection:	Category C					
Flagging:	G/W					
Buffer (RMA):	Class IV for HCL: No Buffer					
Concerns:	Blowdown					

Unit 59

Stream Num.: 153_50.0
 Stream Class: III
 Channel Type: HCL
 Protection: Category B
 Flagging: O/W
 Buffer (RMA): Class III for HCL: To the top of the side-slope break
 Concerns: N/A

Stream Num.: 153_50.1L
 Stream Class: III, IV
 Channel Type: HCM, HCO
 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.: 153_51.0
 Stream Class: III
 Channel Type: HCD
 Protection: Category C
 Flagging: O/W
 Buffer (RMA): Class III for HCD: To the top of the side-slope break
 Concerns: N/A

Stream Num.: 153_51.0.1L
 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.: 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

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.

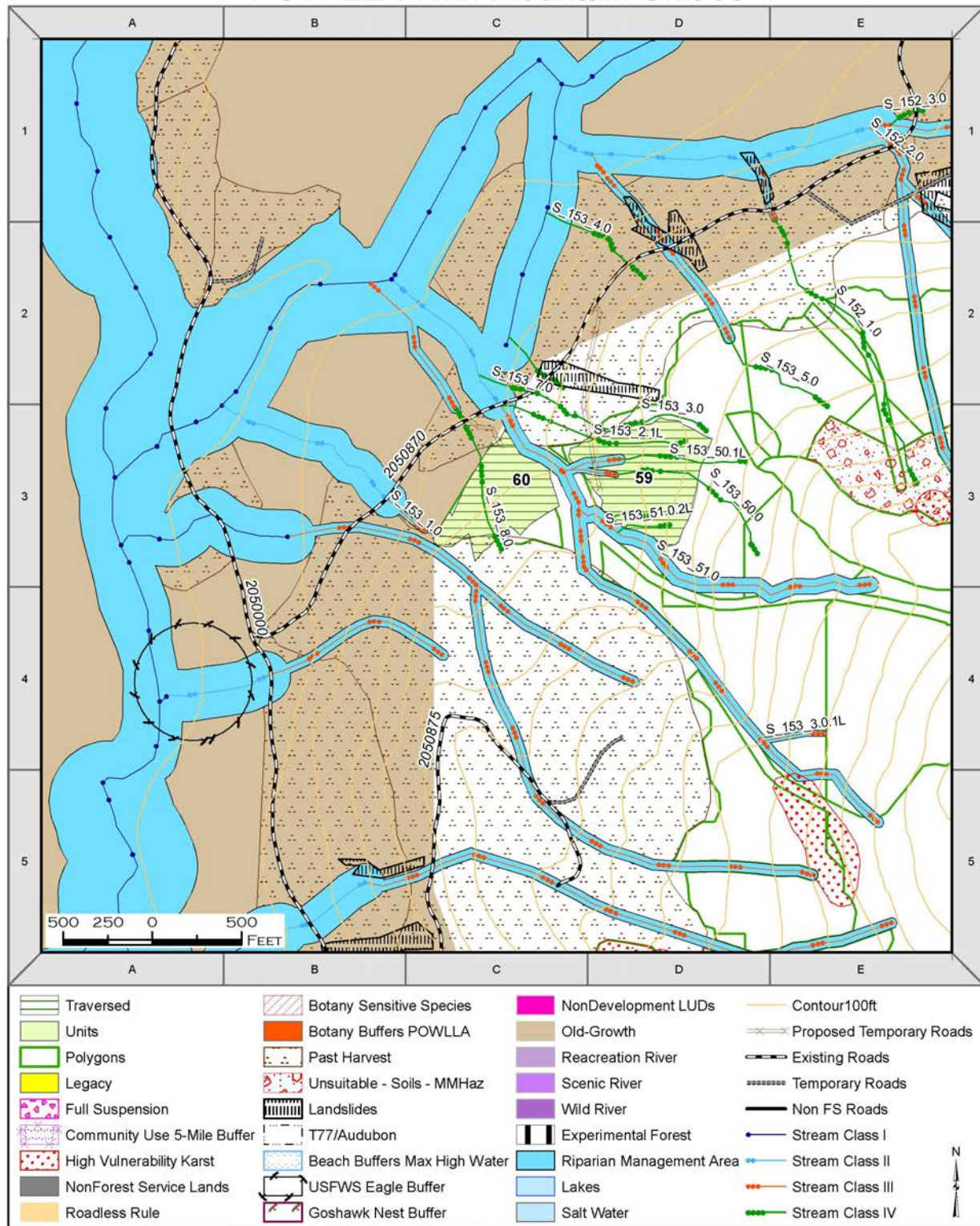
Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.

ROAD/STREAM CROSSING SUMMARY

Temporary road is expected to have four Class IV 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 and 14.5.

Unit 59
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 as proposed as of 6/28/19.
RECREATION
No recreation concerns, as proposed, as of 09 July 2019.
SOILS/WETLANDS
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 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
Surveys have been completed. No goshawks detected. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 60



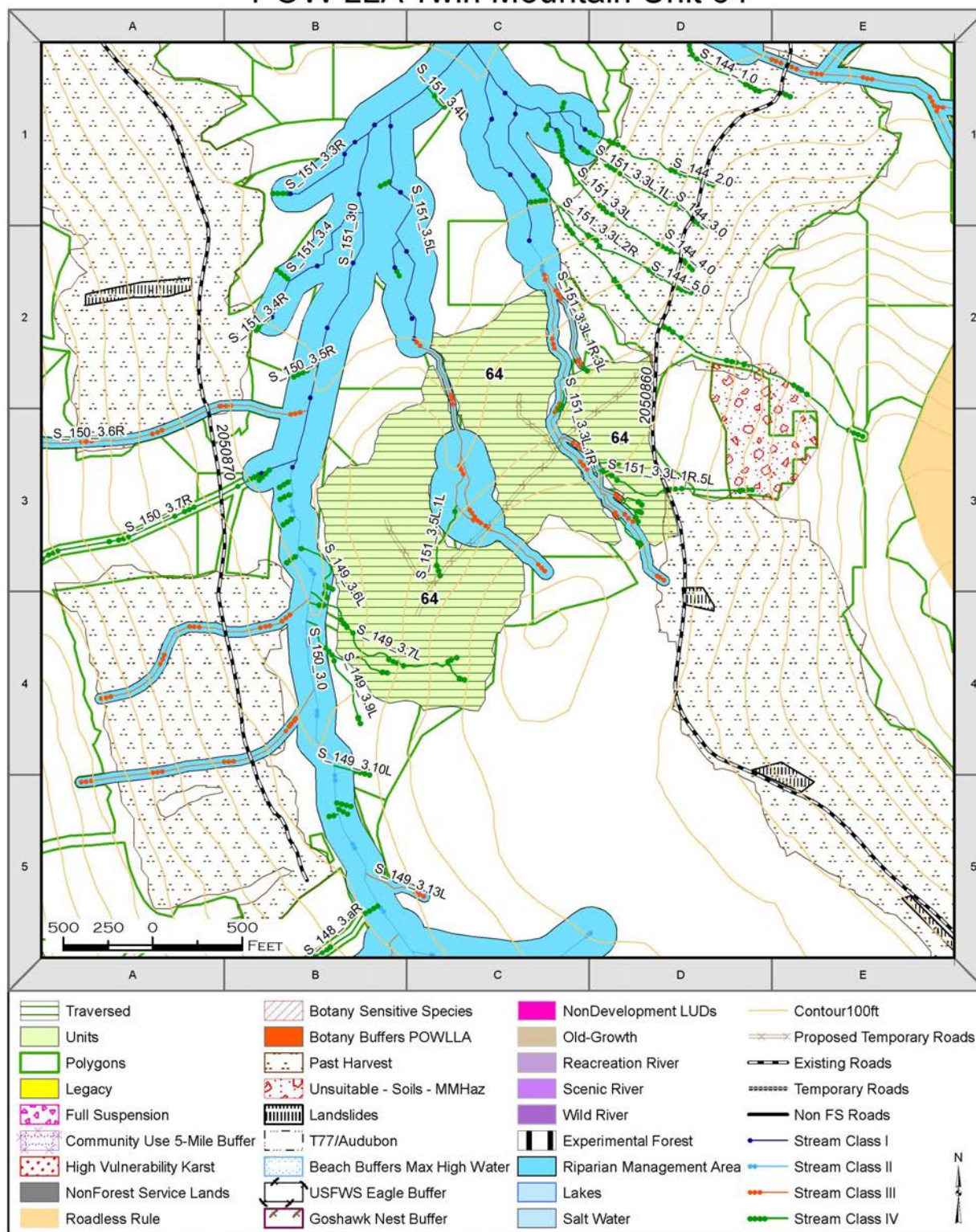
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Unit 60	
Flagging:	O/W
Buffer (RMA):	
Class III for HCM:	To the top of the side-slope break
Concerns:	N/A
Stream Num.:	153_8.0
Stream Class:	IV
Channel Type:	HCO
Protection:	Category C
Flagging:	G/W
Buffer (RMA):	Class IV for HCO: No buffer
Concerns:	N/A
Stream Num.:	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
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	
Surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.	
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 as proposed as of 7/2/19.	
RECREATION	
No recreation concerns, as proposed, as of 09 July 2019.	
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 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). 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 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.	
WILDLIFE	

Unit 60

May/June goshawk surveys complete. No detections. July/August surveys have not been completed. Unit adjacent to OGR. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 64



Unit 64

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.: 149_3.6L.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_3.7L
 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.: 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.: 151_3.5L.1L
 Stream Class: I, III
 Channel Type: HCO, HCO, AFH, HCD
 Protection: Category A, B

Unit 64

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

Stream Num.: 51_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.: 151_3.3L.1R
 Stream Class: II, II, III
 Channel Type: HCM, HCM, HCL
 Protection: Category A, 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
 Class III for HCL: To the top of the side slope break
 Concerns: N/A

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

Stream Num.: 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: 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.1L

Unit 64	
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.2L
Stream Class:	IV
Channel Type:	HCO
Protection:	C
Flagging:	G/W
Buffer (RMA):	Class IV for HCO: No buffer
Concerns:	N/A
Stream Num.:	151_3.3L.1R.1R
Stream Class:	III, IV
Channel Type:	HCO, HCO
Protection:	B, 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
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 crossing at Class III Stream Num.151_3.3L.1R should be made below the confluence with Stream Num. 151_3.3L.1R.5L. Temporary road crossing at Stream Num. 151_3.5L.1L crosses unstable ground, any crossing structure placed here should be removed immediately following operations. Should additional 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 as proposed as of 6/28/19.	
RECREATION	
No recreation concerns, as proposed, as of 09 July 2019.	
SOILS/WETLANDS	

Unit 64

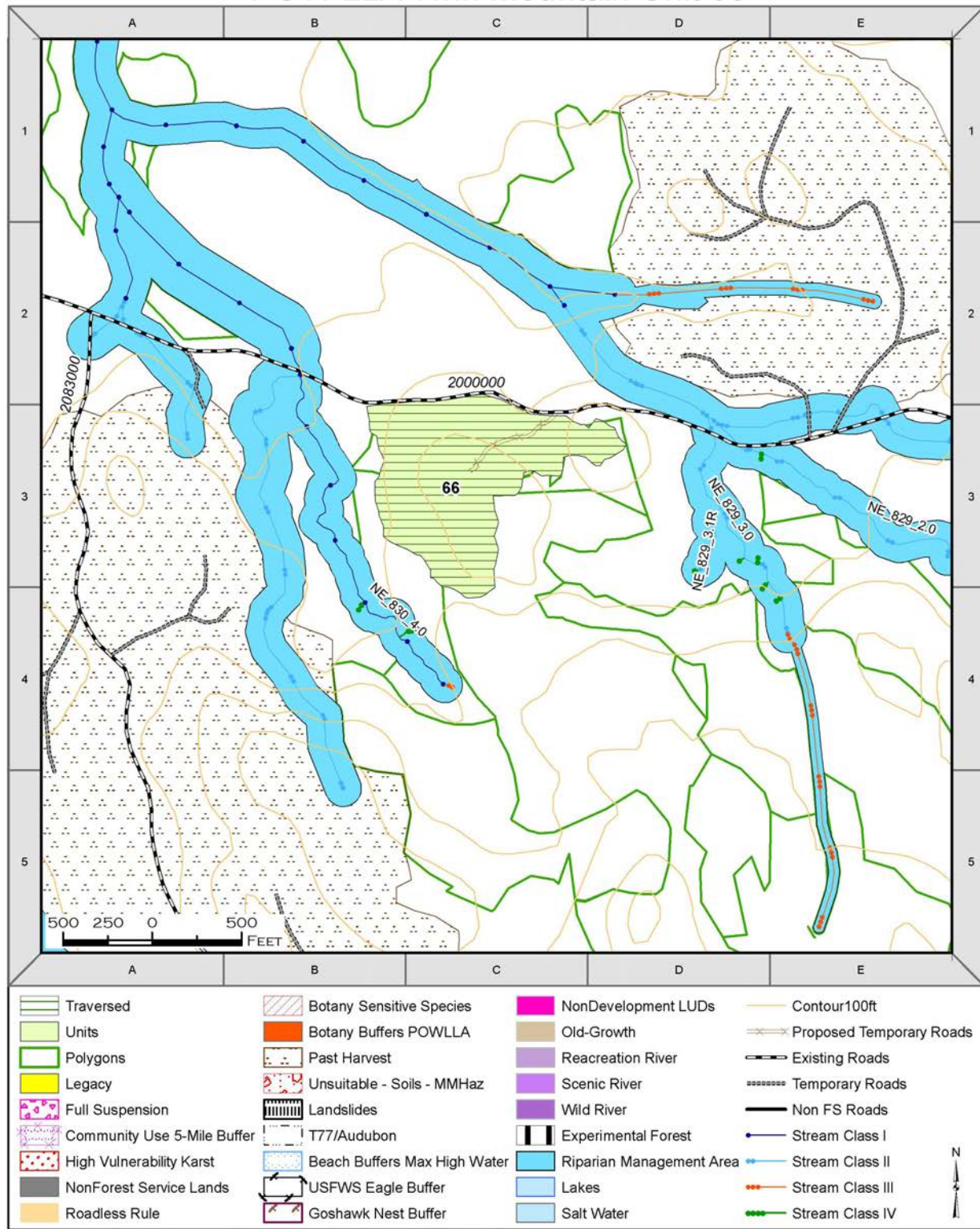
Slopes range from gentle to >72%. Most areas are 25 to 55% with small rock outcrop bands with slopes 65 to >72%. Split yarding is also recommended for a small debris torrent was found in the unit along a stream. The soils and wetlands are suitable for shovel and cable yarding with a minimum of partial 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 of 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

May/June goshawk survey had a possible detection in this unit. July/August surveys have not been completed. Bear den(s) in unit.

All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 66



Unit 66							
Unit Number:	66	Total Harvest Unit Acres	19.7	Prescription:	EA	Harvest System:	Shovel, Cable
VCU Number:	5300	LUD:	Timber Production		Net Harvest Volume (MBF):		455
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.							
TIMBER/LOGGING							
This unit is planned for a combination of shovel and uphill 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							
Portions of the unit have been surveyed for this project. No botany concerns were detected during surveys.							
However, some of this unit has not been surveyed due to time constraints. This unit has low probability of having sensitive plants. However, unless surveys are completed to confirm, activities may impact sensitive or rare plant individuals.							
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 POWLLA EIS 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 known streams within 200 feet of this unit. Notify the Fish Biologist or Hydrologist if new streams are discovered.							
ROAD/STREAM CROSSING SUMMARY							
There are no planned temporary roads, or streams in this unit.							
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							

Unit 66

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 as proposed as of 6/28/19.

RECREATION

No recreation concerns, as proposed, as of 09 July 2019.

SOILS/WETLANDS

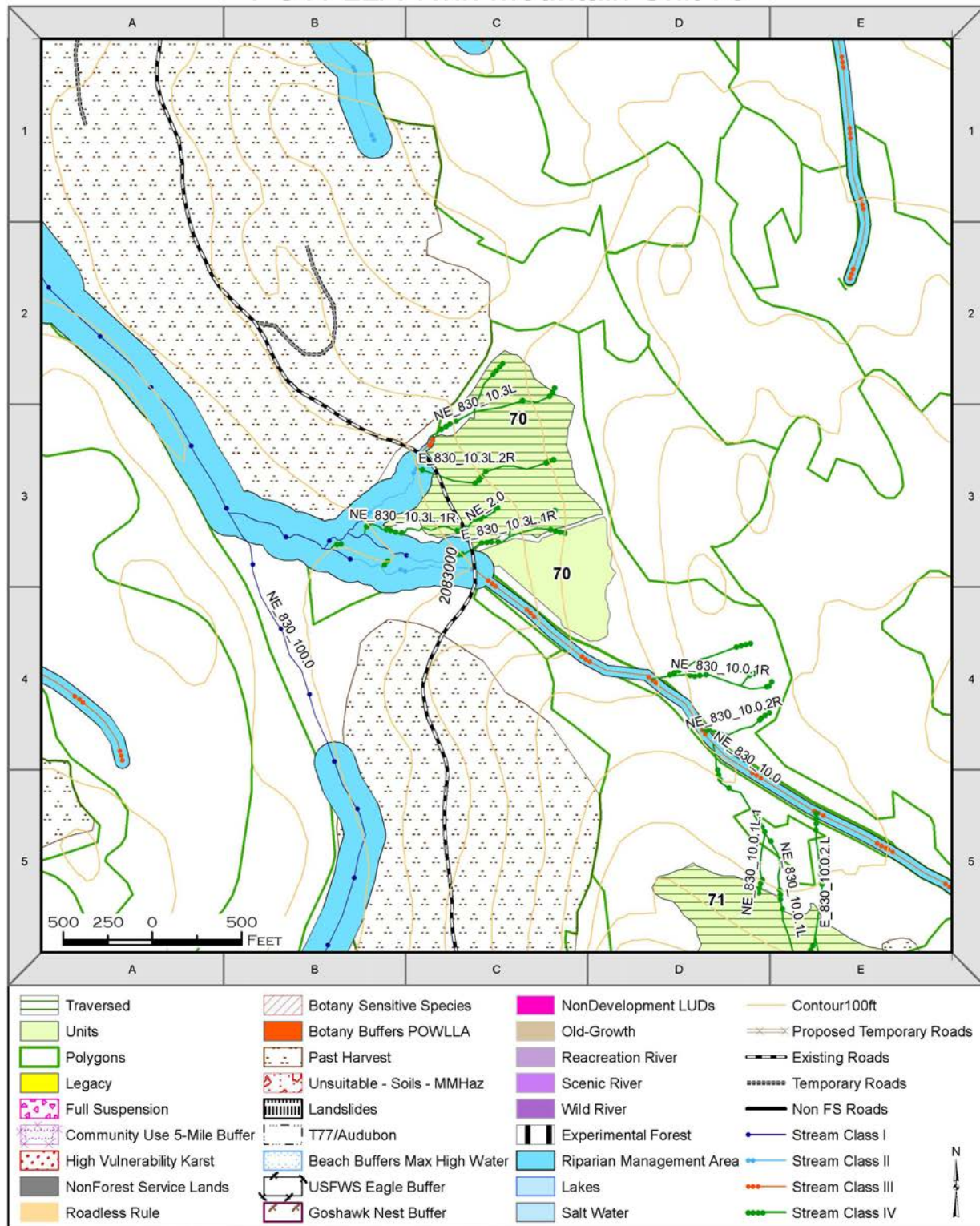
Slopes are less than 55%. The soils and wetlands are suitable for a minimum of partial suspension cable yarding and shovel yarding (R10 BMPs 12.5, 13.5, and 13.9 and National Core BMPs Plan-2, AqEco-2, AqEco-4, Veg-1, Veg-2, Veg-5, and Veg-6). Follow shovel yarding guidelines outlined in the activity 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

June goshawk surveys have been completed. July/August surveys have not been completed.

All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 70



Unit 70							
Unit Number:	70	Total Harvest Unit Acres	15.9	Prescription:	EA	Harvest System:	Shovel, Cable
VCU Number:	5300	LUD:	Timber Production		Net Harvest Volume (MBF):		367
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 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 a combination of shovel and downhill yarding to landings located along NFSR 2083000.							
ENGINEERING/SYSTEM ROADS							
Access via existing NFS road 2083000 (BMP 14.20, Road-4, Road-7).							
BOTANY							
Unit has not been surveyed due to time constraints. Unit has low probability of having sensitive plants. Unless surveys are conducted to confirm, activities may impact sensitive or rare plant individuals.							
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 POWLLA EIS 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_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.:	830_10.0						
Stream Class:	II, III						
Channel Type:	HCM						
Protection:	Category A, B						
Flagging:	B/W, O/W						

Unit 70

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.

Concerns: N/A

Stream Num.: 830_10.3L

Stream Class: I, II, III, IV

Channel Type: MMO, HCO

Protection: Category A, B, C

Flagging: B/W, O/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 III for HCO: 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, 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

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_10.4L

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:

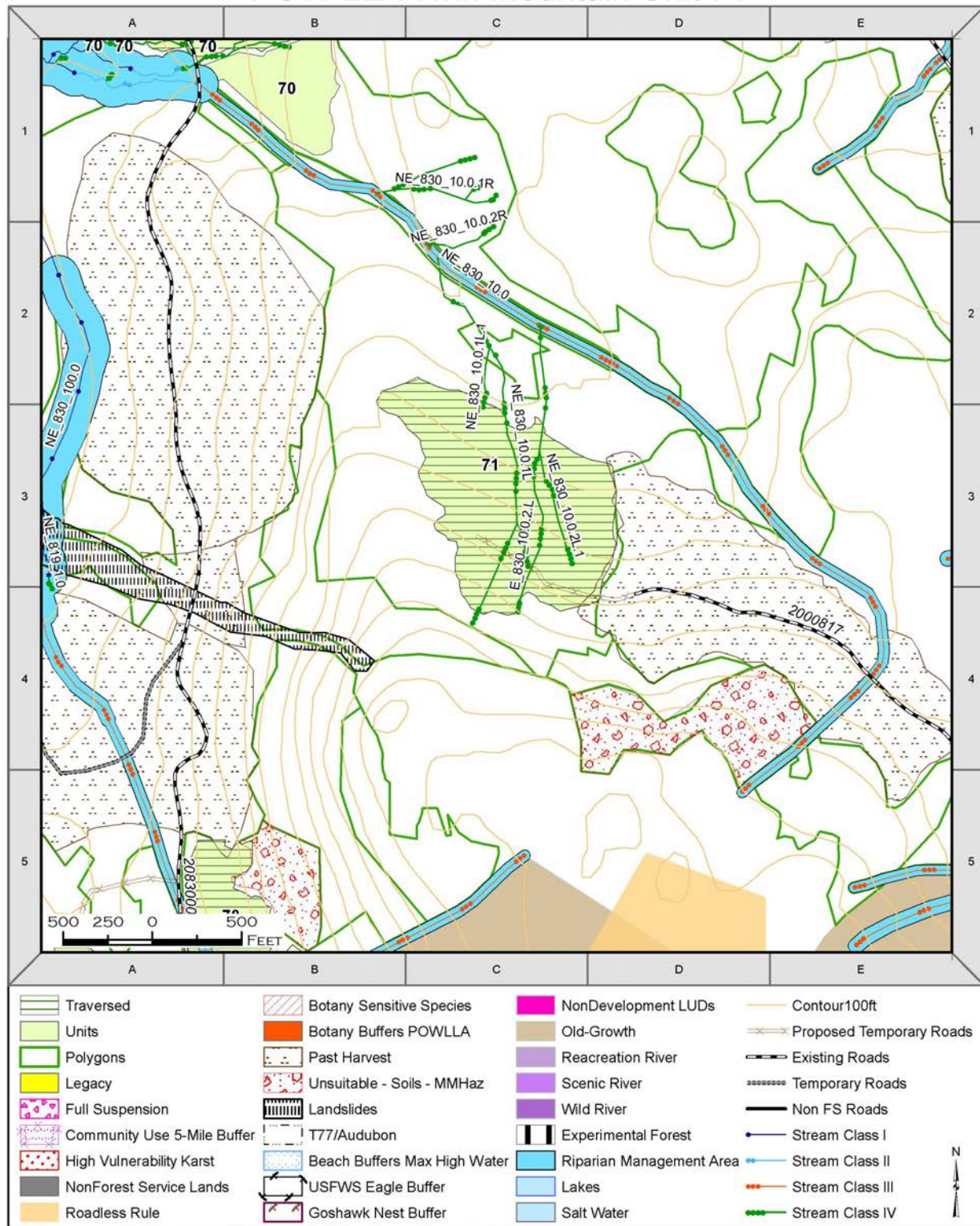
All Categories implement BMPs

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.

Unit 70
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
Surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.
Unit is on established road with many crossings
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 as proposed as of 6/28/19.
RECREATION
No recreation concerns, as proposed, as of 09 July 2019.
SOILS/WETLANDS
Slopes are less than 55%. All slopes are suitable for harvest with a minimum of partial suspension with 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
June goshawk surveys completed. July/August surveys have not been completed.
All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 71



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):		537
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 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. 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 Activities 13, 19, 23 and 24 in the POWLLA EIS 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_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.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.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. 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 in this unit has two Class IV 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 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 as proposed as of 6/28/19.	
RECREATION	

Unit 71
No recreation concerns, as proposed, as of 09 July 2019.
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 BMPS 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
June goshawk surveys have been completed. July/August goshawk surveys have not been completed.
All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

Map of the NE 831-1.0 area showing various land management boundaries, roads, and environmental features. The map includes a grid with letters A-E and numbers 1-5. A scale bar at the bottom left indicates 500, 250, 0, and 500 feet. A legend at the bottom lists various land management categories and symbols. The map shows a network of roads, including existing and proposed temporary roads, and various land use designations such as riparian management areas, stream classes, and sensitive species buffers. Contour lines are also shown, indicating elevation changes across the area.

Legend:

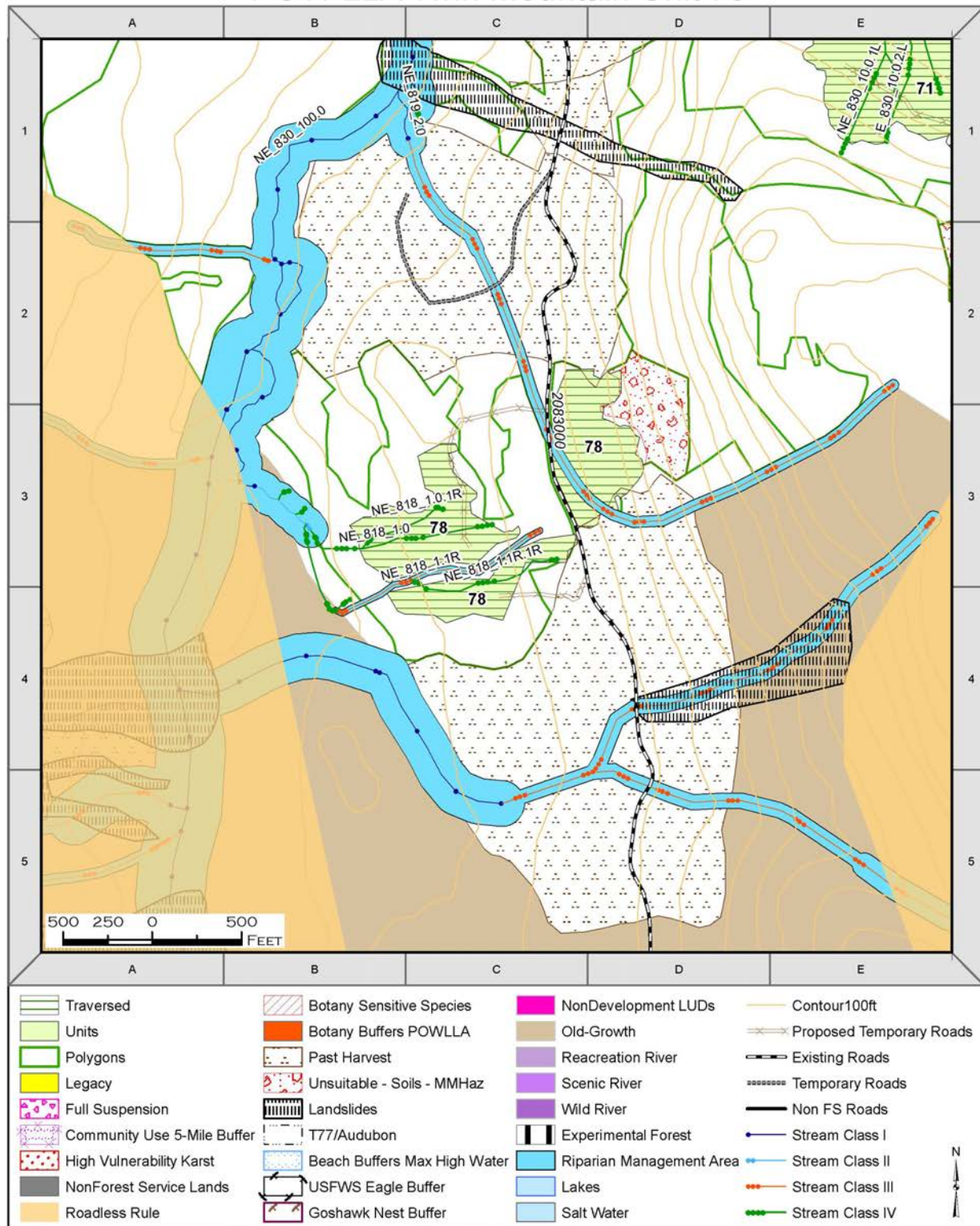
- Traversed
- Units
- Polygons
- Legacy
- Full Suspension
- Community Use 5-Mile Buffer
- High Vulnerability Karst
- NonForest Service Lands
- Roadless Rule
- Botany Sensitive Species
- Botany Buffers POWLLA
- Past Harvest
- Unsuitable - Soils - MMHaz
- Landslides
- T77/Audubon
- Beach Buffers Max High Water
- USFWS Eagle Buffer
- Goshawk Nest Buffer
- NonDevelopment LUDs
- Old-Growth
- Recreation River
- Scenic River
- Wild River
- Experimental Forest
- Riparian Management Area
- Lakes
- Salt Water
- 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 74							
Unit Number:	74	Total Harvest Unit Acres	7.1	Prescription:	EA	Harvest System:	Shovel, Cable
VCU Number:	5300	LUD:	Modified Landscape		Net Harvest Volume (MBF):		162
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 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 a combination of shovel and uphill 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).							
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 POWLLA EIS 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_1.3L						
Stream Class:	III, IV						
Channel Type:	HCM, HCO						
Protection:	Category B, C						
Flagging:	HCM, HCO						
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.:	831_1.3L.1L						
Stream Class:	IV						
Channel Type:	HCO						
Protection:	Category A						
Flagging:	G/W						

Unit 74	
Buffer (RMA):	Class I for HCO: No Buffer
Concerns:	N/A
Stream Num.:	831_1.3L.2L
Stream Class:	IV
Channel Type:	HCO
Protection:	Category A
Flagging:	G/W
Buffer (RMA):	Class I for HCO: No Buffer
Concerns:	N/A
Stream Num.:	831_1.4L
Stream Class:	IV
Channel Type:	HCO
Protection:	Category A
Flagging:	G/W
Buffer (RMA):	Class I 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 no stream crossings for the segment of temporary road that is planned.	
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 as proposed as of 6/28/19.	
RECREATION	
No recreation concerns, as proposed, as of 09 July 2019.	
SOILS/WETLANDS	
Slopes are mostly gentle up to 55%. The soils and wetlands are suitable for a minimum of partial suspension cable yarding and shovel 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. Follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMP 13.9 and National Core Veg-4).	
WILDLIFE	
May/June goshawk surveys have been completed. July/August goshawk surveys have not been completed.	
All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.	

POW LLA Twin Mountain Unit 78



Unit 78							
Unit Number:	78	Total Harvest Unit Acres	18.7	Prescription:	EA	Harvest System:	Shovel, Cable
VCU Number:	5300	LUD:	Timber Production, Modified Landscape		Net Harvest Volume (MBF):		419
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 a combination of shovel, uphill and downhill yarding to landings located along proposed temporary roads off of NFSR 2083000.							
ENGINEERING/SYSTEM ROADS							
Access via existing NFS road 2083000 (BMP 14.20, Road-4, Road-7). New temporary road construction, 0.35 miles (BMPs 14.5, Road-3, Road-5, Road-6, Road-7).							
BOTANY							
Unit has not been surveyed due to time constraints. Unit has low probability of having sensitive plants. Unless surveys are conducted to confirm, activities may impact sensitive or rare plant individuals.							
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 POWLLA EIS 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_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.:	818_1.0.1R						
Stream Class:	IV						
Channel Type:	HCO						
Protection:	Category C						
Flagging:	G/W						
Buffer (RMA):	Class IV for HCO: No Buffer						
Concerns:	N/A						

Unit 78

Stream Num.: 818_1.1R
 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.: 818_1.1R.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.: Map Location C-3 and D-3
 Stream Class: III
 Channel Type: HCM
 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.: 818_3.0 (not yet mapped, Map Location C-4)
 Stream Class: I, III
 Channel Type: HCL, HCM
 Protection: Category A, B
 Flagging: B/W, O/W
 Buffer (RMA): Class I 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

Surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

1 class 4 crossing

GEOLOGY/KARST

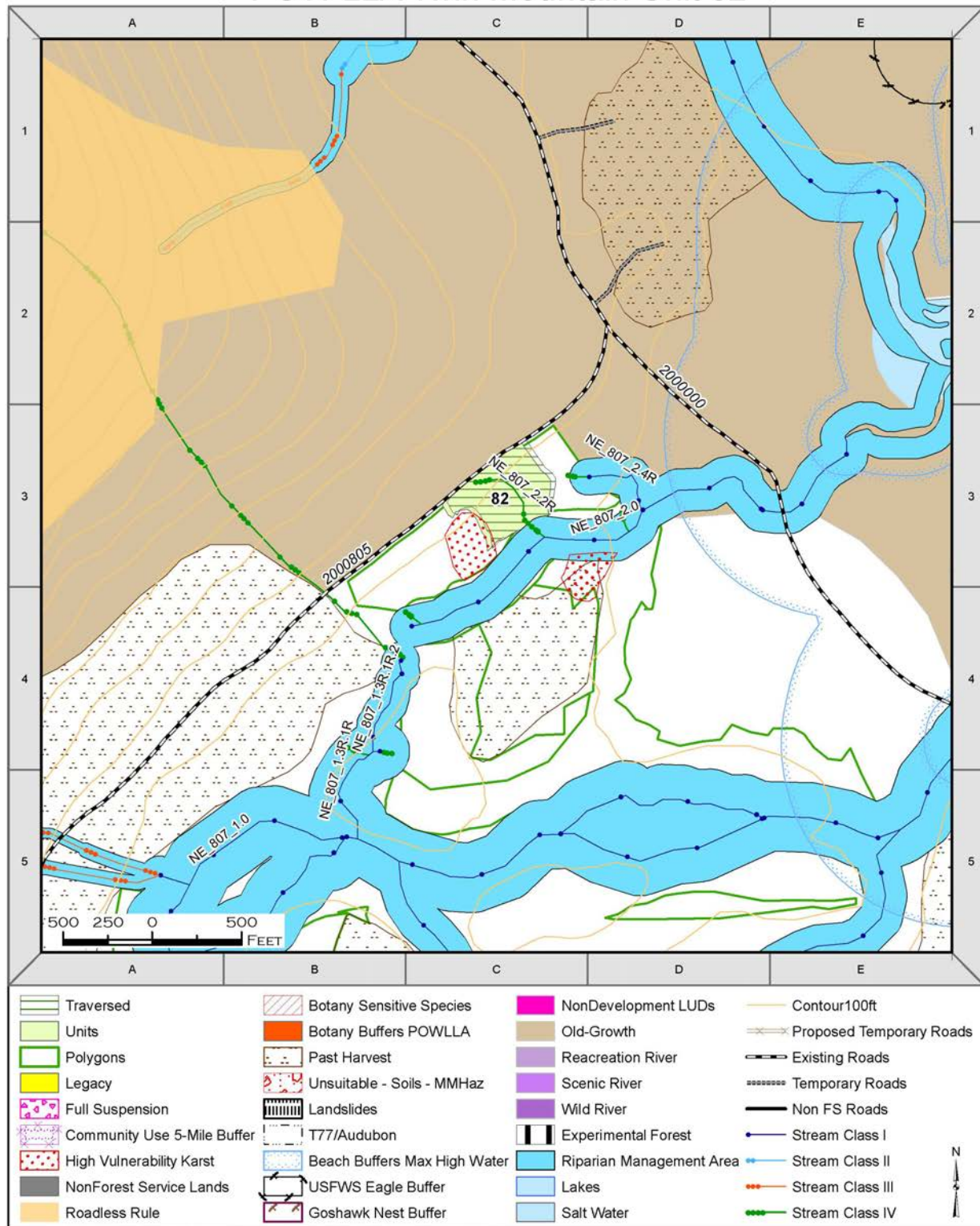
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.

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

Unit 78
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 as proposed as of 6/28/19.
RECREATION
No recreation concerns, as proposed, as of 09 July 2019.
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). The proposed temporary road traverses about ¾ of an acre of forested wetland outside of the unit and about ¼ of an acre inside the unit. Wetland avoidance was not feasible due to the location of the existing road. Follow R10 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
June goshawk surveys have been completed. July/August goshawk surveys have not been completed. Area functions as elevational corridor. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 82

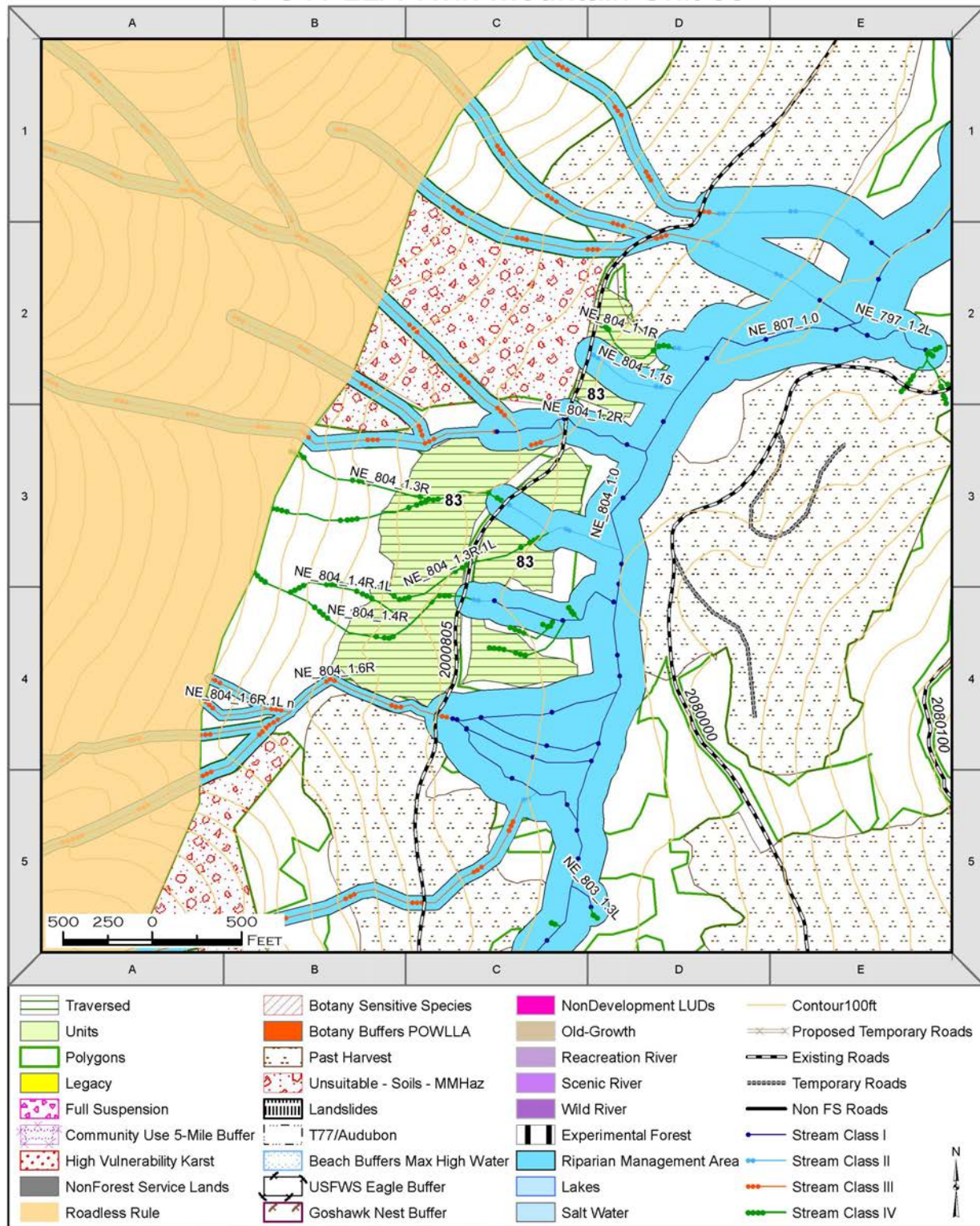


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Unit 82							
Unit Number:	82	Total Harvest Unit Acres	4.4	Prescription:	EA	Harvest System:	Shovel
VCU Number:	5330	LUD:	Modified Landscape, Timber Production		Net Harvest Volume (MBF):		106
Summary of Concerns, Responses, BMPs, and Mitigations							
SILVICULTURE							
Old-growth stands of this type are dominated by western hemlock 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.							
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 POWLLA EIS 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:	IV						
Channel Type:	PAB						
Protection:	Category C						
Flagging:	G/W						
Buffer (RMA):							

Unit 82
Class IV for PAB: 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
N/A
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 this 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 as proposed as of 6/28/19.
RECREATION
No recreation concerns, as proposed, as of 09 July 2019.
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
June goshawk surveys have been completed. July/August goshawk surveys have not been completed. Unit adjacent to OGR. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 83



Unit 83							
Unit Number:	83	Total Harvest Unit Acres	34.6	Prescription:	EA	Harvest System:	Shovel, Cable
VCU Number:	5330	LUD:	Timber Production, Modified Landscape		Net Harvest Volume (MBF):		849
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.							
TIMBER/LOGGING							
This unit is planned for a combination of shovel and downhill yarding to landings located along NFSR 2000805.							
ENGINEERING/SYSTEM ROADS							
Access via existing NFS road 2000805 (BMP 14.20, Road-4, Road-7).							
BOTANY							
Unit has not been surveyed due to time constraints. Unit has low probability of having sensitive plants. Unless surveys are conducted to confirm, activities may impact sensitive or rare plant individuals.							
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 Activities 13, 19, 23 and 24 in the POWLLA EIS 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:	FPM, MMM						
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. 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_1.1R						
Stream Class:	II, IV						
Channel Type:	HCO						
Protection:	Category A, C						
Flagging:	B/W, G/W						

Unit 83

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.: 804_1.2R
 Stream Class: I, III
 Channel Type: HCM, HCD
 Protection: Category A, B
 Flagging: B/W, O/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 HCD: To the top of the side-slope break.
 Concerns: Blowdown

Stream Num.: 804_1.2R.1L
 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: Blowdown

Stream Num.: 804_1.3R
 Stream Class: II, IV
 Channel Type: HCO
 Protection: Category A, 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.: 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: N/A

Stream Num.: 804_1.4R
 Stream Class: I, II, IV
 Channel Type: MMO, HCO
 Protection: Category A, C
 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. Class IV for HCO: No buffer.
 Concerns: N/A

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: N/A

Stream Num.: 804_1.4R.1R
 Stream Class: IV
 Channel Type: HCO
 Protection: Category C
 Flagging: G/W

Unit 83

Buffer (RMA): Class IV for HCO: No buffer.
Concerns: N/A

Stream Num.: 804_1.4R.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.: 804_1.6R
Stream Class: I, III
Channel Type: AFM, HCD
Protection: Category A, 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 HCD: to the top of the side-slope break.
Concerns: N/A

Stream Num.: 804_1.6R.1L
Stream Class: II
Channel Type: MMO, HCO
Protection: Category A, C
Flagging: B/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.
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 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.

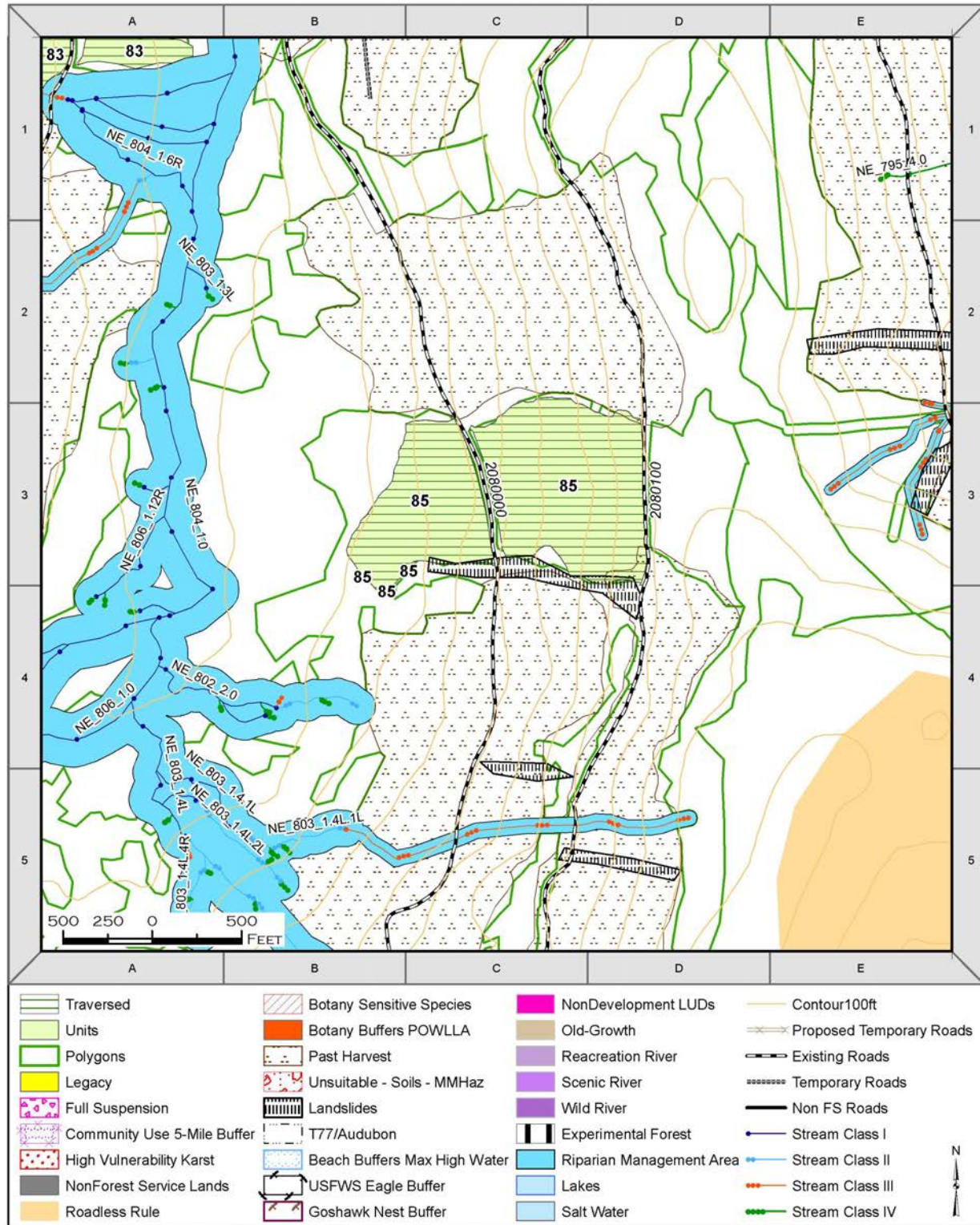
HERITAGE RESOURCES

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

Unit 83
Surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.
RECREATION
No recreation concerns, as proposed, as of 09 July 2019.
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 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 BMPS 12.5 and 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4).
WILDLIFE
June goshawk surveys have been completed. July/August goshawk surveys have not been completed.
All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

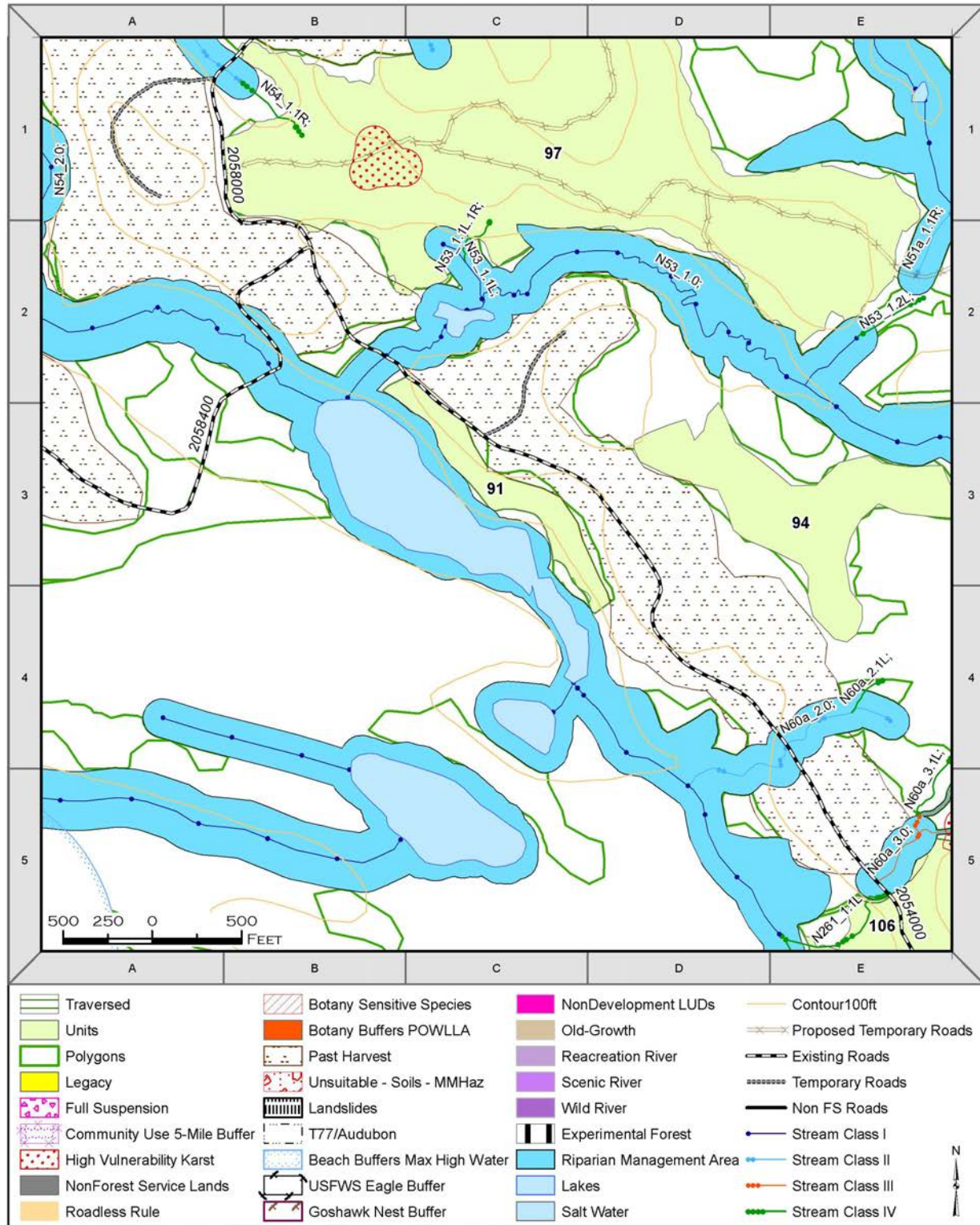
POW LLA Twin Mountain Unit 85



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):		675
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.							
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							
Unit has not been surveyed due to time constraints. Unit has low probability of having sensitive plants. Unless surveys are conducted to confirm, activities may impact sensitive or rare plant individuals.							
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 Activities 13, 19, 23 and 24 in the POWLLA EIS 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							
Surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.							
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 85
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 are anticipated. 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 as proposed as of 6/28/19.
RECREATION
No recreation concerns, as proposed, as of 09 July 2019.
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
June goshawk surveys have been completed. July/August goshawk surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

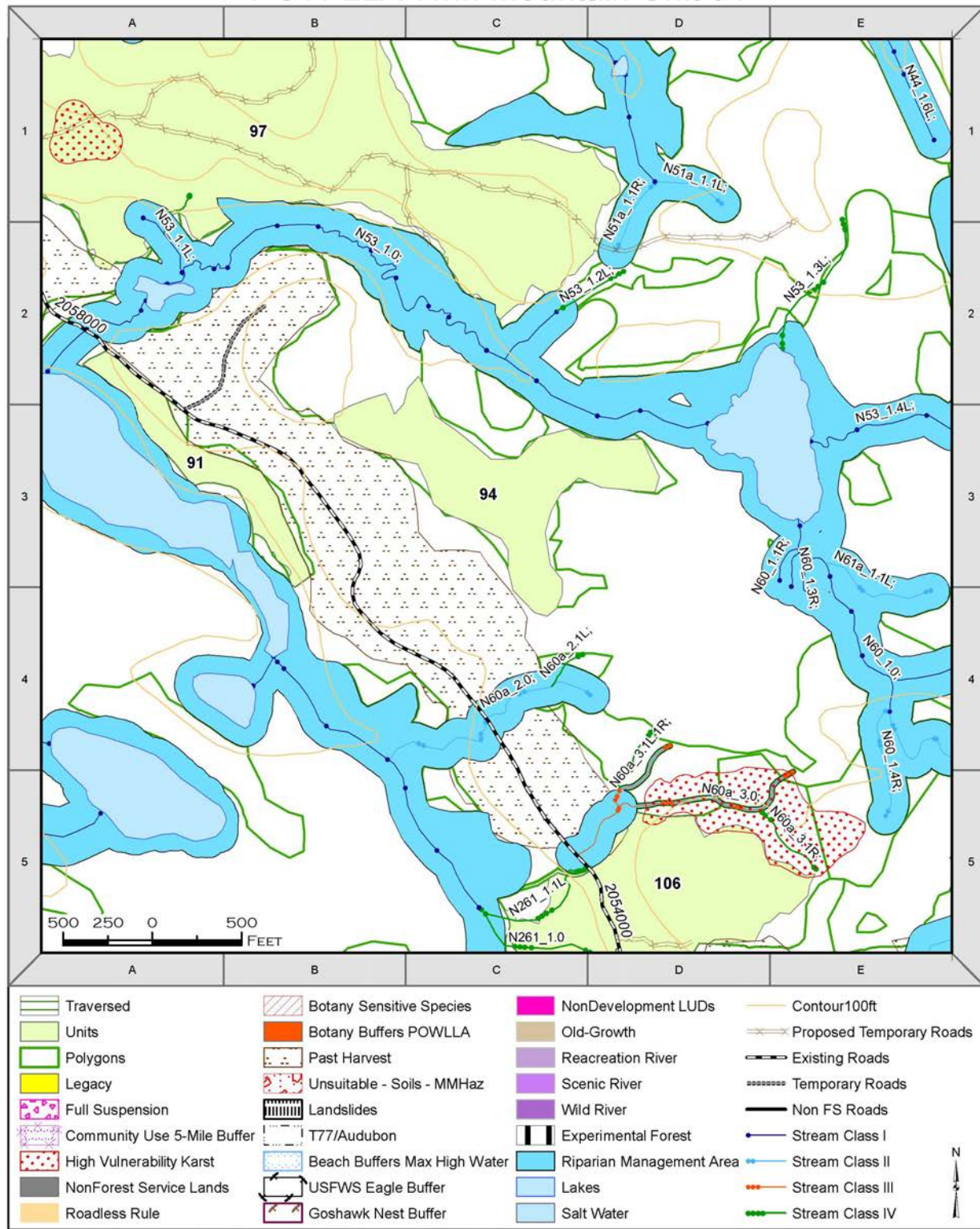
POW LLA Twin Mountain Unit 91



Unit 91							
Unit Number:	91	Total Harvest Unit Acres	2	Prescription:	UA	Harvest System:	Shovel
VCU Number:	5710	LUD:	Timber Production		Net Harvest Volume (MBF):		25
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 were not noted in the overstory. The risk for windthrow in this stand is moderate due to its exposure to winds coming off nearby lakes and adjacent past harvest, and due to existing stand and site characteristics. Old-growth stands tend to already exhibit uneven-aged structure to varying degrees. Uneven-aged management should be designed to create (young growth) or maintain (old growth) multi-aged or multi-layered stand structure. Harvests must be designed so that future entries are not physically or economically isolated and so that tree regeneration is not excessively damaged. Harvests should maintain three or more distinct age classes in a reasonably well dispersed manner across the stand. Harvest openings must also be of sufficient size to allow regeneration of all species. Allow the intermediate age class to develop into mature trees and provide for another economical harvest. This unit has old-growth structure and is located within 5 miles of a subsistence community. Uneven-aged management is required. Group selections will be up to 2 acres in size, between one tree length apart (120 feet) to 200 feet apart in moderate windthrow risk areas or 300 feet apart in high windthrow risk areas and should harvest no more than approximately 33 percent of the stand during any cutting cycle. Harvest openings should be located to balance wildlife needs or meet other objectives (manage windthrow and/or allow for RAW) while creating an economical sale opportunity. Openings must be planned so that opportunities for the next harvest entry are not negatively impacted. This unit lies within a legacy VCU. However, due to harvest constraints within the 5 mile community buffer, the maximum opening size of 2 acres will not trigger a need for legacy retention.							
TIMBER/LOGGING							
This unit is planned for shovel yarding to landings located along NFSR 2058000.							
ENGINEERING/SYSTEM ROADS							
Access via existing NFS road 2058000 (BMP 14.20, Road-4, Road-7).							
BOTANY							
Surveys have not been completed but will be required due to identified potential habitat for sensitive/rare plants within/near this unit. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.							
INVASIVE SPECIES							
Weeds are in the area of the unit along NFSR 2058000. 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 POWLLA EIS 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.: 53_1.0 Stream Class: I Channel Type: MMS, HCM Protection: Category A Flagging: B/W Buffer (RMA) Yes Concerns: Class I for MMS: 120 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.							
Stream Num.: Map Location C-3 Stream Class: I							

Unit 91	
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
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 are 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	
Surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.	
RECREATION	
No recreation concerns, as proposed, as of 09 July 2019.	
SOILS/WETLANDS	
Slopes are less than 55% with knobs present. 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	
June goshawk surveys have been completed. July/August goshawk surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.	

POW LLA Twin Mountain Unit 94



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Unit 94						
Unit Number:	94	Total Harvest Unit Acres	6	Prescription:	UA	Harvest System: Shovel
VCU Number:	5710	LUD:	Timber Production	Net Harvest Volume (MBF):		120
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 were not noted in the overstory although some insect damage has been noted. The risk for windthrow in this stand is low. Old-growth stands tend to already exhibit uneven-aged structure to varying degrees. Uneven-aged management should be designed to create (young growth) or maintain (old growth) multi-aged or multi-layered stand structure. Harvests must be designed so that future entries are not physically or economically isolated and so that tree regeneration is not excessively damaged. Harvests should maintain three or more distinct age classes in a reasonably well dispersed manner across the stand. Harvest openings must also be of sufficient size to allow regeneration of all species. Allow the intermediate age class to develop into mature trees and provide for another economical harvest. This unit has old-growth structure and is located within 5 miles of a subsistence community. Uneven-aged management is required. Group selections will be up to 2 acres in size, between one tree length apart (120 feet) to 200 feet apart in moderate windthrow risk areas or 300 feet apart in high windthrow risk areas and should harvest no more than approximately 33 percent of the stand during any cutting cycle. Harvest openings should be located to balance wildlife needs or meet other objectives (manage windthrow and/or allow for RAW) while creating an economical sale opportunity. Openings must be planned so that opportunities for the next harvest entry are not negatively impacted. This unit lies within a legacy VCU. However, due to harvest constraints within the 5 mile community buffer, the maximum opening size of 2 acres will not trigger a need for legacy retention.						
TIMBER/LOGGING						
This unit is planned for shovel yarding to landings located along a proposed temporary road off of NFSR 2058000.						
ENGINEERING/SYSTEM ROADS						
Access via existing NFS road 2058000 (BMP 14.20, Road-4, Road-7). New temporary road construction, 0.18 miles (BMPs 14.5, Road-3, Road-5, Road-6, Road-7).						
BOTANY						
Unit has not been surveyed due to time constraints. Unit has low probability of having sensitive plants. Unless surveys are conducted to confirm, activities may impact sensitive or rare plant individuals.						
INVASIVE SPECIES						
Weeds are in the area of the unit along NFSR 2058000. 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 POWLLA EIS 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.:	53_1.0					
Stream Class:	I					
Channel Type:	PAB, LCS					
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. 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					
All Streams Protection/Mitigation Actions by Category:						

Unit 94

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 road/stream crossings are anticipated. 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 as proposed as of 6/28/19.

RECREATION

No recreation concerns, as proposed, as of 09 July 2019.

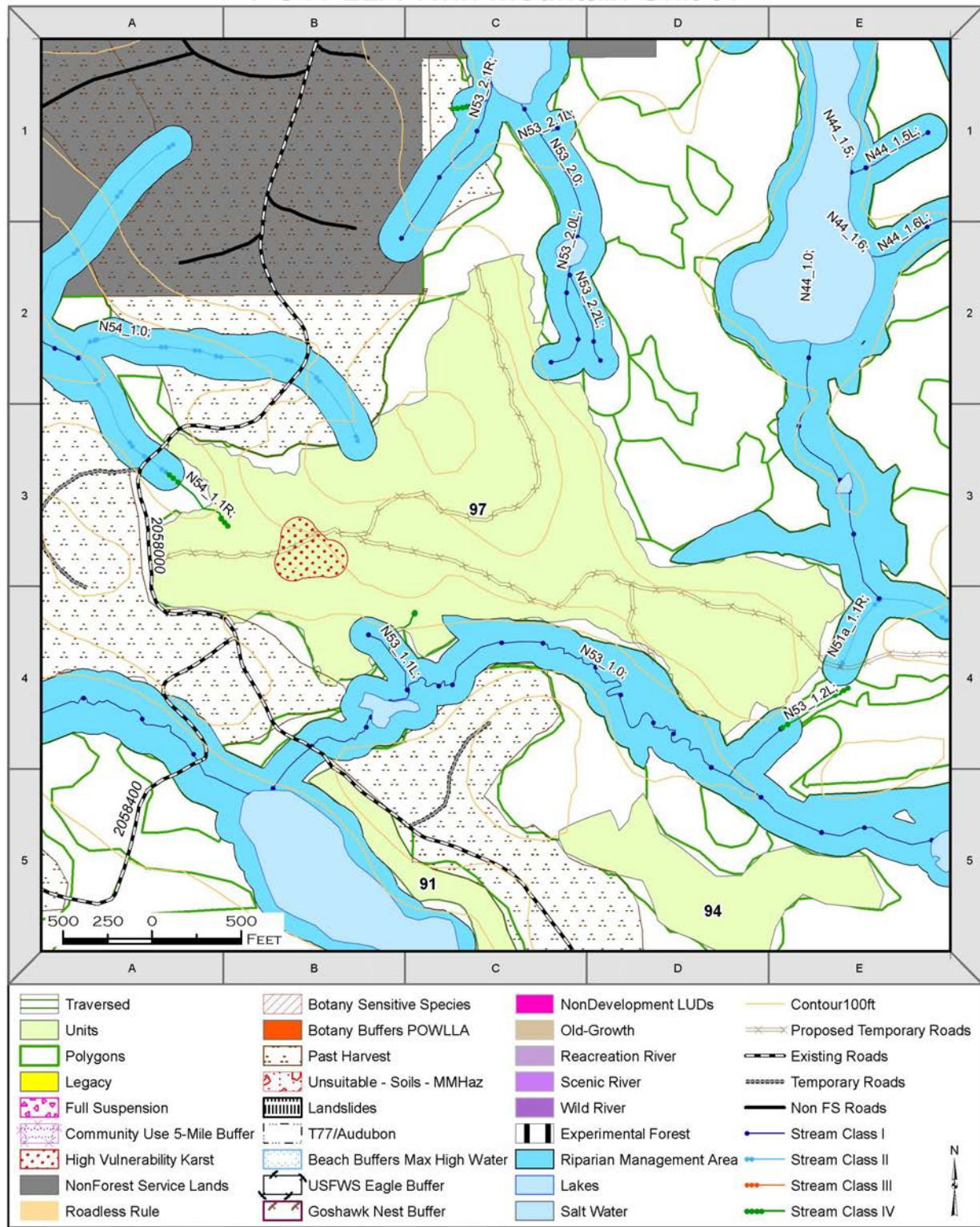
SOILS/WETLANDS

Slopes are less than 55% with cliff band present. 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 intermittent throughout the unit (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4). The temporary road location will be reviewed prior to implementation. Follow R10 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.

WILDLIFE

Surveys have been completed. No goshawks detected. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 97



Unit 97							
Unit Number:	97	Total Harvest Unit Acres	20	Prescription:	UA	Harvest System:	Cable
VCU Number:	5710	LUD:	Timber Production		Net Harvest Volume (MBF):		200
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 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 southerly winds coming off adjacent muskegs and past harvest, and due to existing stand and site characteristics. Old-growth stands tend to already exhibit uneven-aged structure to varying degrees. Uneven-aged management should be designed to create (young growth) or maintain (old growth) multi-aged or multi-layered stand structure. Harvests must be designed so that future entries are not physically or economically isolated and so that tree regeneration is not excessively damaged. Harvests should maintain three or more distinct age classes in a reasonably well dispersed manner across the stand. Harvest openings must also be of sufficient size to allow regeneration of all species. Allow the intermediate age class to develop into mature trees and provide for another economical harvest. This unit has old-growth structure and is located within 5 miles of a subsistence community. Uneven-aged management is required. Group selections will be up to 2 acres in size, between one tree length apart (120 feet) to 200 feet apart in moderate windthrow risk areas or 300 feet apart in high windthrow risk areas and should harvest no more than approximately 33 percent of the stand during any cutting cycle. Harvest openings should be located to balance wildlife needs or meet other objectives (manage windthrow and/or allow for RAW) while creating an economical sale opportunity. Openings must be planned so that opportunities for the next harvest entry are not negatively impacted. This unit lies within a legacy VCU. However, due to harvest constraints within the 5 mile community buffer, the maximum opening size of 2 acres will not trigger a need for legacy retention.							
TIMBER/LOGGING							
Preliminary timber survey walk-through has been completed. Other required surveys have not been completed. Unit will be refined after Out-year Plan comment period and all surveys have been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.							
ENGINEERING/SYSTEM ROADS							
Access via existing NFS road 2058000 (BMP 14.20, Road-4, Road-7). New temporary road construction, 1.10 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 2058000. 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 POWLLA EIS 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.:	53_1.0						
Stream Class:	I						
Channel Type:	MMS, HCM, MMS, PAS, MCS, 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 HCM: 100 feet or to the top of the side-slope break; whichever is greater. 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. Class I for MCS: 100 feet or to the top of the side-						

Unit 97

slope break, whichever is greater. Class I 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.: 53_1.1L

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: N/A

Stream Num.: 53_1.1L.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.: 53_1.2L

Stream Class: I, IV

Channel Type: PAB, PAO

Protection: Category A, C

Flagging: B/W, G/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; Class IV for PAO: No buffer

Concerns: N/A

Stream Num.: 53_2.0

Stream Class: I

Channel Type: PAB, PAO, HCO

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. 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 HCO: 100 feet or to the top of the side-slope break; whichever is greater.

Concerns: N/A

Stream Num.: 53_2.2L

Stream Class: I

Channel Type: PAO, HCO

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 HCO: 100 feet or to the top of the side-slope break, whichever is greater.

Concerns: N/A

Stream Num.: MS241_203

Stream Class: I, IV

Channel Type: MMO, PAO

Protection: Category A, 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 PAO: No buffer.

Concerns: N/A

All Streams Protection/Mitigation Actions by Category:

All Categories implement BMPs

Unit 97

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 road/stream crossings are 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 karst, the karst was determined to be of low to moderate vulnerability with inclusions of high vulnerability surrounding discrete karst features. No harvest buffers have been flagged surrounding these 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 as proposed as of 6/28/19.

RECREATION

No recreation concerns, as proposed, as of 09 July 2019.

SOILS/WETLANDS

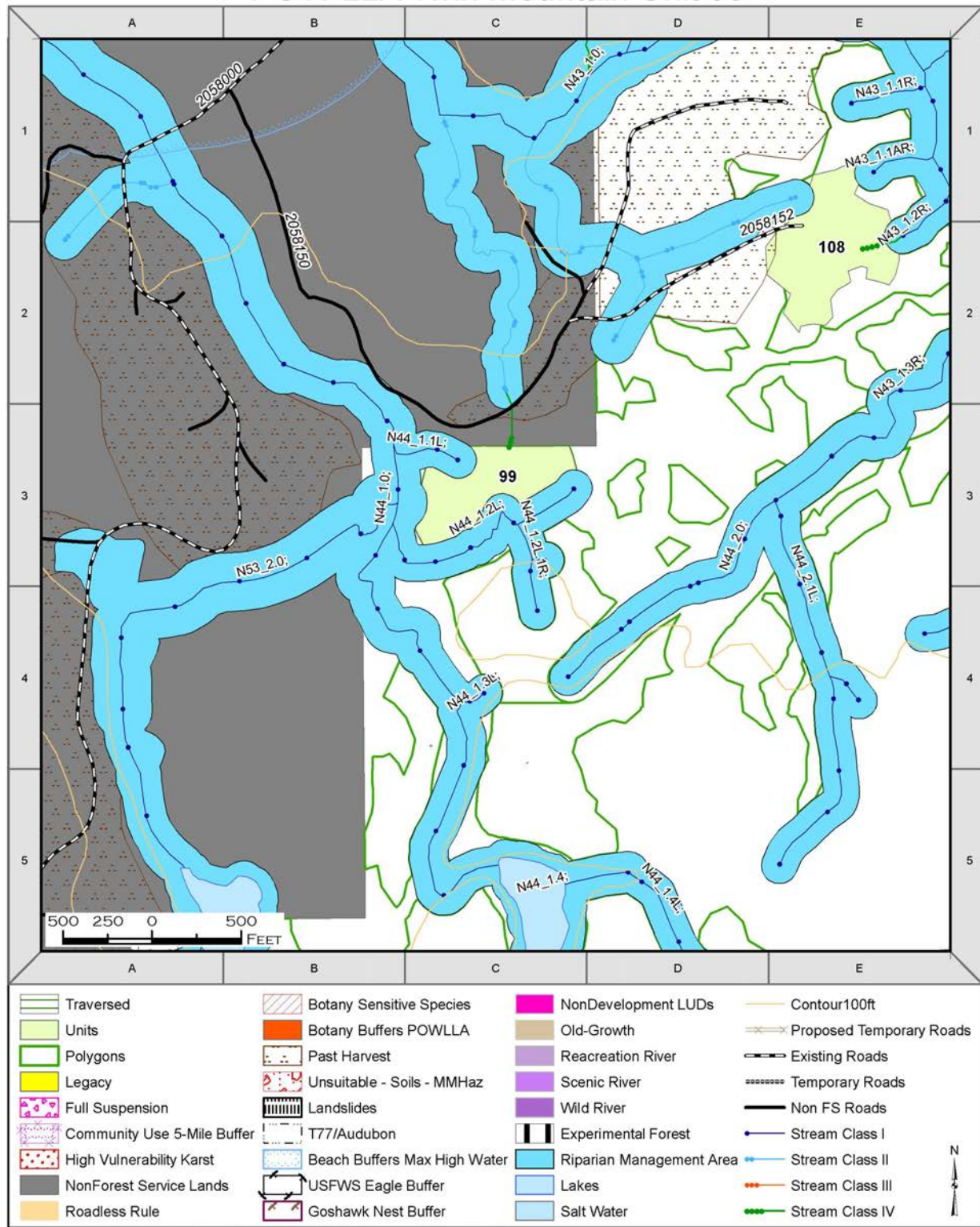
Slopes are gentle up to 70% on knobs with bands of 55% slope surrounding the unit. The soils and wetlands are suitable for a minimum of partial suspension cable yarding and shovel yarding (R10 BMPS 12.5, 13.5, and 13.9 and National Core BMPs Plan-2, AqEco-2, AqEco-4, Veg-1, Veg-2, Veg-5, and Veg-6). 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). 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

Surveys have been completed. No goshawks detected. Marbled murrelet activity in unit. Follow up surveys will be completed in 2019 to determine sub canopy behavior. A 600 foot buffer may be required.

All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 99



Unit 99							
Unit Number:	99	Total Harvest Unit Acres	2	Prescription:	UA	Harvest System:	Shovel, Cable
VCU Number:	5710	LUD:	Timber Production		Net Harvest Volume (MBF):		25
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 to 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 moderate due to its exposure to southerly winds coming off adjacent muskegs and nearby lakes, and due to existing stand and site characteristics. Old-growth stands tend to already exhibit uneven-aged structure to varying degrees. Uneven-aged management should be designed to create (young growth) or maintain (old growth) multi-aged or multi-layered stand structure. Harvests must be designed so that future entries are not physically or economically isolated and so that tree regeneration is not excessively damaged. Harvests should maintain three or more distinct age classes in a reasonably well dispersed manner across the stand. Harvest openings must also be of sufficient size to allow regeneration of all species. Allow the intermediate age class to develop into mature trees and provide for another economical harvest. This unit has old-growth structure and is located within 5 miles of a subsistence community. Uneven-aged management is required. Group selections will be up to 2 acres in size, between one tree length apart (120 feet) to 200 feet apart in moderate windthrow risk areas or 300 feet apart in high windthrow risk areas and should harvest no more than approximately 33 percent of the stand during any cutting cycle. Harvest openings should be located to balance wildlife needs or meet other objectives (manage windthrow and/or allow for RAW) while creating an economical sale opportunity. Openings must be planned so that opportunities for the next harvest entry are not negatively impacted. This unit lies within a legacy VCU. However, due to harvest constraints within the 5 mile community buffer, the maximum opening size of 2 acres will not trigger a need for legacy retention.							
TIMBER/LOGGING							
This unit is planned for a combination of shovel and cable yarding to landings located along a proposed temporary road with spurs off of 2058000.							
ENGINEERING/SYSTEM ROADS							
Access via existing State road 2058000.							
BOTANY							
No botany concerns.							
INVASIVE SPECIES							
Weeds are in the area of the unit along NFSR 2058000 and 2058150. 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 POWLLA EIS 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.:	44_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.						
Concerns:	N/A						
Stream Num.:	44_1.1L						
Stream Class:	I						
Channel Type:	HCO, MMO						

Unit 99

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. 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: N/A

Stream Num.: 44_1.2L
 Stream Class: I
 Channel Type: HCO, FPO
 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. 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.
 Concerns: N/A

Stream Num.: 44_1.0
 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

No temporary road/stream crossings are anticipated. 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 as proposed as of 6/28/19.

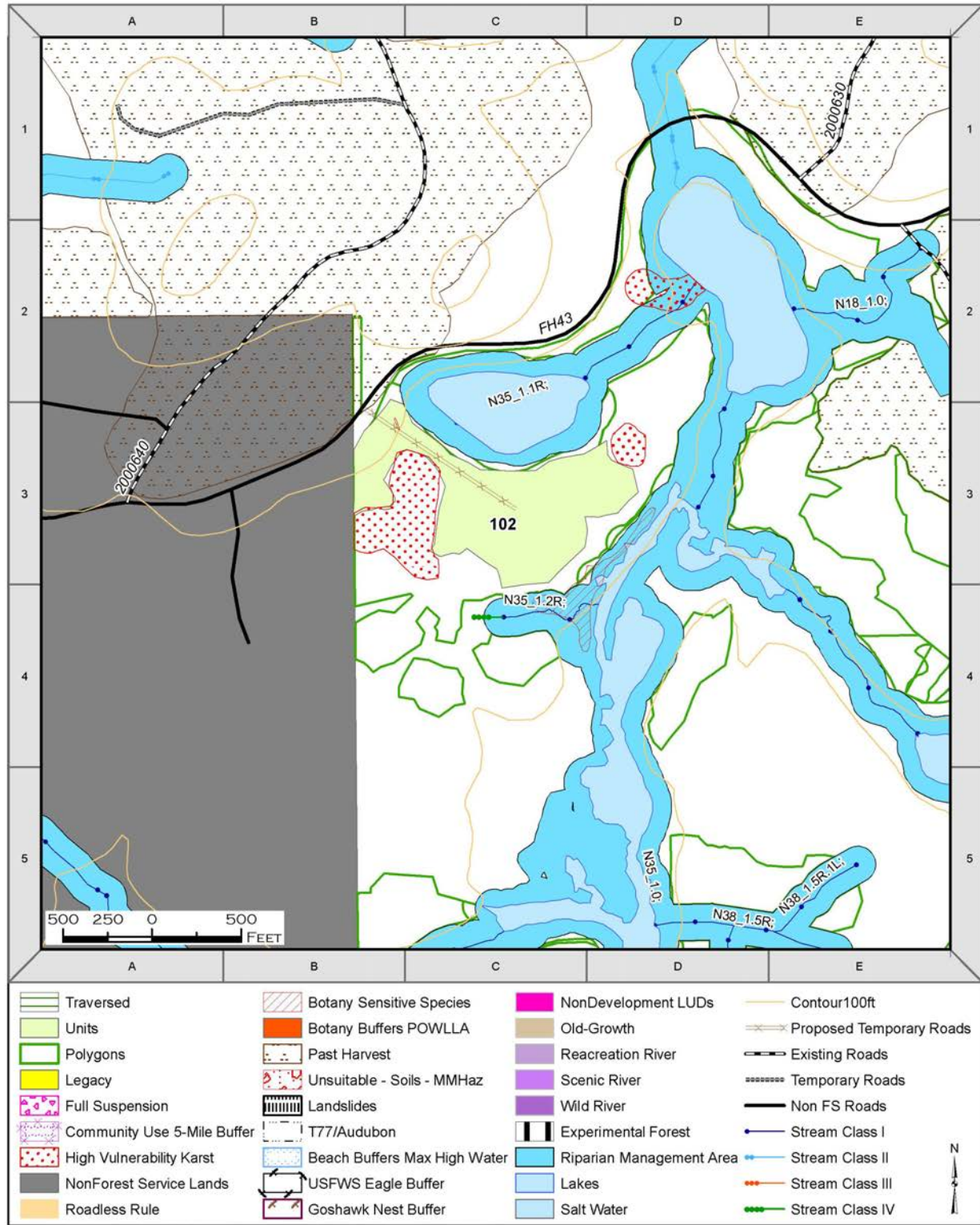
RECREATION

No recreation concerns, as proposed, as of 09 July 2019.

SOILS/WETLANDS

Unit 99
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). Proposed temporary road locations will be reviewed prior to implementation. Follow R10 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
June goshawk survey have been completed. July/August goshawk surveys have not been completed. All resource-specific information, surveys, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 102



Unit 102						
Unit Number:	102	Total Harvest Unit Acres	4	Prescription:	UA	Harvest System: Shovel
VCU Number:	5710	LUD:	Timber Production	Net Harvest Volume (MBF):		80
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 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 winds coming off nearby lakes and adjacent past harvest, and due to existing stand and site characteristics. Old-growth stands tend to already exhibit uneven-aged structure to varying degrees. Uneven-aged management should be designed to create (young growth) or maintain (old growth) multi-aged or multi-layered stand structure. Harvests must be designed so that future entries are not physically or economically isolated and so that tree regeneration is not excessively damaged. Harvests should maintain three or more distinct age classes in a reasonably well dispersed manner across the stand. Harvest openings must also be of sufficient size to allow regeneration of all species. Allow the intermediate age class to develop into mature trees and provide for another economical harvest. This unit has old-growth structure and is located within 5 miles of a subsistence community. Uneven-aged management is required. Group selections will be up to 2 acres in size, between one tree length apart (120 feet) to 200 feet apart in moderate windthrow risk areas or 300 feet apart in high windthrow risk areas and should harvest no more than approximately 33 percent of the stand during any cutting cycle. Harvest openings should be located to balance wildlife needs or meet other objectives (manage windthrow and/or allow for RAW) while creating an economical sale opportunity. Openings must be planned so that opportunities for the next harvest entry are not negatively impacted. This unit lies within a legacy VCU. However, due to harvest constraints within the 5 mile community buffer, the maximum opening size of 2 acres will not trigger a need for legacy retention.						
TIMBER/LOGGING						
This unit is planned for shovel yarding to landings located along a proposed temporary road off of SH FH43.						
ENGINEERING/SYSTEM ROADS						
Access via State Highway 43 and new temporary road construction (BMPs 14.5, Road-3, Road-5, Road-6).						
BOTANY						
While surveys have been completed, the GIS layer has not yet been updated to reflect survey findings.						
This unit has two plants of <i>Platanthera orbiculata</i> (lesser round-leaved orchid), which do not make up a viable population. No flowers were found. Therefore, the plants will be contributing little to the genetic diversity of the population on POW at this time. Buffers are not recommended. This unit is adjacent to a population of <i>Physocarpus capitatus</i> (Pacific ninebark), which is an S3 plant and considered rare in the state. However, it is not rare on POW. This plant is also in a riparian buffer outside but near the unit and will not be impacted due to project activities. Additional buffers are not recommended.						
INVASIVE SPECIES						
Weeds are in the area of the unit along State Highway 43. 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 POWLLA EIS 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.:	236_1.0					
Stream Class:	I					
Channel Type:	PAM					
Protection:	Category A					
Flagging:	B/W					

Unit 102

Buffer (RMA):

Class I for PAM: 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.: 236_1.1R

Stream Class: I

Channel Type: PAM, PAS

Protection: Category A

Flagging: B/W

Buffer (RMA):

Class I for PAM: 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 PAS: 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.: 236_1.1R.1L

Stream Class: I

Channel Type: PAS

Protection: Category A

Flagging: B/W

Buffer (RMA):

Class I for PAS: 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

No temporary road/stream crossings are anticipated. 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. 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. Three no harvest buffers have been flagged surrounding these karst features. Final unit layout excludes high vulnerability karst resources.

HERITAGE RESOURCES

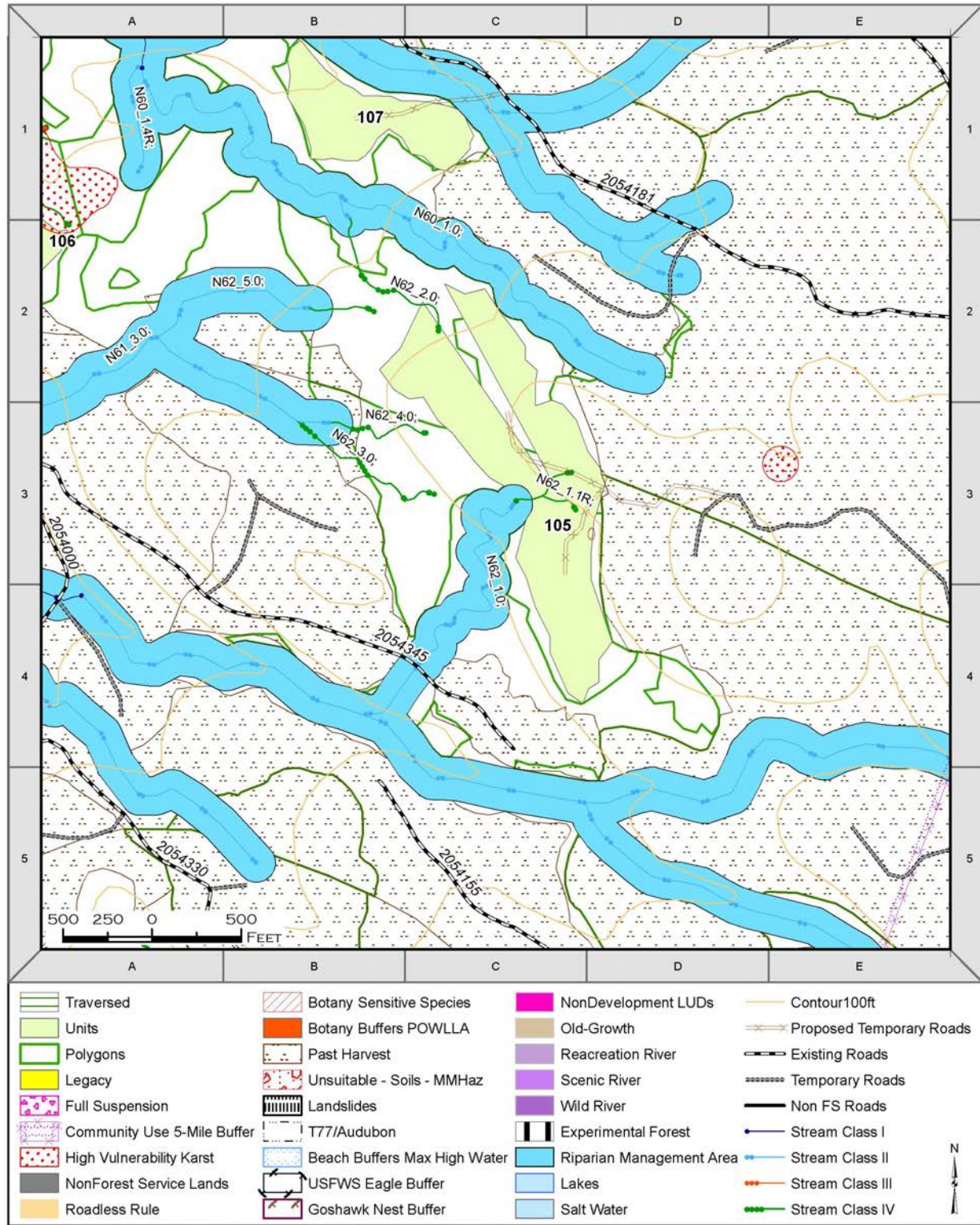
A finding of "No historic properties affected" (36 CFR 800.4(d)(1) or "No adverse effect" (36 CFR 800.5(d)(1) has been applied. Project activities may proceed as planned; however the Heritage Professional shall be consulted if new discoveries or unanticipated effects are identified during the project's 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 as proposed as of 6/28/19.

Unit 102
RECREATION
No recreation concerns, as proposed, as of 09 July 2019.
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 BMP 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). Forested wetlands/emergent short sedge are located in the northern boundary of the unit near the lake (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4). The proposed temporary road traverses about ½ acre of forested wetland/ emergent short sedge within the unit. Wetland avoidance was not feasible due to the location of the existing road 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
Surveys have been completed. No goshawks detected. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 105



Unit 105							
Unit Number:	105	Total Harvest Unit Acres	6	Prescription:	UA	Harvest System:	Shovel, Cable
VCU Number:	5871	LUD:	Timber Production		Net Harvest Volume (MBF):		129
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 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 southerly winds coming off adjacent past harvest, and due to existing stand and site characteristics. Old-growth stands tend to already exhibit uneven-aged structure to varying degrees. Uneven-aged management should be designed to create (young growth) or maintain (old growth) multi-aged or multi-layered stand structure. Harvests must be designed so that future entries are not physically or economically isolated and so that tree regeneration is not excessively damaged. Harvests should maintain three or more distinct age classes in a reasonably well dispersed manner across the stand. Harvest openings must also be of sufficient size to allow regeneration of all species. Allow the intermediate age class to develop into mature trees and provide for another economical harvest. This unit has old-growth structure and is located within 5 miles of a subsistence community. Uneven-aged management is required. Group selections will be up to 2 acres in size, between one tree length apart (120 feet) to 200 feet apart in moderate windthrow risk areas or 300 feet apart in high windthrow risk areas and should harvest no more than approximately 33 percent of the stand during any cutting cycle. Harvest openings should be located to balance wildlife needs or meet other objectives (manage windthrow and/or allow for RAW) while creating an economical sale opportunity. Openings must be planned so that opportunities for the next harvest entry are not negatively impacted. This unit lies within a legacy VCU. However, due to harvest constraints within the 5 mile community buffer, the maximum opening size of 2 acres will not trigger a need for legacy retention.							
TIMBER/LOGGING							
This unit is planned for a combination of shovel and uphill yarding to landings located along a proposed temporary road with spurs off of NFSR 2054100.							
ENGINEERING/SYSTEM ROADS							
Access via existing NFS road 2054100 (BMP 14.20, Road-4, Road-6). New temporary road on existing prism 0.43 miles. (BMPs 14.5, Road-3, Road-6). New temporary road construction, 0.36 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 closed NFSR road 2054345. 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 POWLLA EIS 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.:	60_1.0						
Stream Class:	II						
Channel Type:	PAB, MMO						
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.							
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.							

Unit 105

Concerns: N/A

Stream Num.: 62_1.0

Stream Class: II, IV

Channel Type: HCL, PAO, 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 PAO: 100 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.: 62_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.: 62_2.0

Stream Class: IV

Channel Type: PAO, HCO

Protection: Category C

Flagging: G/W

Buffer (RMA):

Class IV for PAO: No buffer

Class IV for HCO: No buffer

Concerns: N/A

Stream Num.: 62_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.: 62_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.: 62_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

Unit 105

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 Class IV road/stream crossing is 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 eastern portion of the unit is underlain by moderate vulnerability karst, a logging system that achieves partial suspension 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 as proposed as of 6/28/19.

RECREATION

No recreation concerns, as proposed, as of 09 July 2019.

SOILS/WETLANDS

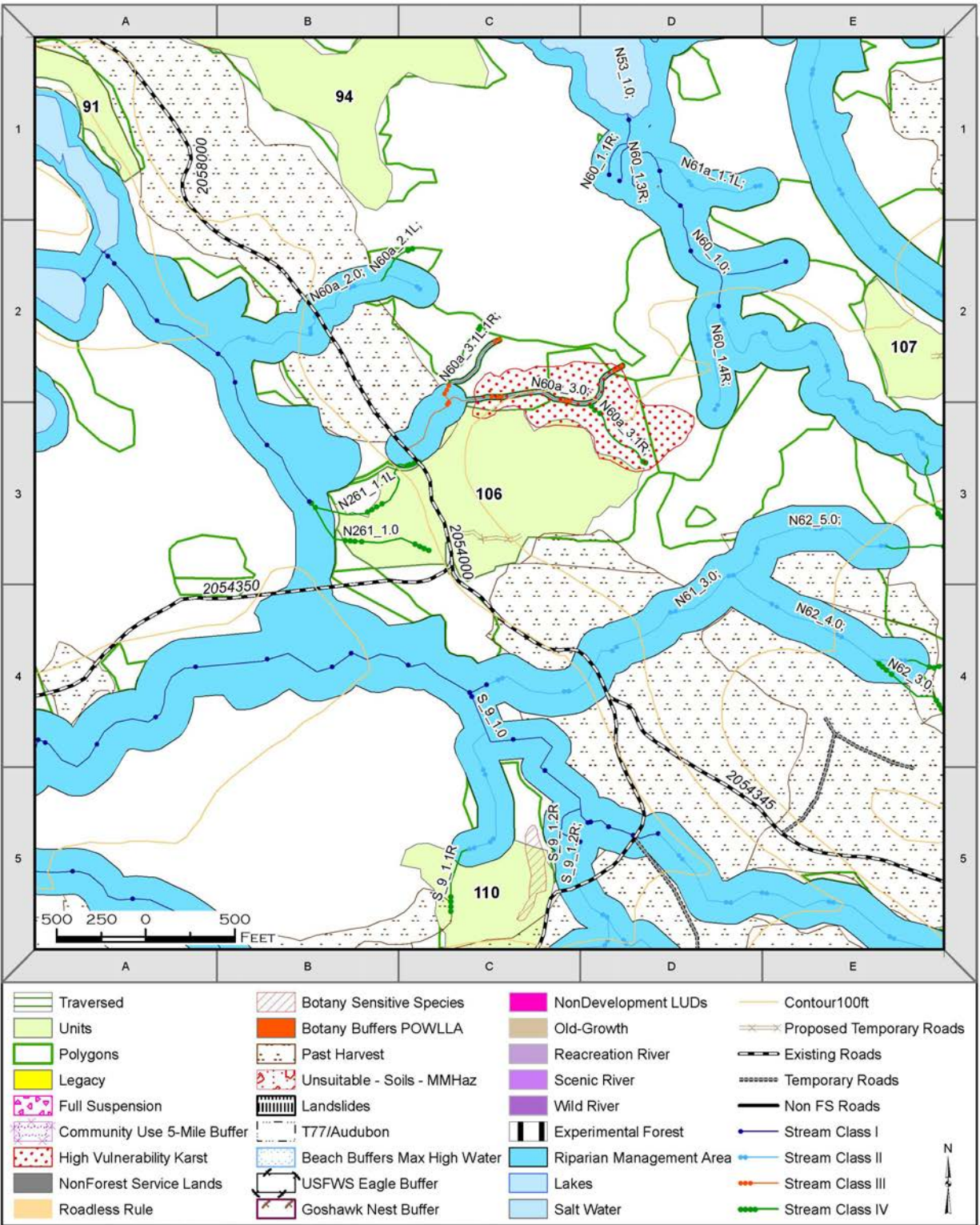
Slopes are less than 55% with many knobs throughout the unit. The soils and wetlands are suitable for shovel yarding and partial suspension cable yarding (R10 BMPs 12.5, 13.5, and 13.9 and National Core BMPs Plan-2, AqEco-2, AqEco-4, Veg-1, Veg-2, Veg-5, and Veg-6). Follow shovel yarding guidelines outlined 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/emergent short sedge are intermixed throughout the unit (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4). The proposed temporary road traverses about 0.5 acres of forested wetlands/emergent short sedge within the unit. Wetland avoidance was not feasible due to the location of the existing road and the abundance of wetland in the western portion of the unit. Follow R10 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.

WILDLIFE

Surveys have been completed. No goshawks detected.

All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 106



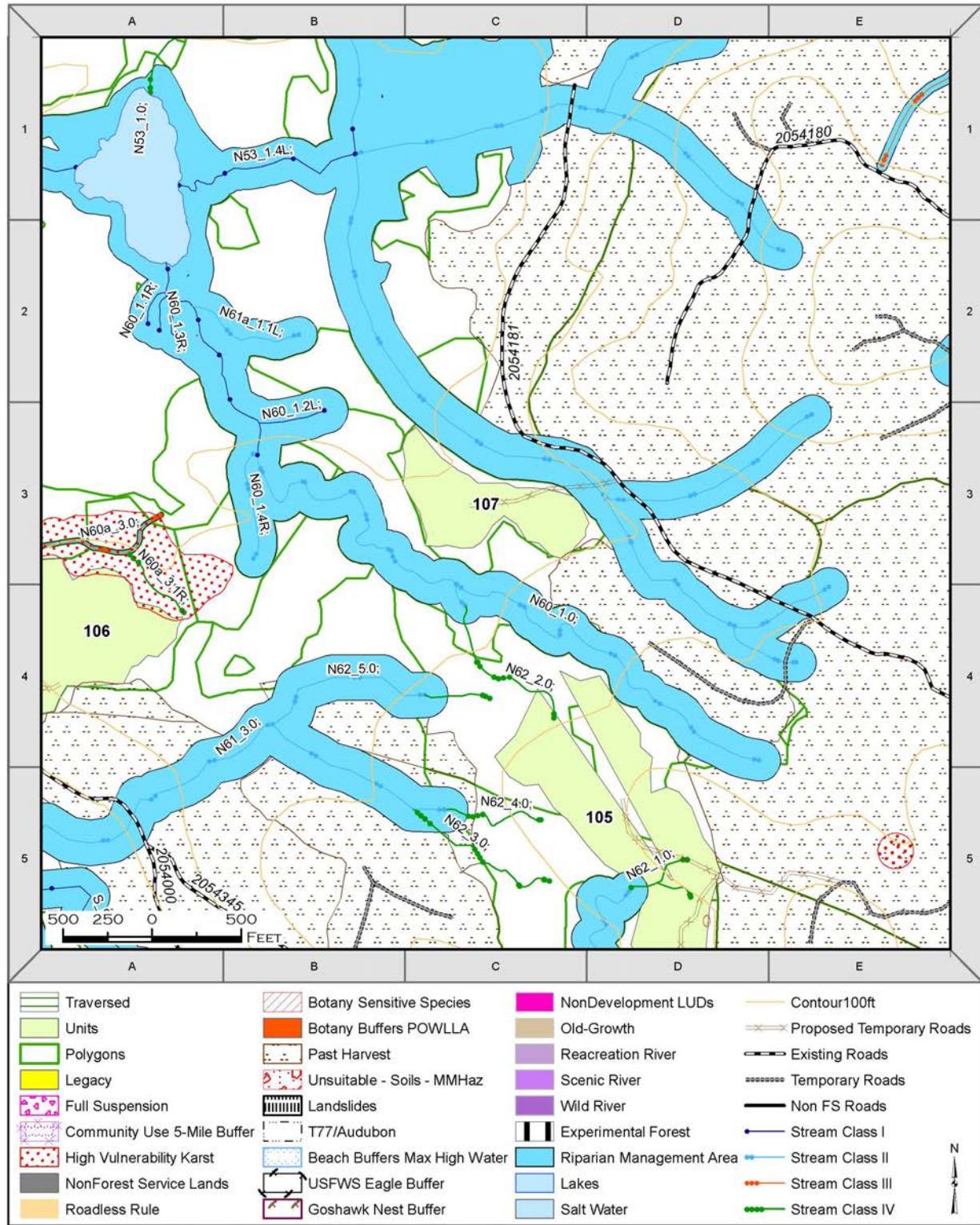
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Unit 106						
Unit Number:	106	Total Harvest Unit Acres	4	Prescription:	UA	Harvest System: Shovel
VCU Number:	5710, 5871	LUD:	Timber Production	Net Harvest Volume (MBF):		80
Summary of Concerns, Responses, BMPs, and Mitigations						
SILVICULTURE						
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. Old-growth stands tend to already exhibit uneven-aged structure to varying degrees. Uneven-aged management should be designed to create (young growth) or maintain (old growth) multi-aged or multi-layered stand structure. Harvests must be designed so that future entries are not physically or economically isolated and so that tree regeneration is not excessively damaged. Harvests should maintain three or more distinct age classes in a reasonably well dispersed manner across the stand. Harvest openings must also be of sufficient size to allow regeneration of all species. Allow the intermediate age class to develop into mature trees and provide for another economical harvest. This unit has old-growth structure and is located within 5 miles of a subsistence community. Uneven-aged management is required. Group selections will be up to 2 acres in size, between one tree length apart (120 feet) to 200 feet apart in moderate windthrow risk areas or 300 feet apart in high windthrow risk areas and should harvest no more than approximately 33 percent of the stand during any cutting cycle. Harvest openings should be located to balance wildlife needs or meet other objectives (manage windthrow and/or allow for RAW) while creating an economical sale opportunity. Openings must be planned so that opportunities for the next harvest entry are not negatively impacted. This unit lies within a legacy VCU. However, due to harvest constraints within the 5 mile community buffer, the maximum opening size of 2 acres will not trigger a need for legacy retention.						
TIMBER/LOGGING						
This unit is planned for shovel yarding to landings located along a proposed temporary road and off of NFSR 2054000.						
ENGINEERING/SYSTEM ROADS						
Access via existing NFS road 2058000 (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 botany concerns.						
INVASIVE SPECIES						
Weeds are in the area of the unit along NFSR 2054000. 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 POWLLA EIS 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.: 60a_3.0 Stream Class: II, III Channel Type: MMS, MMO Protection: Category A, B Flagging: B/W, O/W Buffer (RMA): Class II for MMS (not currently mapped): 120 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater. Class III 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: Intermittent karst channel						
Stream Num.: 60a_3.1R Stream Class: IV						

Unit 106	
Channel Type:	HCO
Protection:	Category C
Flagging:	G/W
Buffer (RMA):	Class IV for HCO: No Buffer
Concerns:	Karst
Stream Num.:	261_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.:	261_1.1L (Map Location C-3, not currently mapped)
Stream Class:	I, II
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. 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	
No temporary road/stream crossings are anticipated. 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. The eastern two thirds of the unit is underlain by moderate vulnerability karst with an inclusion 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 as proposed as of 6/28/19.	
RECREATION	
No recreation concerns, as proposed, as of 09 July 2019.	
SOILS/WETLANDS	

Unit 106
Slopes are mostly less than 25% with small knobs throughout 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 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
Surveys have been completed. No goshawks detected. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 107



Unit 107						
Unit Number:	107	Total Harvest Unit Acres	2	Prescription:	UA	Harvest System: Shovel
VCU Number:	5710	LUD:	Timber Production	Net Harvest Volume (MBF):		25
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 nearby muskegs and past harvest, and due to existing stand and site characteristics. Old-growth stands tend to already exhibit uneven-aged structure to varying degrees. Uneven-aged management should be designed to create (young growth) or maintain (old growth) multi-aged or multi-layered stand structure. Harvests must be designed so that future entries are not physically or economically isolated and so that tree regeneration is not excessively damaged. Harvests should maintain three or more distinct age classes in a reasonably well dispersed manner across the stand. Harvest openings must also be of sufficient size to allow regeneration of all species. Allow the intermediate age class to develop into mature trees and provide for another economical harvest. This unit has old-growth structure and is located within 5 miles of a subsistence community. Uneven-aged management is required. Group selections will be up to 2 acres in size, between one tree length apart (120 feet) to 200 feet apart in moderate windthrow risk areas or 300 feet apart in high windthrow risk areas and should harvest no more than approximately 33 percent of the stand during any cutting cycle. Harvest openings should be located to balance wildlife needs or meet other objectives (manage windthrow and/or allow for RAW) while creating an economical sale opportunity. Openings must be planned so that opportunities for the next harvest entry are not negatively impacted. This unit lies within a legacy VCU. However, due to harvest constraints within the 5 mile community buffer, the maximum opening size of 2 acres will not trigger a need for legacy retention.						
TIMBER/LOGGING						
This unit is planned for shovel yarding to landings located along a proposed temporary road off of NFSR 2054181.						
ENGINEERING/SYSTEM ROADS						
Access via existing NFS road 2054181 (BMP 14.20, Road-4, Road-6). New temporary road construction, 0.13 miles (BMPs 14.5, Road-3, Road-5, Road-6). Temporary fish stream crossing requires approved crossing structure and concurrence with ADF&G. Temporary road to be closed and structures removed immediately after timber harvest is complete. 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.						
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 Activities 13, 19, 23 and 24 in the POWLLA EIS 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.:	60_1.0					
Stream Class:	II					
Channel Type:	MCS, HCO, MMO, PAB					
Protection:	Category A					
Flagging:	B/W					
Buffer (RMA):	Class II for MCS: 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.					

Unit 107

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 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.: 62_2.0

Stream Class: II, IV

Channel Type: PAO, HCO

Protection: Category A and C

Flagging: B/W, G/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 IV for HCO: No Buffer

Concerns: N/A

Stream Num.: 107_2.0

Stream Class: II

Channel Type: MMS, MCS, HCLw

Protection: Category A

Flagging: B/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 MCS: 100 feet or to the top of the side-slope break; whichever is greater.

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

Temporary road is planned to cross Class II Stream Num. 107_2.0. This will require Title 16 concurrence and must meet fish timing requirements for construction. Stream crossing structures will be removed immediately following operations.

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

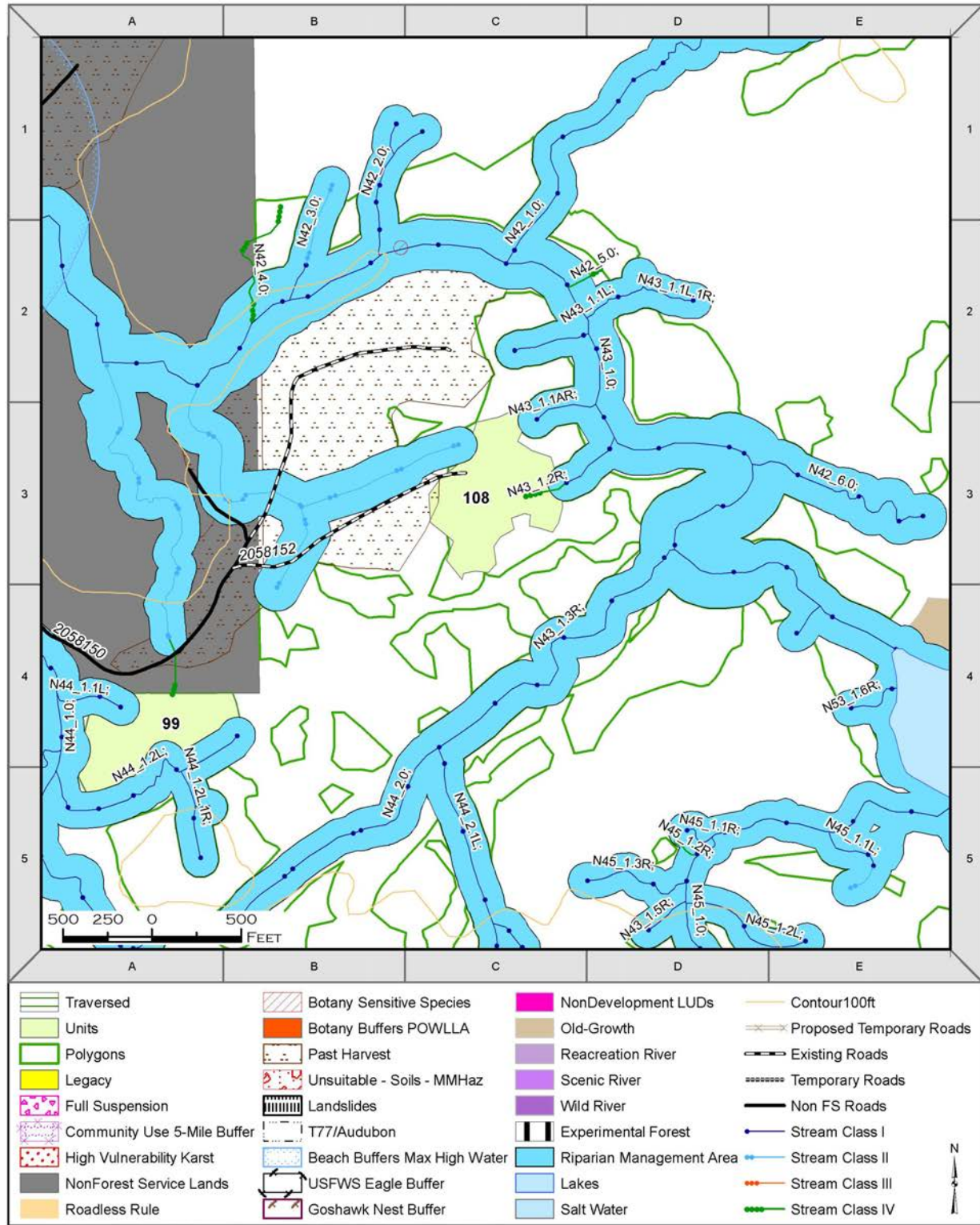
Unit review and surveys have been completed. The unit is not underlain by karst. There are no known karst and cave resource concerns.

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.

Unit 107	
SCENERY	
No scenery concerns as proposed as of 6/28/19.	
RECREATION	
No recreation concerns, as proposed, as of 09 July 2019.	
SOILS/WETLANDS	
Slopes are generally less than 25% with some knobs with slopes 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 BMP 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). Forested wetland/emergent short sedge are present in northern finger of the unit and on the fringes of the southern boundary (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-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	
May/June goshawk surveys have been completed: no detections. July/August goshawk surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.	

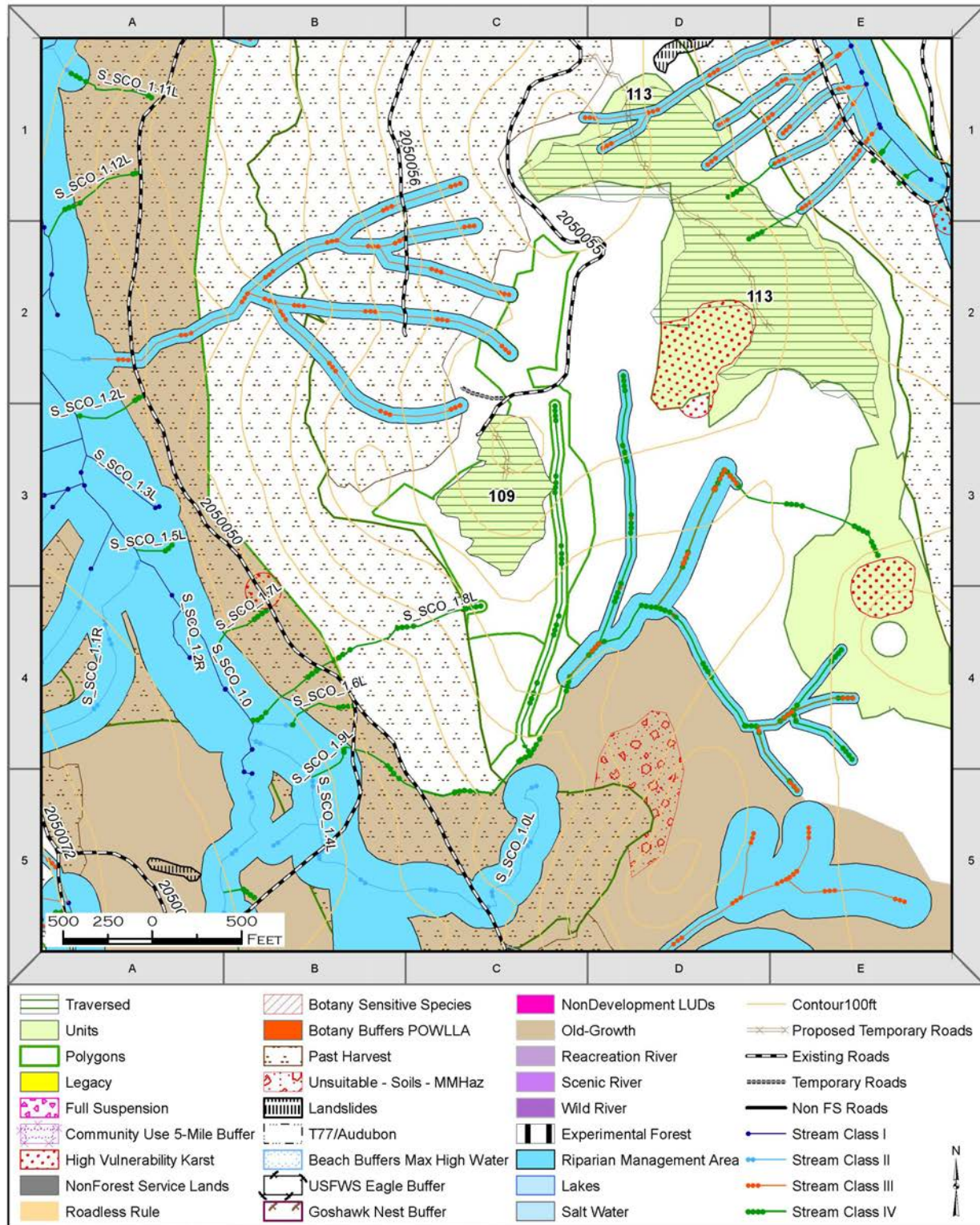
POW LLA Twin Mountain Unit 108



Unit 108							
Unit Number:	108	Total Harvest Unit Acres	2	Prescription:	UA	Harvest System:	Shovel
VCU Number:	5710	LUD:	Timber Production		Net Harvest Volume (MBF):		25
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. This stand is mature with moderate stem decay and defect resulting in a situation where stand growth is being offset by decay. 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 disease and decay throughout, ranging from light to heavy, and has trace levels of insect damage. Mistletoe infections are moderate. The risk for windthrow in this stand is moderate due to heavy exposure to southeasterly winds, existing windthrown trees being thrown from the southeastern direction, and existing stand and site characteristics. Old-growth stands tend to already exhibit uneven-aged structure to varying degrees. Uneven-aged management in old-growth stands should be designed to maintain multi-aged or multi-layered stand structure. Harvests must be designed so that future entries are not physically or economically isolated and so that tree regeneration is not excessively damaged. Harvests should maintain three or more distinct age classes in a reasonably well dispersed manner across the stand. Harvest openings must also be of sufficient size to allow regeneration of all species. Allow the intermediate age class to develop into mature trees and provide for another economical harvest. This unit lies within a 5-mile community buffer and requires the use of uneven-aged management. Group selections should harvest no more than 1/3 of the acres of the unit with no more than 2-acre openings. Harvest openings should be located to balance wildlife needs or meet other objectives (manage windthrow and/or allow for RAW) while creating an economical sale opportunity. Openings must be planned so that opportunities for the next harvest entry are not forfeited. This unit lies within a legacy VCU, but due to constraints from also being within a community buffer, legacy retention is not required.							
TIMBER/LOGGING							
This unit is planned for shovel yarding to landings located along a proposed temporary road off of NFSR 2058152.							
ENGINEERING/SYSTEM ROADS							
Access via existing NFS road 2058152 (BMP 14.20, Road-4, Road-6).							
BOTANY							
Surveys have not been completed but will be required due to identified potential habitat for sensitive/rare plants within/near this unit. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.							
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 Activities 13, 19, 23 and 24 in the POWLLA EIS 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_1.1AR						
Stream Class:	I						
Channel Type:	FPO						
Protection:	Category A						
Flagging:	B/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.						
Concerns:	N/A						
Stream Num.:	43_1.2R						
Stream Class:	I, IV						
Channel Type:	MMO						
Protection:	Category A						

Unit 108	
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 IV for MMO: No buffer
Concerns:	N/A
Stream Num.:	Map Location C3
Stream Class:	II
Channel Type:	PAO
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.
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 road/stream crossings are anticipated. 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 as proposed as of 6/28/19.	
RECREATION	
No recreation concerns, as proposed, as of 09 July 2019.	
SOILS/WETLANDS	
Slopes are mostly less than 25%. There is a small 50ft cliff band on the northern boundary. 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	
Surveys have been completed. No goshawks detected. Marbled murrelet activity noted in unit. Follow up murrelet surveys required to determine sub canopy behavior. 600 foot buffer may be required.	

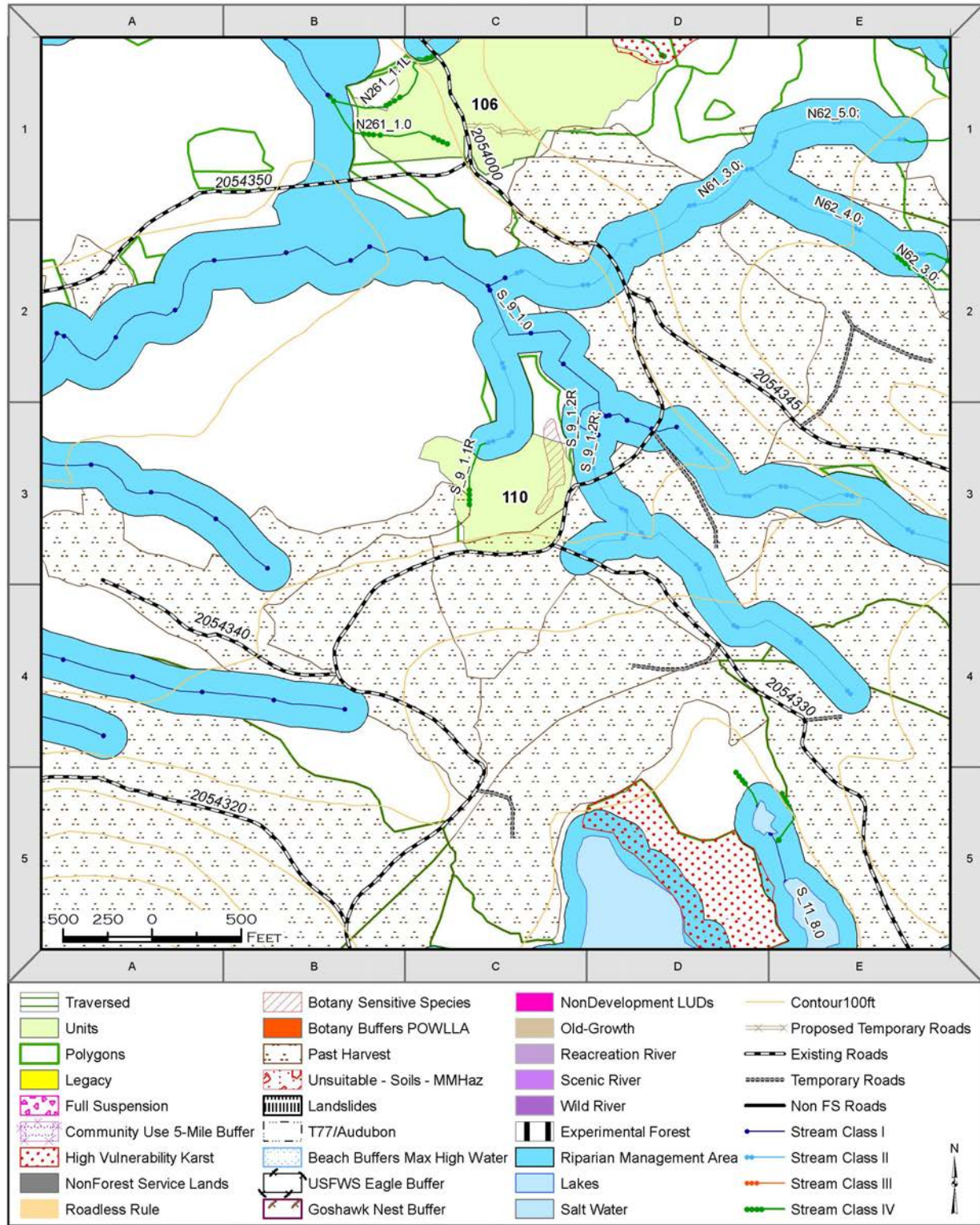
POW LLA Twin Mountain Unit 109



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):		181
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. A RAW review was completed along the Class III stream in the unit, and additional buffering was determined to be unnecessary after field review by a team of specialists. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. However, the planned harvest unit is less than 20 acres in size which eliminates this requirement (Forest Plan, page 4-68).							
TIMBER/LOGGING							
This unit is planned for a combination of shovel and uphill 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							
Unit has not been surveyed due to time constraints. Unit has low probability of having sensitive plants. Unless surveys are conducted to confirm, activities may impact sensitive or rare plant individuals.							
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 Activities 13, 19, 23 and 24 in the POWLLA EIS 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 C3 & B2						
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 109	
Stream Num.:	SCO_1.6L
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.:	SCO_1.8L
Stream Class:	IV
Channel Type:	HCM
Protection:	Category C
Flagging:	G/W
Buffer (RMA):	Class IV for HCM: 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 road/stream crossings are anticipated. 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 as proposed as of 6/28/19.	
RECREATION	
No recreation concerns, as proposed, as of 09 July 2019.	
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	
Surveys have been completed. No goshawks detected. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.	

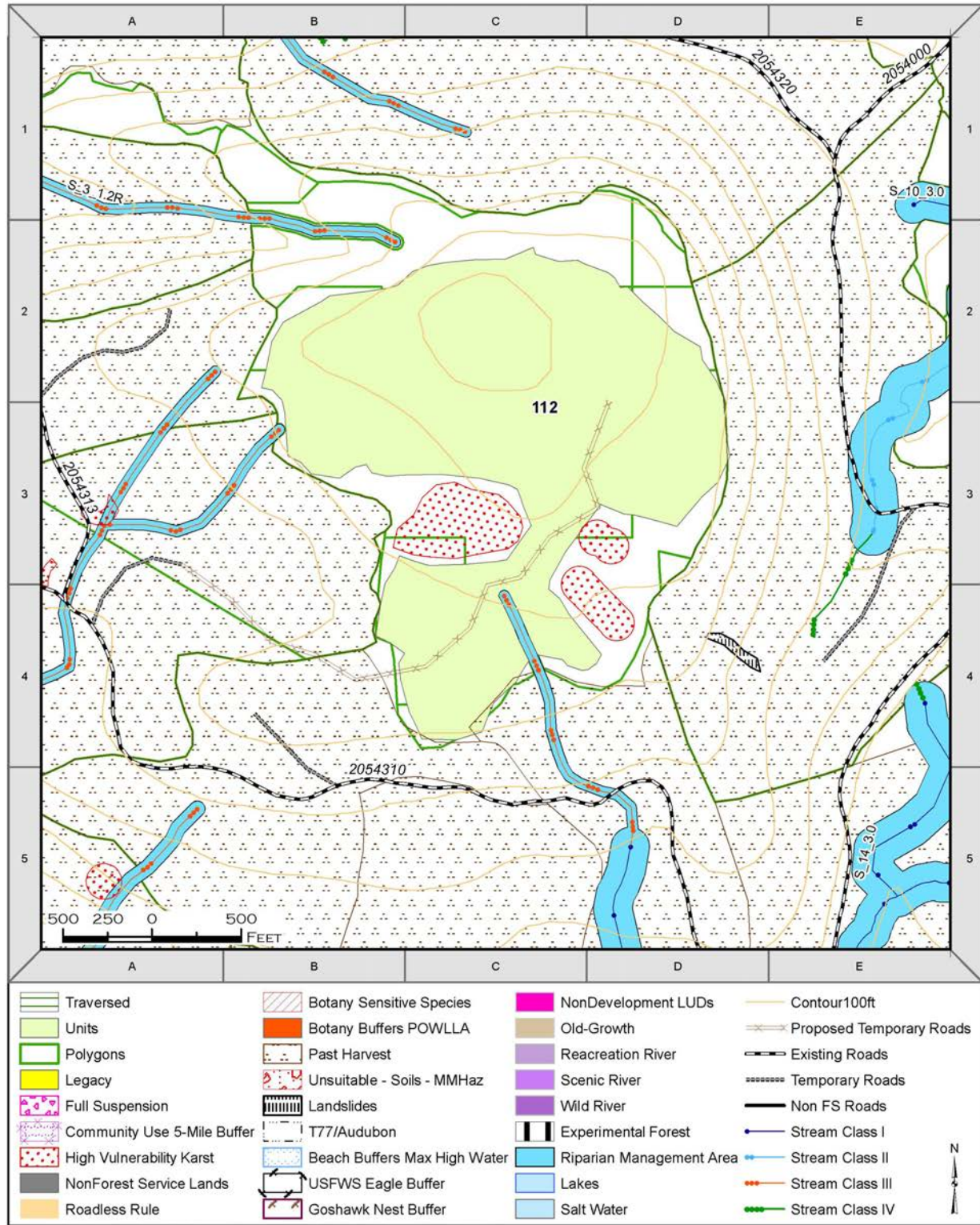
POW LLA Twin Mountain Unit 110



Unit 110						
Unit Number:	110	Total Harvest Unit Acres	2	Prescription:	UA	Harvest System: Shovel
VCU Number:	5871	LUD:	Timber Production	Net Harvest Volume (MBF):		25
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, especially blueberry. This stand has varying levels of disease and decay throughout, typical of old growth stands, ranging from light to heavy. Mistletoe infections are present in the unit at trace levels. The risk for windthrow in this stand is low due to existing stand and site characteristics, despite moderate exposure to the southeast. Old-growth stands tend to already exhibit uneven-aged structure to varying degrees. Uneven-aged management in old-growth stands should be designed to maintain multi-aged or multi-layered stand structure. Harvests must be designed so that future entries are not physically or economically isolated and so that tree regeneration is not excessively damaged. Harvests should maintain three or more distinct age classes in a reasonably well dispersed manner across the stand. Harvest openings must also be of sufficient size to allow regeneration of all species. Allow the intermediate age class to develop into mature trees and provide for another economical harvest. This unit lies within a 5-mile community buffer and requires the use of uneven-aged management. Group selections should harvest no more than 1/3 of the acres of the unit with no more than 2-acre openings. Harvest openings should be located to balance wildlife needs or meet other objectives (manage windthrow and/or allow for RAW) while creating an economical sale opportunity. Openings must be planned so that opportunities for the next harvest entry are not forfeited. This unit is within a legacy VCU, however, legacy retention is not required for group selection harvest.						
TIMBER/LOGGING						
This unit is planned for shovel yarding to landings located off of NFSR 2054000.						
ENGINEERING/SYSTEM ROADS						
Access via existing NFS road 2054000 (BMP 14.20, Road-4, Road-6).						
BOTANY						
No botany concerns.						
INVASIVE SPECIES						
Weeds are in the area of the unit along NFSR 2054000. 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 POWLLA EIS 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.:	9_1.1R					
Stream Class:	II, IV					
Channel Type:	PAO, MMO					
Protection:	Category A, C					
Flagging:	B/W, G/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 IV for MMO: No Buffer					
Concerns:	N/A					
Stream Num.:	9_1.2R					
Stream Class:	I, II					
Channel Type:	MMO, MCO, HCL					
Protection:	Category A					
Flagging:	B/W					

Unit 110	
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 MCO: 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
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 road/stream crossings are anticipated. 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. The southern two thirds unit underlain by low vulnerability karst. No significant karst features were found in the unit. No special mitigation 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 as proposed as of 6/28/19.	
RECREATION	
No recreation concerns, as proposed, as of 09 July 2019.	
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). Forested wetlands/emergent short sedges are intermixed throughout the unit (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4).	
WILDLIFE	
Surveys have been completed. No goshawk detected.	

POW LLA Twin Mountain Unit 112



Unit 112							
Unit Number:	112	Total Harvest Unit Acres	10	Prescription:	UA	Harvest System:	Cable
VCU Number:	5871, 5880	LUD:	Modified Landscape, Timber Production		Net Harvest Volume (MBF):		807
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 moderate levels in this stand. The risk for windthrow in this stand is high due to existing stand and site characteristics, and being on a prominent knob exposed to wind from all directions. Old-growth stands tend to already exhibit uneven-aged structure to varying degrees. Uneven-aged management in old-growth stands should be designed to maintain multi-aged or multi-layered stand structure. Harvests must be designed so that future entries are not physically or economically isolated and so that tree regeneration is not excessively damaged. Harvests should maintain three or more distinct age classes in a reasonably well dispersed manner across the stand. Harvest openings must also be of sufficient size to allow regeneration of all species. Allow the intermediate age class to develop into mature trees and provide for another economical harvest. This unit lies within a 5-mile community buffer and requires the use of uneven-aged management. Group selections should harvest no more than 1/3 of the acres of the unit with no more than 2-acre openings. Harvest openings should be located to balance wildlife needs or meet other objectives (manage windthrow and/or allow for RAW) while creating an economical sale opportunity. Openings must be planned so that opportunities for the next harvest entry are not forfeited. This unit is within a legacy VCU, however, legacy retention is not required for group selection harvest.							
TIMBER/LOGGING							
This unit is planned for a combination of uphill and downhill yarding to landings located along a proposed temporary road off of NFSR 2054310.							
ENGINEERING/SYSTEM ROADS							
Access via existing NFS road 2054310 (BMP 14.20, Road-4, Road-6). New temporary road on existing prism 0.20 miles. (BMPs 14.5, Road-3, Road-6). New temporary road construction, 0.64 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 road 2054000. 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 POWLLA EIS 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							
Surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.							
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 112

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

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. The entire the unit is underlain by moderate vulnerability karst with three inclusions of high vulnerability surrounding discrete karst features. No harvest buffers have 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 as proposed as of 6/28/19.

RECREATION

No recreation concerns, as proposed, as of 09 July 2019.

SOILS/WETLANDS

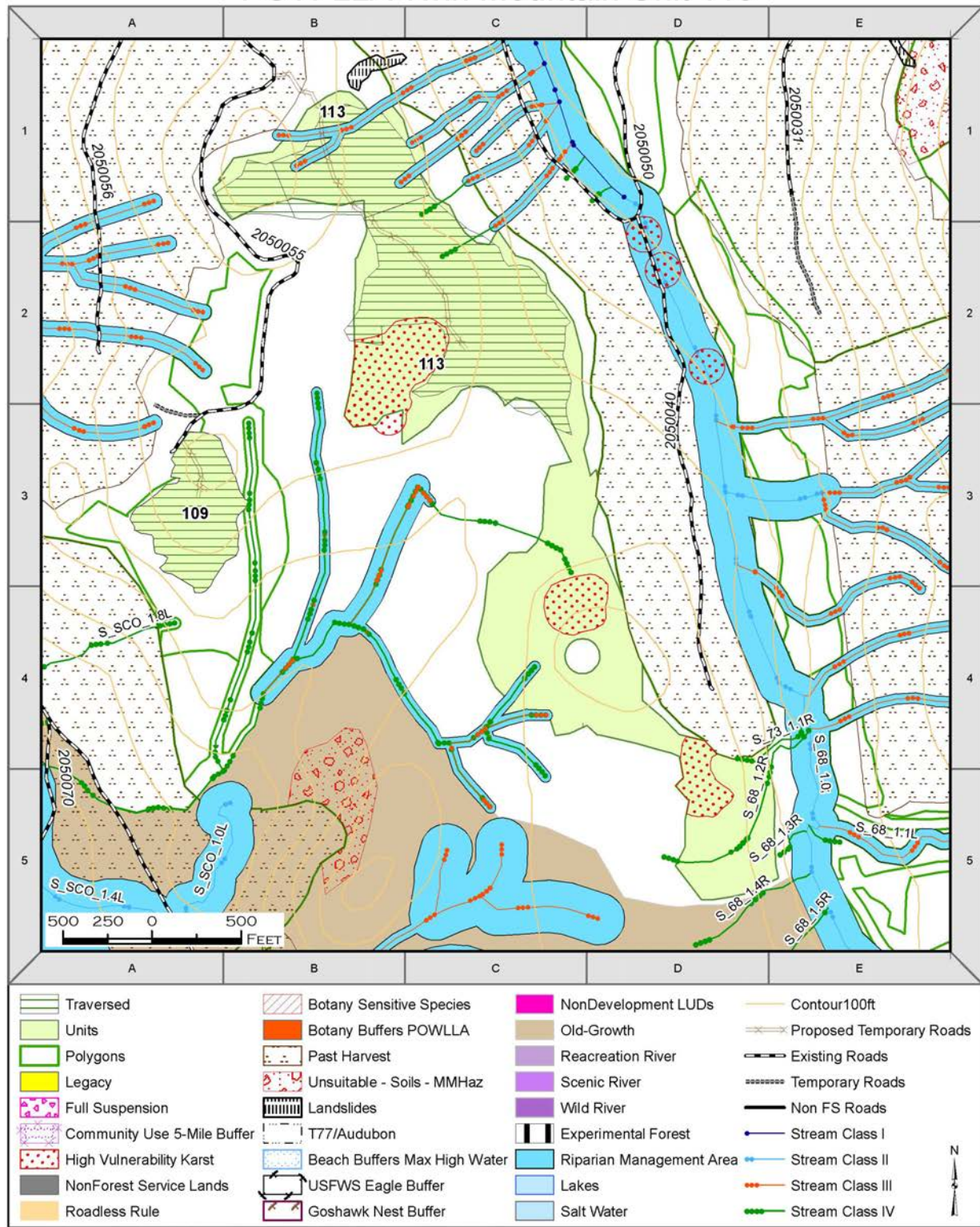
Slopes range from gentle to 55%. Small 50ft high cliff bands with >72% are located throughout the unit. There are about 15 acres of slopes > 72% on cliffs located outside of the unit boundary that are only suitable for harvest with full suspension. Inside the unit boundary, the soils and wetlands are gentle and 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 intermittent 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 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.

WILDLIFE

May/June goshawk surveys have been completed: no detections. July/August goshawk surveys have not been completed.

All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 113



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Unit 113							
Unit Number:	113	Total Harvest Unit Acres	69	Prescription	EA	Harvest System:	Shovel, Cable
VCU Number:	5900	LUD:	Timber Production		Net Harvest Volume (MBF):		828
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 entirely within a legacy VCU and is 69 acres in size. The required minimum legacy retention for this unit is 20.7 acres. Two young-growth stands, 25 and 50 years old, are adjacent to this unit. Neither of these stands are considered an opening per NFMA.							
TIMBER/LOGGING							
This unit is planned for a combination of shovel and uphill 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, 0.37 miles (BMPs 14.5, Road-3, Road-5, Road-6).							
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 Activities 13, 19, 23 and 24 in the POWLLA EIS 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							
Surveys are ongoing. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.							
Stream Num.: 68_1.0 Stream Class: II Channel Type: HCD, MCM 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. Class II for MCM: 100 feet or to the top of the side-slope break; whichever is greater. Concerns: N/A							

Unit 113	
Stream Num.:	68_1.2R
Stream Class:	IV
Channel Type:	PAO
Protection:	Category C
Flagging:	G/W
Buffer (RMA):	Class IV for PAO: No Buffer
Concerns:	N/A
Stream Num.:	68_1.3R
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.:	68_1.4R
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.:	73_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
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	
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. 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. Three no harvest buffers have been flagged surrounding these karst features. These areas are contained in the proposed legacy portions of the unit. A harvest method that obtains partial suspension is required on the moderate vulnerability karst.	
HERITAGE RESOURCES	

Unit 113

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 as proposed as of 7/2/19.

RECREATION

No recreation concerns, as proposed, as of 09 July 2019.

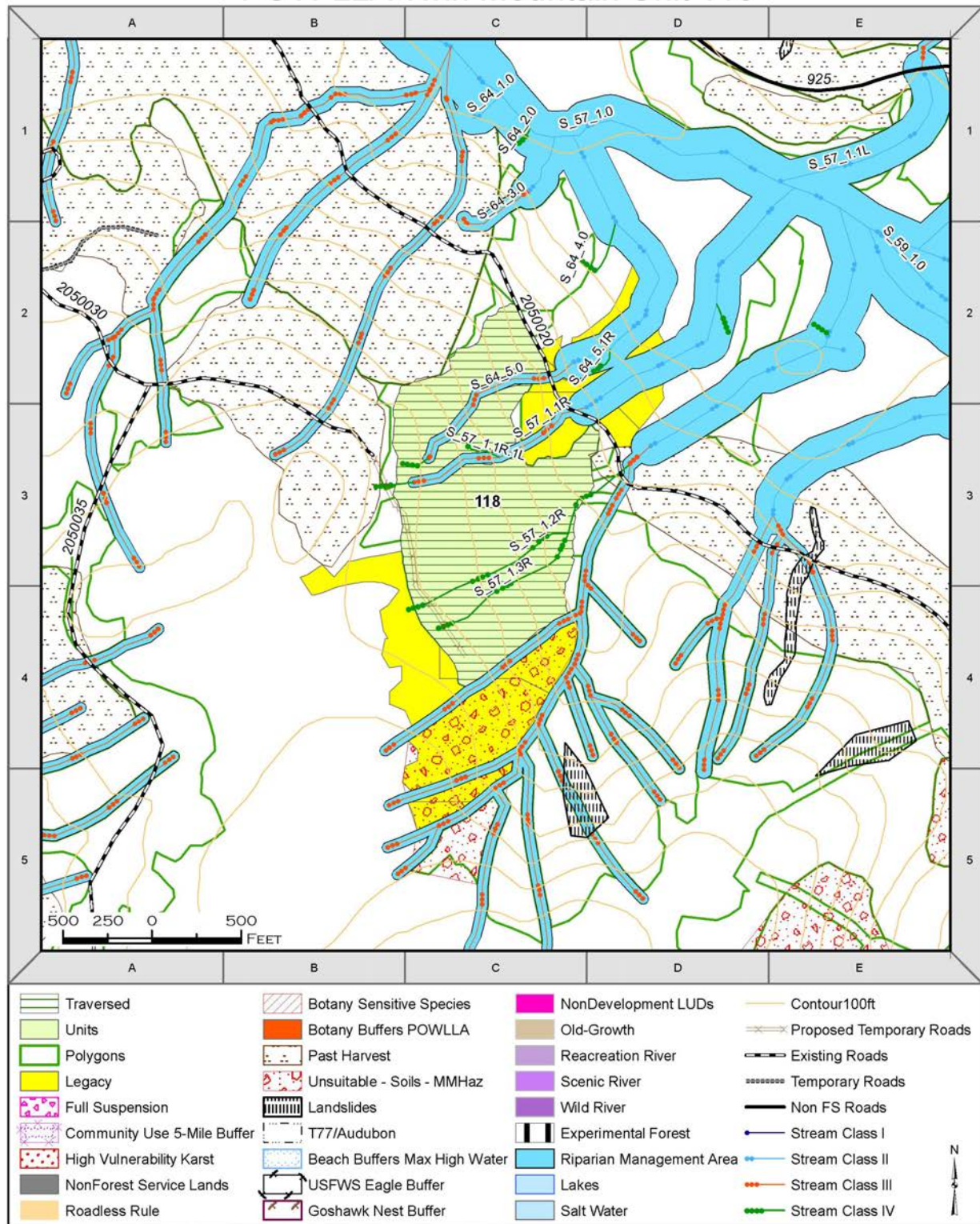
SOILS/WETLANDS

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 0.1 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

Surveys have been completed. No goshawk detections.

POW LLA Twin Mountain Unit 118



Unit 118						
Unit Number:	118	Total Harvest Unit Acres	33.7	Prescription:	EA	Harvest System: Cable
VCU Number:	5900	LUD:	Timber Production		Net Harvest Volume (MBF):	783
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. 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. A RAW review occurred for this unit but an additional buffer was determined to be unnecessary after field review by a team of specialists. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. Because the planned harvest unit is greater than 20 acres in size, legacy retention will be implemented to meet this requirement (Forest Plan, page 4-68).						
TIMBER/LOGGING						
This unit is planned for a combination of uphill and downhill 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, 0.25 miles (BMPs 14.5, Road-3, Road-5, Road-6).						
BOTANY						
Unit has not been surveyed due to time constraints. Unit has low probability of having sensitive plants. Unless surveys are conducted to confirm, activities may impact sensitive or rare plant individuals.						
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 Activities 13, 19, 23 and 24 in the POWLLA EIS 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:	III, IV					
Channel Type:	HCO					
Protection:	Category B,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					

Unit 118

Concerns: N/A

Stream Num.: 64_5.1R

Stream Class: III

Channel Type: AFH

Protection: Category B

Flagging: O/W

Buffer (RMA):

Class III for AFH: 140 feet or within the active portion of the alluvial fan; whichever is greater.

Concerns: N/A

Stream Num.: 57_1.1R

Stream Class: III

Channel Type: AFH

Protection: Category B

Flagging: O/W

Buffer (RMA):

Class III for AFH: 140 feet or within the active portion of the alluvial fan; whichever is greater.

Concerns: N/A

Stream Num.: 57_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.: 57_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.: 57_1.2R

Stream Class: III, IV

Channel Type: HCO

Protection: Category B,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.: 57_1.2R.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

Unit 118

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 crosses 3 Class IV streams.

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 as proposed as of 6/28/19.

RECREATION

No recreation concerns, as proposed, as of 09 July 2019.

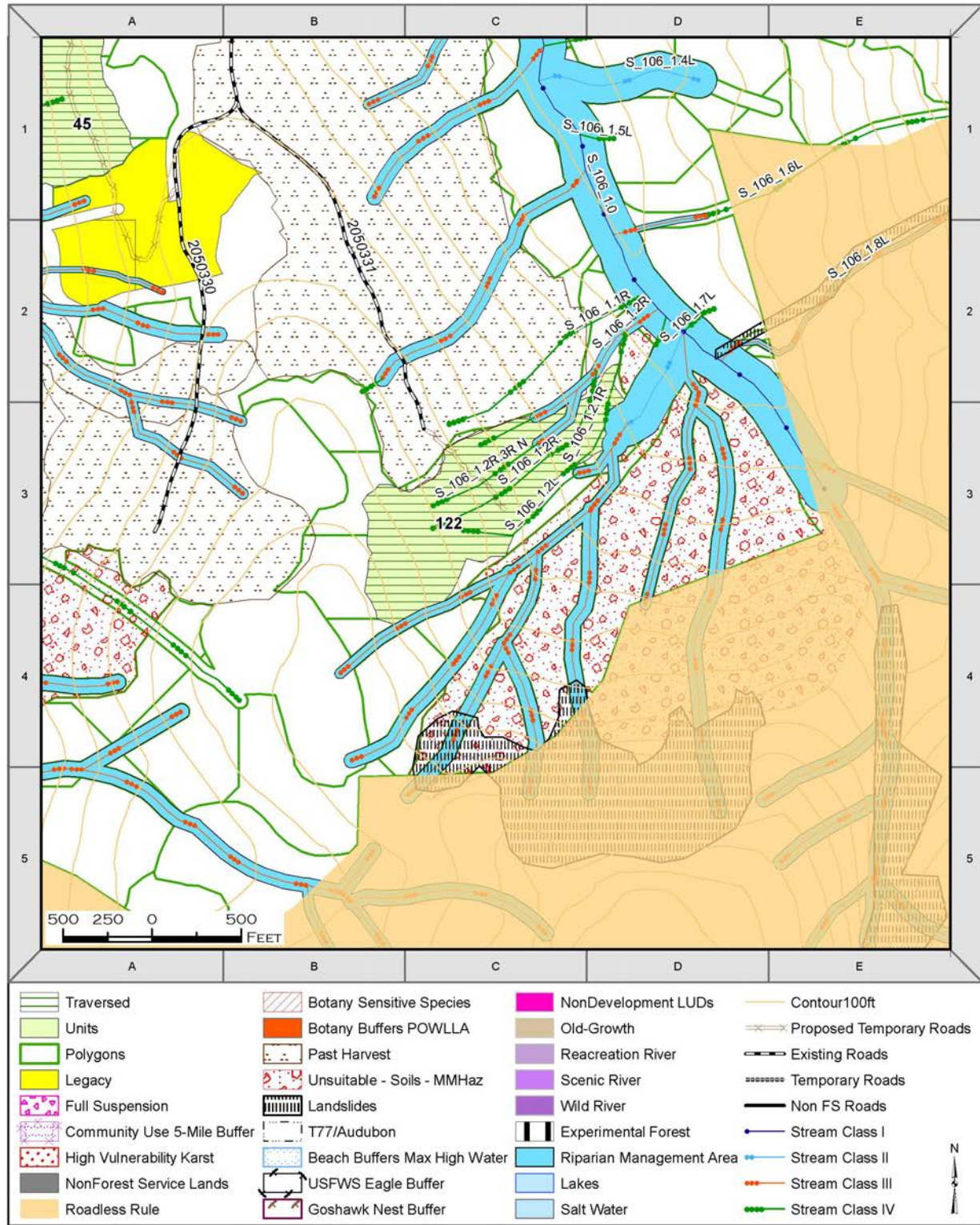
SOILS/WETLANDS

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 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

Unit greater than 1000 feet in elevation. Goshawk surveys not required.

POW LLA Twin Mountain Unit 122



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Unit 122						
Unit Number:	122	Total Harvest Unit Acres	19.9	Prescription:	EA	Harvest System: Cable
VCU Number:	5880	LUD:	Timber Production		Net Harvest Volume (MBF):	500
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 of 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. No concerns were identified in this unit that would require a review for a RAW buffer. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions; however, the harvest unit is less than 20 acres in size, so legacy retention is not required.						
TIMBER/LOGGING						
This unit is planned for a combination of uphill and downhill 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						
Unit has not been surveyed due to time constraints. Unit has low probability of having sensitive plants. Unless surveys are conducted to confirm, activities may impact sensitive or rare plant individuals.						
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 Activities 13, 19, 23 and 24 in the POWLLA EIS 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, IV					
Channel Type:	HCV, HCM					
Protection:	Category A, C					
Flagging:	B/W, O/W, G/W					
Buffer (RMA):						
Class HCV for II: 100 feet or to the top of the side-slope break; whichever is greater.						
Class HCV for III: To the top of the side-slope break						
Class HCM for IV: No buffer						
Concerns:	N/A					

Unit 122

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

Stream Num.: 106_1.2.1R
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class HCO for IV: No buffer
Concerns: N/A

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

Stream Num.: 106_1.2R.3R
Stream Class: III, IV
Channel Type: HCM, HCO
Protection: Category B, C
Flagging: O/W, G/W
Buffer (RMA):
Class HCM for III: To the top of the side-slope break
Class HCO for IV: 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 crossing for Class IV streams are planned.

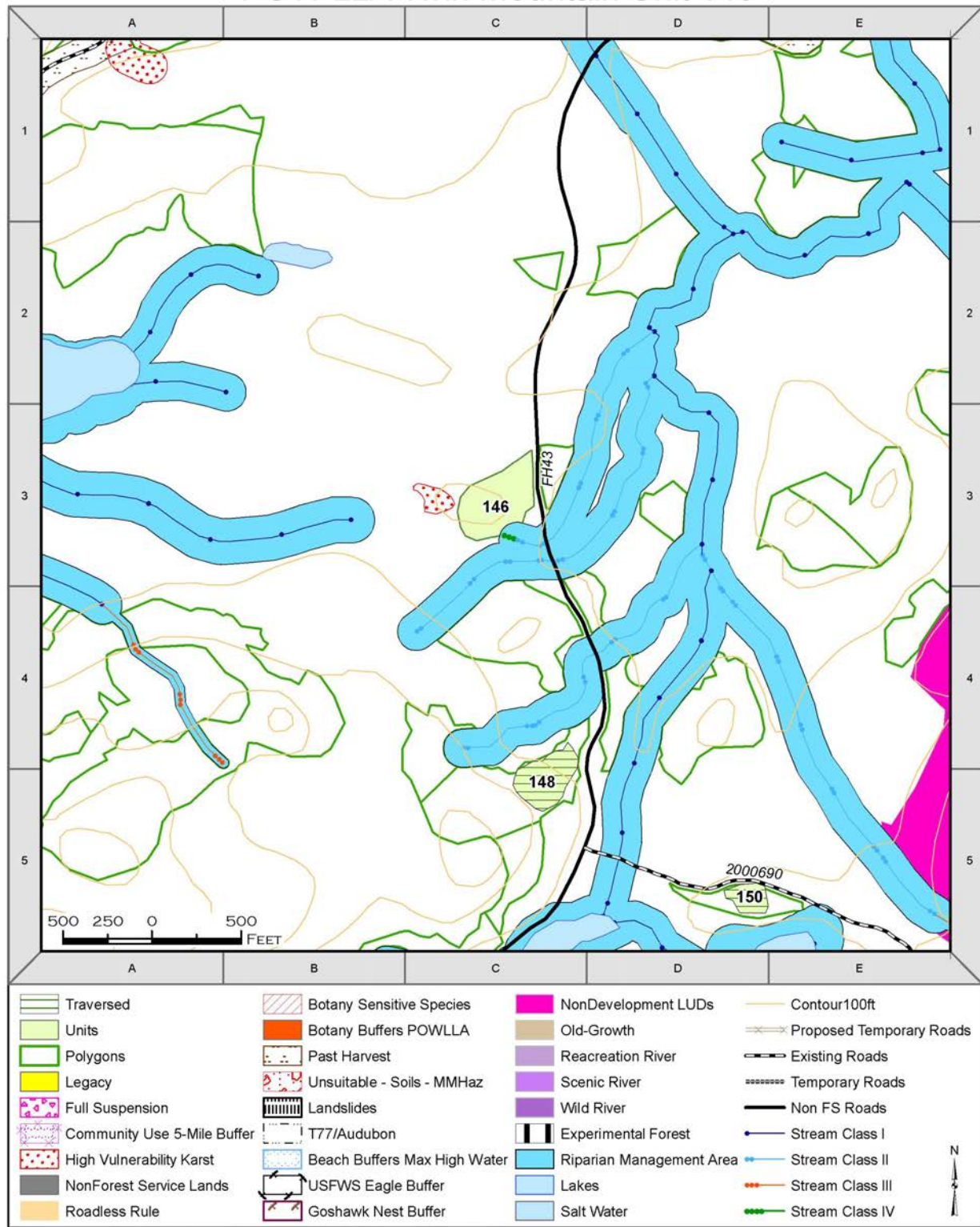
If any additional stream crossings are found, crossing structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist prior to construction (BMP 14.17). During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3 and 14.5.

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 122	
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 as proposed as of 6/28/19.	
RECREATION	
No recreation concerns, as proposed, as of 09 July 2019.	
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	
May/June goshawk surveys complete. July/August goshawk surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.	

POW LLA Twin Mountain Unit 146



Unit 146							
Unit Number:	146	Total Harvest Unit Acres	3	Prescription:	UA	Harvest System:	Shovel
VCU Number:	5492	LUD:	Timber Production		Net Harvest Volume (MBF):		15
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 trace insect damage as well. Mistletoe infections are not noted for this stand. The risk for windthrow in this stand is moderate due to existing stand and site characteristics, with trees being windthrown predominately from the east, but wind exposure from the southwest. Old-growth stands tend to already exhibit uneven-aged structure to varying degrees. Uneven-aged management in old-growth stands should be designed to maintain multi-aged or multi-layered stand structure. Harvests must be designed so that future entries are not physically or economically isolated and so that tree regeneration is not excessively damaged. Harvests should maintain three or more distinct age classes in a reasonably well dispersed manner across the stand. Harvest openings must also be of sufficient size to allow regeneration of all species. Allow the intermediate age class to develop into mature trees and provide for another economical harvest. This unit lies within a 5-mile community buffer and requires the use of uneven-aged management. Group selections should harvest no more than 1/3 of the acres of the unit with no more than 2-acre openings. Harvest openings should be located to balance wildlife needs or meet other objectives (manage windthrow and/or allow for RAW) while creating an economical sale opportunity. Openings must be planned so that opportunities for the next harvest entry are not forfeited.							
TIMBER/LOGGING							
This unit is planned for shovel yarding to landings located along SH FH43.							
ENGINEERING/SYSTEM ROADS							
Access via State Highway 43.							
BOTANY							
No botany concerns.							
INVASIVE SPECIES							
Weeds are in the area of the unit located along SH FH43. 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 POWLLA EIS 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.: 618_1.0 (Map Location C-3) Stream Class: II, IV Channel Type: HCO Protection: Category A, 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.							

Unit 146

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 road/stream crossings are anticipated. 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. A portion of the unit underlain by low vulnerability karst. 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 as proposed as of 7/2/19.

RECREATION

No recreation concerns, as proposed, as of 09 July 2019.

SOILS/WETLANDS

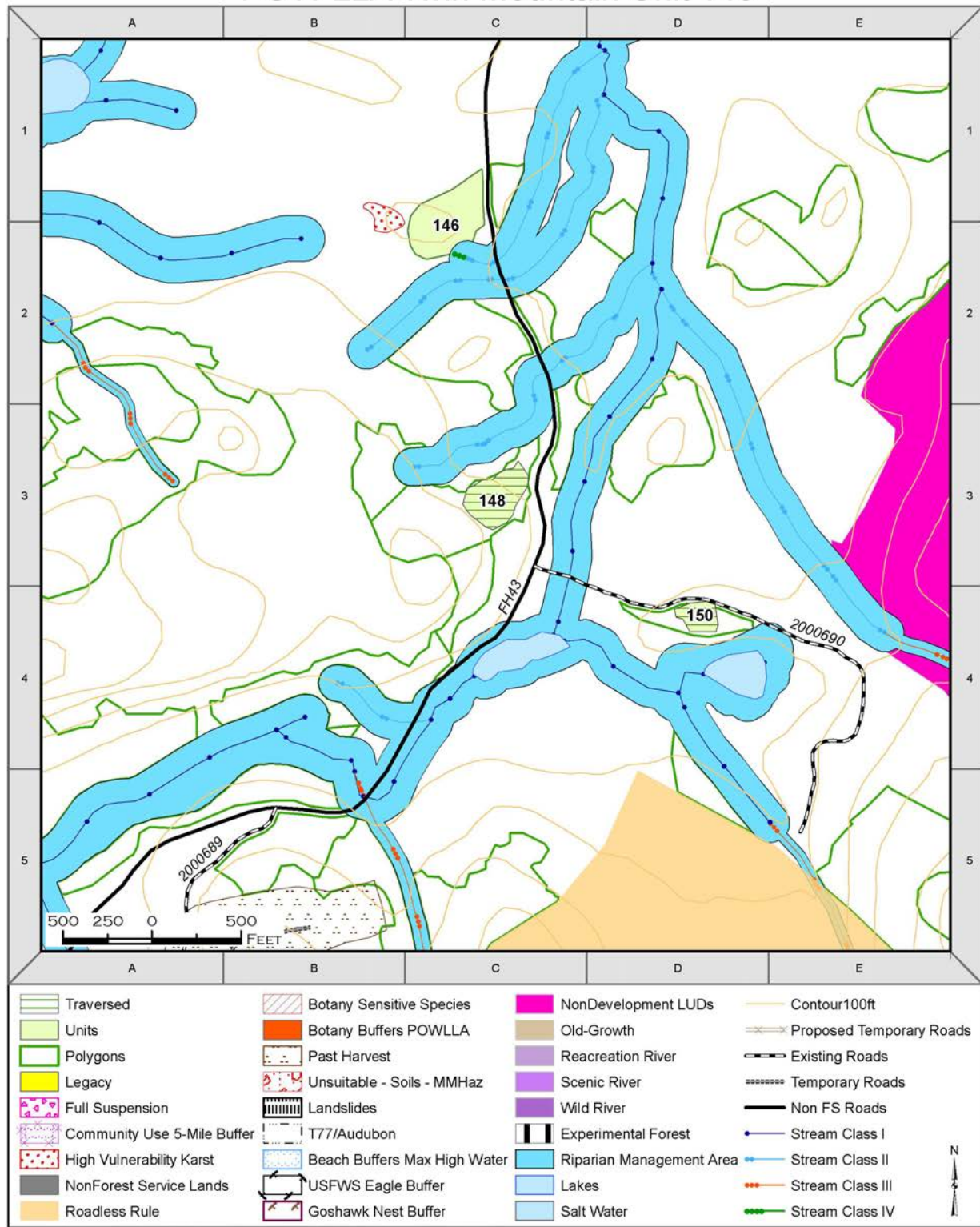
Slopes are gentle with small knobs up to 55%. The soils and wetlands are suitable for shovel yarding. Follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (R10 BMP 13.9 and National Core BMPs Plan-2, Veg-2, and Veg-4). Forested wetlands are located throughout the unit (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4).

WILDLIFE

May/June goshawk surveyed have been completed: no detections. July/August goshawk surveys have not been completed.

All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 148



Unit 148							
Unit Number:	148	Total Harvest Unit Acres	1.9	Prescription:	UA	Harvest System:	Cable
VCU Number:	5492	LUD:	Timber Production		Net Harvest Volume (MBF):		37
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 low 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 trace levels of insect damage as well. Mistletoe infections are not noted in this stand. The risk for windthrow in this stand is moderate due to existing stand and site characteristics, with moderate exposure to southeast winds and windthrown trees in the stand coming from the southeastern direction.							
Old-growth stands tend to already exhibit uneven-aged structure to varying degrees. Uneven-aged management in old-growth stands should be designed to maintain multi-aged or multi-layered stand structure. Harvests must be designed so that future entries are not physically or economically isolated and so that tree regeneration is not excessively damaged. Harvests should maintain three or more distinct age classes in a reasonably well dispersed manner across the stand. Harvest openings must also be of sufficient size to allow regeneration of all species. Allow the intermediate age class to develop into mature trees and provide for another economical harvest.							
This unit lies within a 5-mile community buffer and requires the use of uneven-aged management. Group selections should harvest no more than 1/3 of the acres of the unit with no more than 2-acre openings. Harvest openings should be located to balance wildlife needs or meet other objectives (manage windthrow and/or allow for RAW) while creating an economical sale opportunity. Openings must be planned so that opportunities for the next harvest entry are not forfeited.							
TIMBER/LOGGING							
This unit is planned for shovel yarding to landings located along SH FH43.							
ENGINEERING/SYSTEM ROADS							
Access via State Highway 43.							
BOTANY							
No botany concerns.							
INVASIVE SPECIES							
Weeds are in the area of the unit located along SH FH43. 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 POWLLA EIS 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						
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.:	Map Location C-3 & D-3						
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						

Unit 148

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

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 as proposed as of 7/2/19.

RECREATION

No recreation concerns, as proposed, as of 09 July 2019.

SOILS/WETLANDS

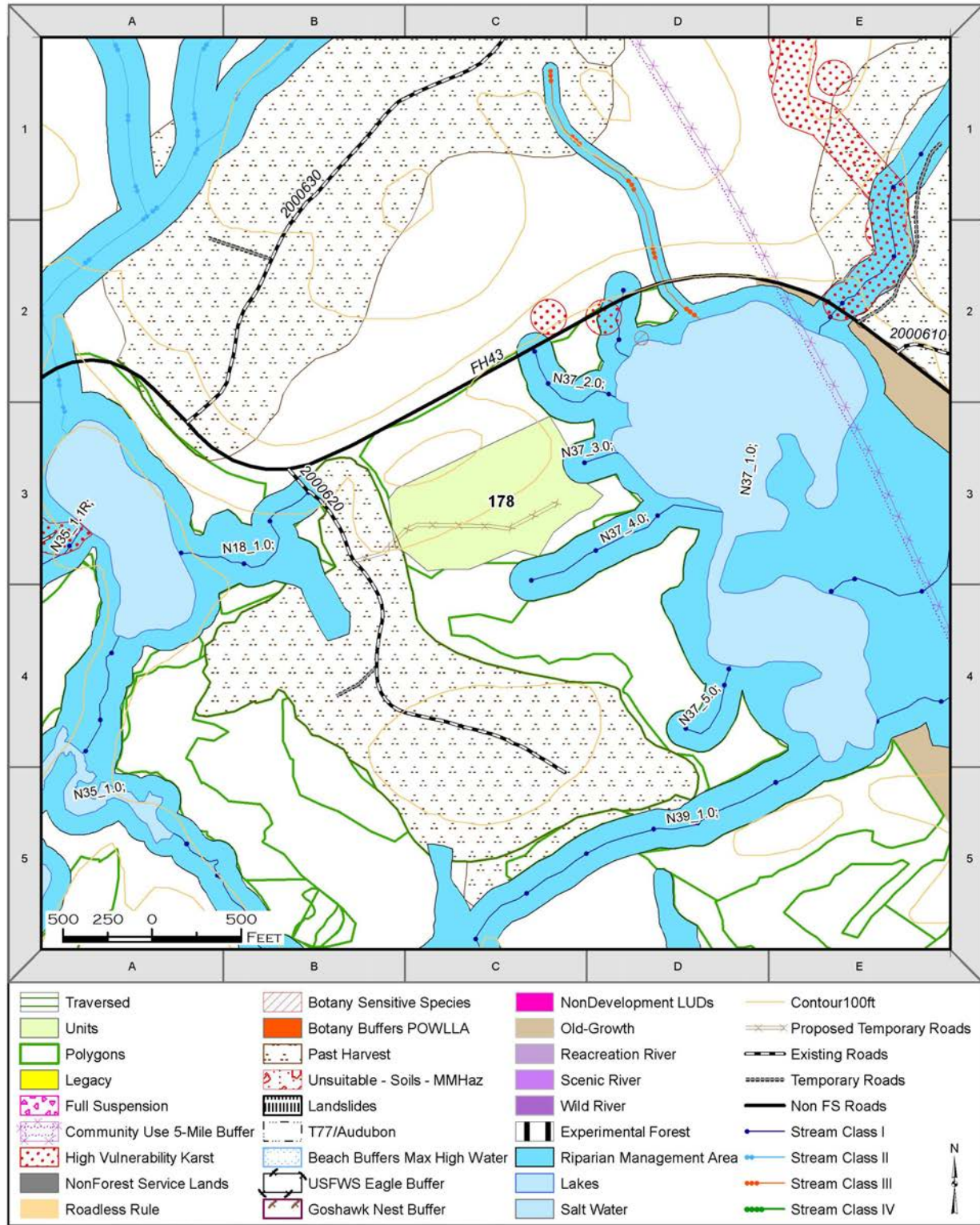
Slopes range from 25 to 55% throughout the unit. Several knobs and short rock outcrops are located in the unit. The unit is suitable for cable harvest with a minimum of partial suspension (R10 BMPS 12.5, 13.5, and 13.9 and National Core BMPs Plan-2, AqEco-2, AqEco-4, Veg-1, Veg-2, Veg-5, and Veg-6). Forested wetland/ emergent short sedge is intermixed with upland through the majority of the unit (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4). The proposed temporary road location will be reviewed prior to implementation. Follow R10 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.

WILDLIFE

May/June goshawk surveys complete-no detections. July/August goshawk surveys have not been completed.

All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 178



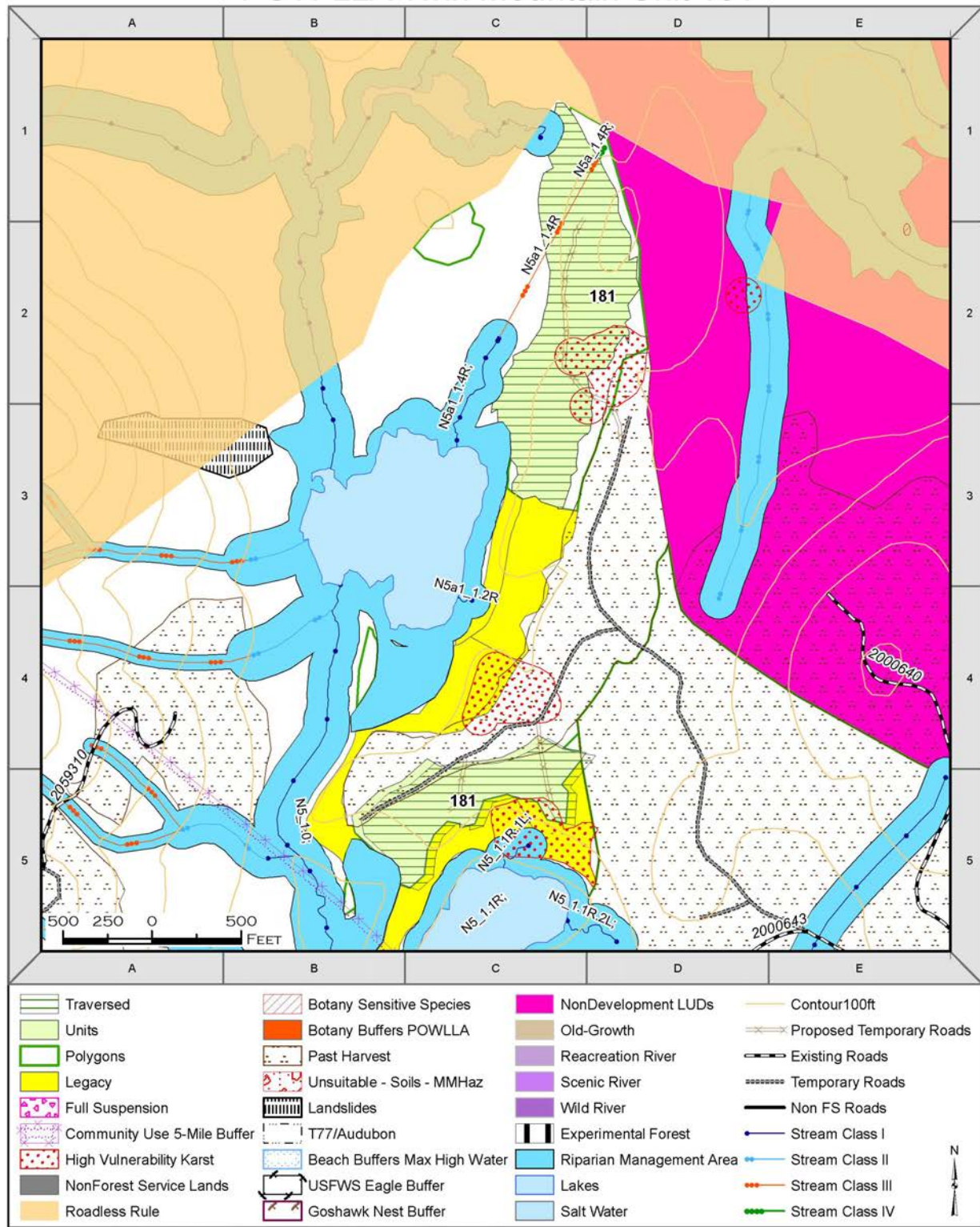
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Unit 178							
Unit Number:	178	Total Harvest Unit Acres	4	Prescription:	UA	Harvest System:	Cable
VCU Number:	5710	LUD:	Timber Production		Net Harvest Volume (MBF):		40
Summary of Concerns, Responses, BMPs, and Mitigations							
SILVICULTURE							
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 insect damage was noted in the overstory. Mistletoe infections are heavy with light physical defect and stem decay. The risk for windthrow in this stand is low. Old-growth stands tend to already exhibit uneven-aged structure to varying degrees. Uneven-aged management should be designed to create (young growth) or maintain (old growth) multi-aged or multi-layered stand structure. Harvests must be designed so that future entries are not physically or economically isolated and so that tree regeneration is not excessively damaged. Harvests should maintain three or more distinct age classes in a reasonably well dispersed manner across the stand. Harvest openings must also be of sufficient size to allow regeneration of all species. Allow the intermediate age class to develop into mature trees and provide for another economical harvest. This unit is located within 5 miles of a subsistence community. Uneven-aged management is required. Group selections will be up to 2 acres in size, between one tree length apart (120 feet) to 200 feet apart in moderate windthrow risk areas or 300 feet apart in high windthrow risk areas and should harvest no more than approximately 33 percent of the stand during any cutting cycle. Harvest openings should be located to balance wildlife needs or meet other objectives (manage windthrow and/or allow for RAW) while creating an economical sale opportunity. Openings must be planned so that opportunities for the next harvest entry are not negatively impacted. This unit lies within a legacy VCU, but due to constraints within the 5 mile community buffer, opening size will not trigger a need for legacy retention. Class I streams along the southern and eastern boundary may require RAW buffer.							
TIMBER/LOGGING							
This unit is planned for a combination of uphill and downhill yarding to landings located along a proposed temporary road with spurs off of NFSR 2000620.							
ENGINEERING/SYSTEM ROADS							
New temporary road construction, 0.40 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 SH FH43. 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 POWLLA EIS 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.:	37_2.0						
Stream Class:	I						
Channel Type:	PAB, MCO						
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							
Class I for MCO: 100 feet or to the top of the side-slope break; whichever is greater							
Concerns:	N/A						

Unit 178	
Stream Num.:	37_3.0
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.:	37_4.0
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
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	
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. The upper ¼ of the unit is underlain by moderate vulnerability karst. No significant karst features were found in this unit. A harvest method that obtains partial suspension is required on the moderate vulnerability karst. Karst Springs in the unit have been protected.	
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 as proposed as of 6/28/19.	
RECREATION	
No recreation concerns, as proposed, as of 09 July 2019.	
SOILS/WETLANDS	
Slopes are range from gentle to 55%. The soils and wetlands are suitable for shovel yarding and 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). 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 along the southern boundary of the unit (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4).	

Unit 178
The temporary road traverses about a ½ acre of forested wetland. Wetland avoidance was not feasible due to the location of the existing road, lake, knobs, and steep ground outside of the unit, 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
May/June goshawk surveys are complete: no detections. July/August goshawk surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 181

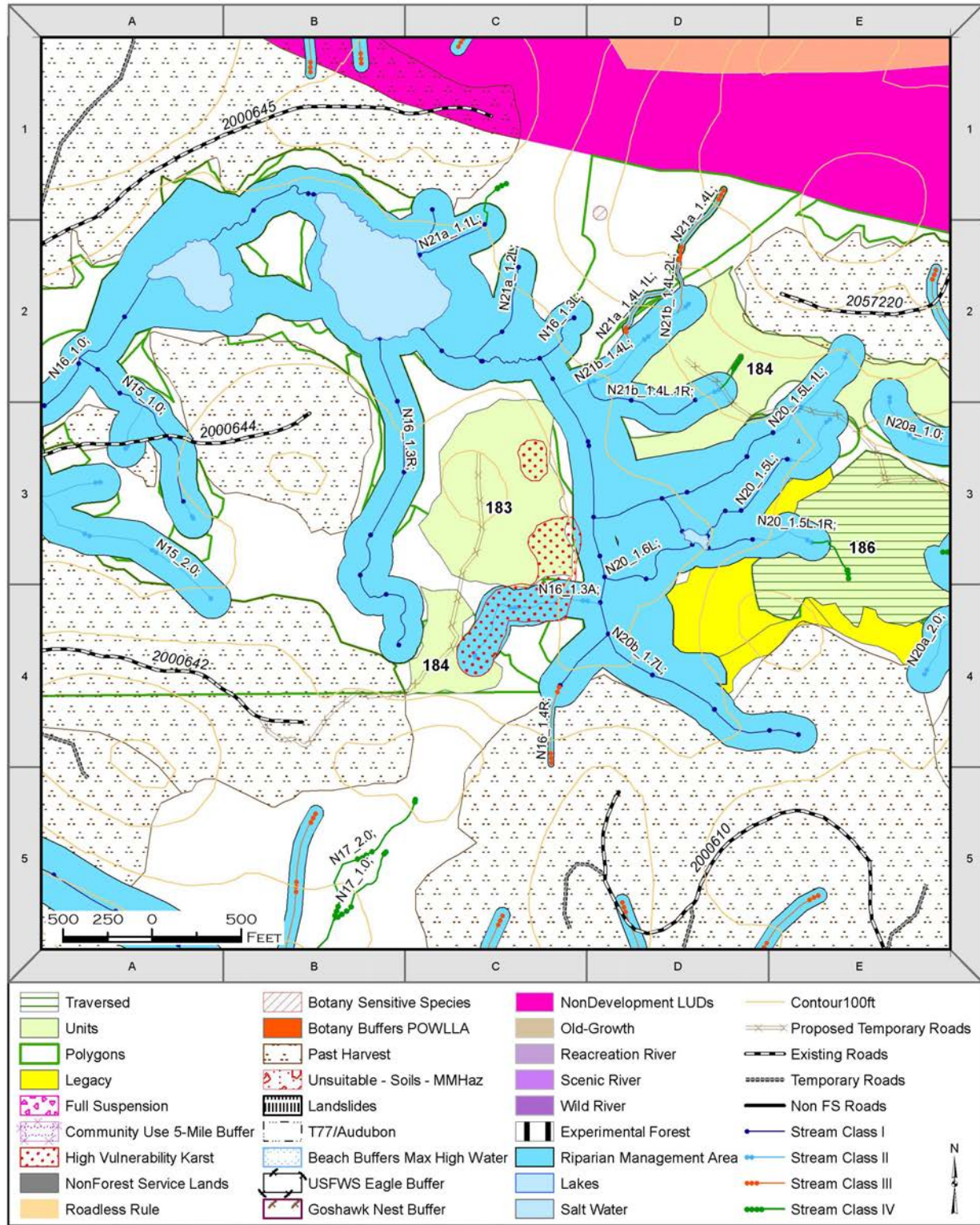


Unit 181						
Unit Number:	181	Total Harvest Unit Acres	10.3	Prescription:	EA	Harvest System: Shovel
VCU Number:	5710	LUD:	Timber Production	Net Harvest Volume (MBF):		237
Summary of Concerns, Responses, BMPs, and Mitigations						
SILVICULTURE						
Old-growth stands of this type are dominated by Sitka 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 legacy VCU and will require legacy retention as outlined in the Forest Plan, page 4-86.						
TIMBER/LOGGING						
This unit is planned for shovel yarding to landings located along a proposed temporary road with spurs off of NFSR 2000643.						
ENGINEERING/SYSTEM ROADS						
Access via existing NFS road 2000643 (BMP 14.20, Road-4, Road-6). New temporary road on existing prism 0.90 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 POWLLA EIS 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_1.0					
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.:	5a_1.4R					
Stream Class:	I, IV					
Channel Type:	PAQ, HCLw, K, HCOK					

Unit 181	
Protection:	Category A
Flagging:	B/W, G/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.	
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 III for K: No buffer on subsurface karst connector	
Class IV for HCOK: No buffer	
Concerns:	HCOK reach flows to karst insurgence
Stream Num.:	5_2.0
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
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 road/stream crossings are anticipated. 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 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	

Unit 181
No scenery concerns as proposed as of 7/2/19.
RECREATION
No recreation concerns, as proposed, as of 09 July 2019.
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 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
Surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 183

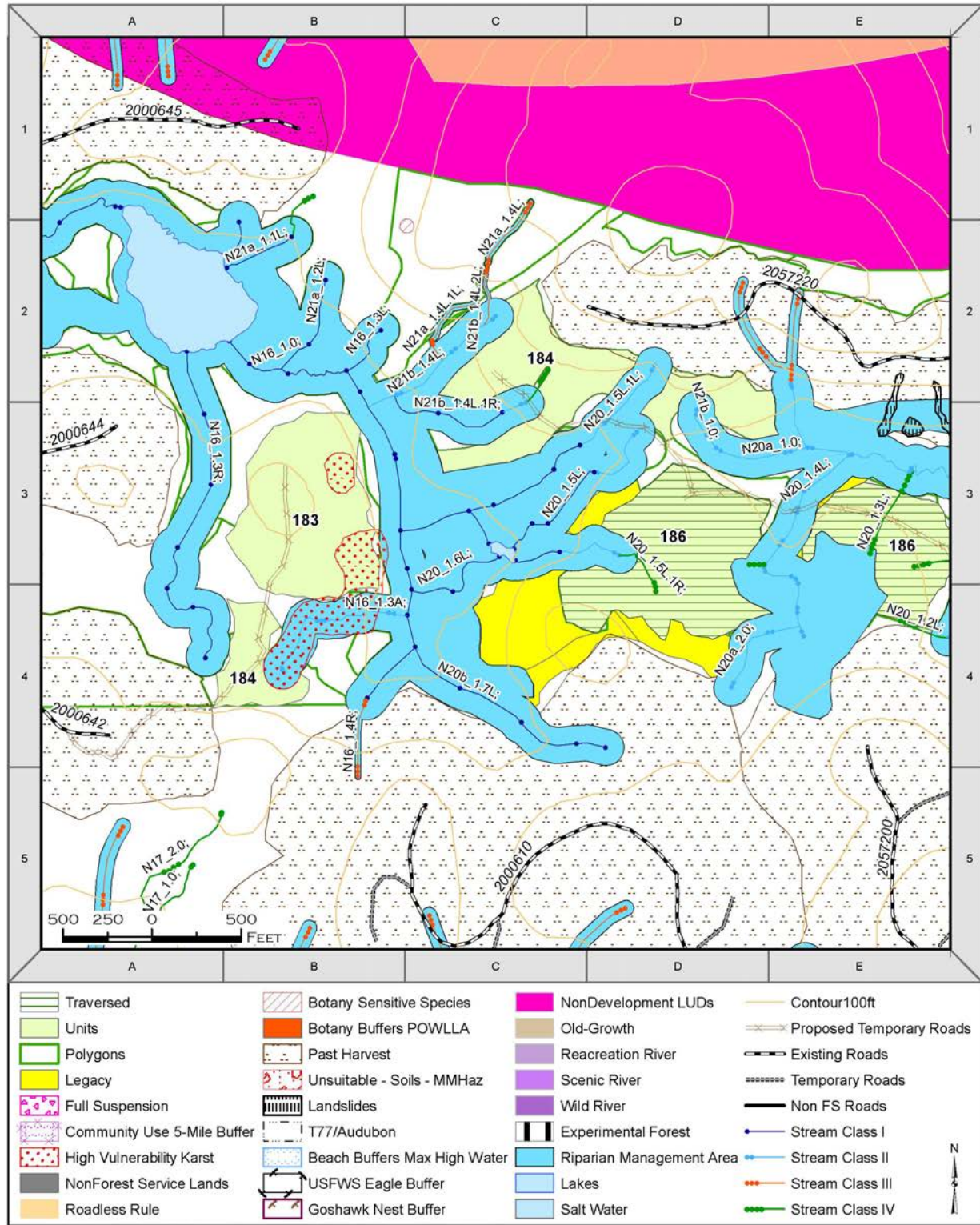


Unit 183							
Unit Number:	183	Total Harvest Unit Acres	16	Prescription:	EA	Harvest System:	Shovel
VCU Number:	5710	LUD:	Timber Production		Net Harvest Volume (MBF):		352
Summary of Concerns, Responses, BMPs, and Mitigations							
SILVICULTURE							
Old-growth stands of this type are dominated by 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 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. Trace insect damage was noted in the overstory. Mistletoe infections are moderate as is 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 unit is within a legacy VCU, however it is less than 20 acres in size and does not require legacy retention per Forest Plan direction. One young-growth stand to the west is approximately 30 years old and not considered an opening per NFMA. There are several Class I streams that bound this unit to the north, east and west and one class 2 stream to the southeast. Raw buffers may be required.							
TIMBER/LOGGING							
This unit is planned for shovel yarding to landings located along a proposed temporary road off of NFSR 2000642.							
ENGINEERING/SYSTEM ROADS							
Access via existing NFS road 2000642 (BMP 14.20, Road-4, Road-6). New temporary road construction, 0.48 miles (BMPs 14.5, Road-3, Road-5, Road-6).							
BOTANY							
Surveys have not been completed but will be required due to identified potential habitat for sensitive/rare plants within/near this unit. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.							
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 Activities 13, 19, 23 and 24 in the POWLLA EIS 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 (Yatuk Creek) Stream Class: I Channel Type: Lake, PAS, HCM, PAB 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. 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. Class I for HCM: 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: Additional RAW buffering is included in the layout of unit.							
Stream Num.: 16_1.3a							

Unit 183	
Stream Class:	II
Channel Type:	MCO, PAO
Protection:	Category A
Flagging:	B/W
Buffer (RMA):	
Class II for MCO: 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:	MCO reach flows to karst resurgence
Stream Num.:	16_1.3R
Stream Class:	I
Channel Type:	MCS, MMS
Protection:	Category A
Flagging:	B/W
Buffer (RMA):	
Class I for MCO: 100 feet or to the top of the side-slope break; whichever is greater.	
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
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 road/stream crossings are anticipated. 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 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 as proposed as of 7/2/19.	
RECREATION	
No recreation concerns, as proposed, as of 09 July 2019.	
SOILS/WETLANDS	
Slopes are generally less than 25% with slopes up to 55% around small rock knobs. 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	

Unit 183
short sedge occur along the southern boundary of the unit (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4). The temporary road traverses about a 0.1 acres of forested wetland/ emergent short sedge within the unit and about 0.1 acres outside of the unit. Wetland avoidance was not feasible due to the location of the existing road, streams and lake, 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
Goshawks observed in area in 2016. May/June 2019 goshawk surveys done-no detections. July/August surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 184



Unit 184							
Unit Number:	184	Total Harvest Unit Acres	22	Prescription:	EA	Harvest System:	Shovel, Cable
VCU Number:	5710	LUD:	Timber Production		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. 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 entirely within a legacy VCU. Legacy calculations combine units 184 and 186 due to adjacency. There are multiple Class I and Class II stream adjacent to this unit. Legacy retention areas should provide additional RAW protection to TTRAs. There are a several young-growth stands adjacent to this unit. They range in age from 22 to 42 years. None of these stands are considered openings per NFMA.							
TIMBER/LOGGING							
This unit is planned for a combination of shovel, uphill and downhill yarding to landings located along a proposed temporary road off of NFSR 2000642 and along a proposed temporary road off of NFSR 2057220.							
ENGINEERING/SYSTEM ROADS							
Access via existing NFS roads 2000642 and 2057220 (BMP 14.20, Road-4, Road-6). New temporary road construction, 1.07 miles (BMPs 14.5, Road-3, Road-5, Road-6). Temporary fish stream crossings require approved crossing structure and concurrence with ADF&G. Temporary road to be closed and structures removed immediately after timber harvest is complete. 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.							
BOTANY							
Surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.							
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 Activities 13, 19, 23 and 24 in the POWLLA EIS 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: I Channel Type: HCM, PAB							

Unit 184

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.

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.: 16_1.3a

Stream Class: II

Channel Type: MCO, PAO

Protection: Category A

Flagging: B/W

Buffer (RMA):

Class II for MCO: 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: MCO reach flows to karst insurgence

Stream Num.: 16_1.3L

Stream Class: I

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.: 16_1.3R

Stream Class: I

Channel Type: MMS, PAO

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 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.: 16_1.4R

Stream Class: I, III

Channel Type: PAB, HCO

Protection: Category A, B

Flagging: B/W, O/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 III for HCO: To the top of the side-slope break

Concerns: N/A

Stream Num.: 20a_1.0

Stream Class: II

Channel Type: PAS

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.

Concerns: N/A

Unit 184

Stream Num.: 20_1.5L
Stream Class: I
Channel Type: FPO, PAO, Lake, HCO
Protection: Category A
Flagging: B/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 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 Lake: 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 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 HCO: 100 feet or to the top of the side-slope break; whichever is greater.

Concerns: N/A

Stream Num.: 20a_1.5L.1L
Stream Class: I, II, III
Channel Type: PAO, MMO, HCO
Protection: Category A, B
Flagging: B/W, O/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 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 III for HCO: To the top of the side-slope break

Concerns: N/A

Stream Num.: 20_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.: 21b_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.: 21a_1.4L or 21b_1.4L
Stream Class: I, II
Channel Type: HCO, AFO
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.

Class I for AFO: 140 feet or within the active portion of the alluvial fan; whichever is greater.

Class II for HCO: To the top of the side-slope break

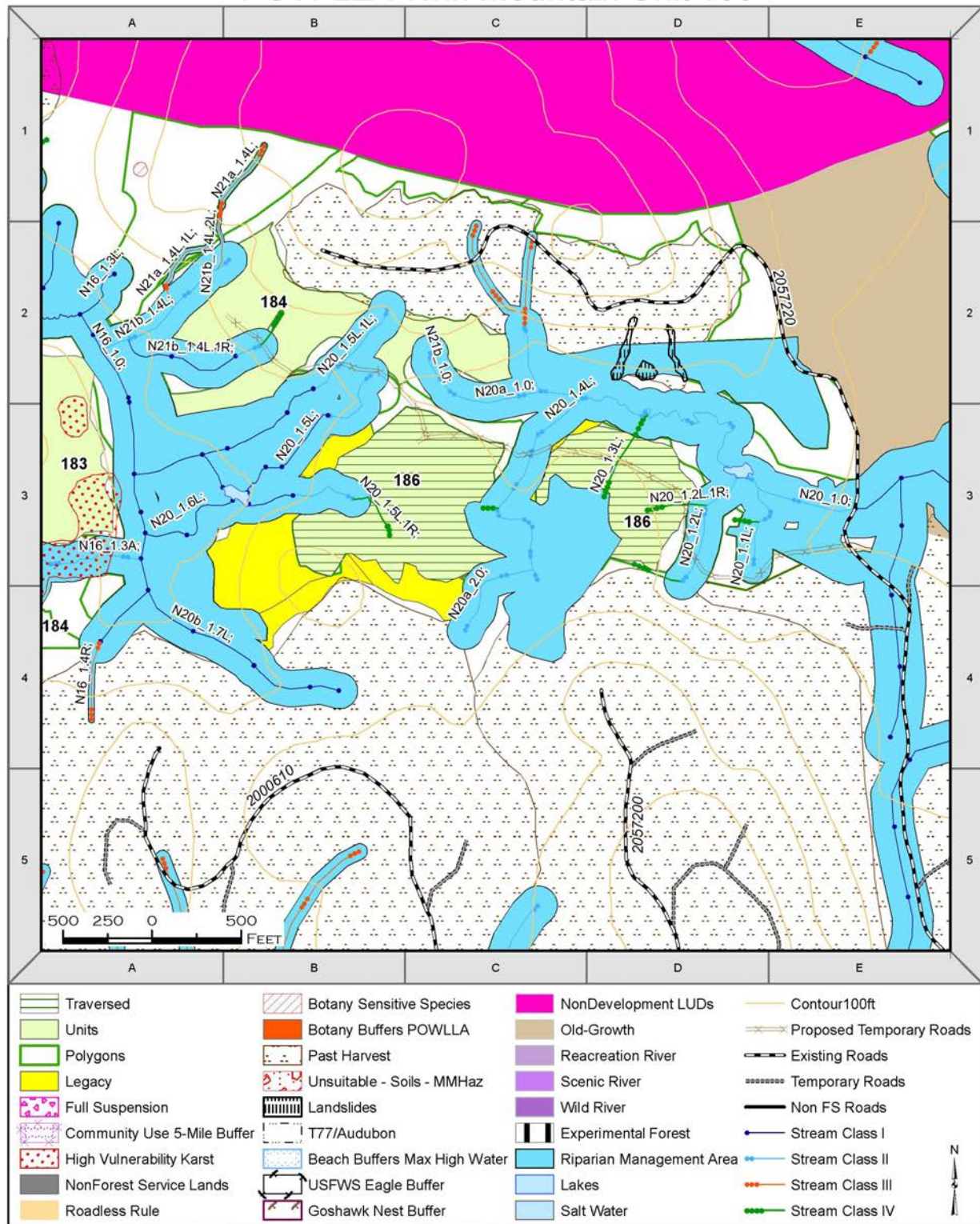
Concerns: N/A

Stream Num.: 21b_1.4L.1L

Unit 184	
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.:	21b_1.4L.1R
Stream Class:	I, II
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.
Class II 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.	
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 is planned to cross Class II Stream Num. 20_1.2L and Class II Stream Num. 20_1.4L. This will require Title 16 concurrence and must meet fish timing requirements for construction. Stream crossing structures will be removed immediately following operations. Temporary road also crosses Class IV Stream Nums. 20_1.2.1R, 20_1.3R and 21b_1.4L.1R.	
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. The southwestern setting of the unit is underlain by moderate vulnerability karst with an inclusion 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 as proposed as of 7/2/19.	
RECREATION	
No recreation concerns, as proposed, as of 09 July 2019.	
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 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). Follow shovel yarding	

Unit 184
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
Probable NOGO detections in 2017. Territorial behavior. Goshawk nest discovered in 2019. Most of unit impacted by nest buffer. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 186



Unit 186						
Unit Number:	186	Total Harvest Unit Acres	40	Prescription:	EA	Harvest System: Shovel
VCU Number:	5710	LUD:	Timber Production	Net Harvest Volume (MBF):		540
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. Mistletoe infections are moderate. The risk for windthrow in this stand is moderate. Old-growth stands tend to already exhibit uneven-aged structure to varying degrees. Uneven-aged management in old-growth stands should be designed to maintain multi-aged or multi-layered stand structure. Harvests must be designed so that future entries are not physically or economically isolated and so that tree regeneration is not excessively damaged. Harvests should maintain three or more distinct age classes in a reasonably well dispersed manner across the stand. Harvest openings must also be of sufficient size to allow regeneration of all species. Allow the intermediate age class to develop into mature trees and provide for another economical harvest. This unit lies entirely within a legacy VCU. Legacy calculation combines units 184 and 186 due to adjacency. RAW buffers on Class I and II streams to the north, east and west of the unit. Legacy retention planned for this unit will assist with RAW on residual TTRA. Two young-growth units approximately 32 and 41 years in age border this unit to the south. Neither of these stands are considered openings per NFMA.						
TIMBER/LOGGING						
Preliminary timber survey walk-through has been completed. Other required surveys have not been completed. Unit will be refined after Out-year Plan comment period and all surveys have been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.						
ENGINEERING/SYSTEM ROADS						
Access via existing NFS road 2057220 (BMP 14.20, Road-4, Road-6). New temporary road construction, 0.52 miles (BMPs 14.5, Road-3, Road-5, Road-6). Temporary fish stream crossings require approved crossing structure and concurrence with ADF&G. Temporary road to be closed and structures removed immediately after timber harvest is complete. 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.						
BOTANY						
Unit has not been surveyed due to time constraints. Unit has low probability of having sensitive plants. Unless surveys are conducted to confirm, activities may impact sensitive or rare plant individuals.						
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 Activities 13, 19, 23 and 24 in the POWLLA EIS 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_1.0					
Stream Class:	II					
Channel Type:	PAB, PAS, HCO					
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. 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.					

Unit 186

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

Stream Class: II, IV

Channel Type: MMO, HCO

Protection: Category A, 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

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.: 20_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.: 20_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 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 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 flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater.

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 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.: 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

Unit 186

Stream Num.: 20_1.5L
 Stream Class: I
 Channel Type: PAO, HCL
 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 HCL: 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: IV
 Channel Type: HCO
 Protection: Category C
 Flagging: G/W
 Buffer (RMA):
 Class IV for HCO: No buffer
 Concerns: N/A

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.: 20a_2.0
 Stream Class: II
 Channel Type: PAO
 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.
 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.

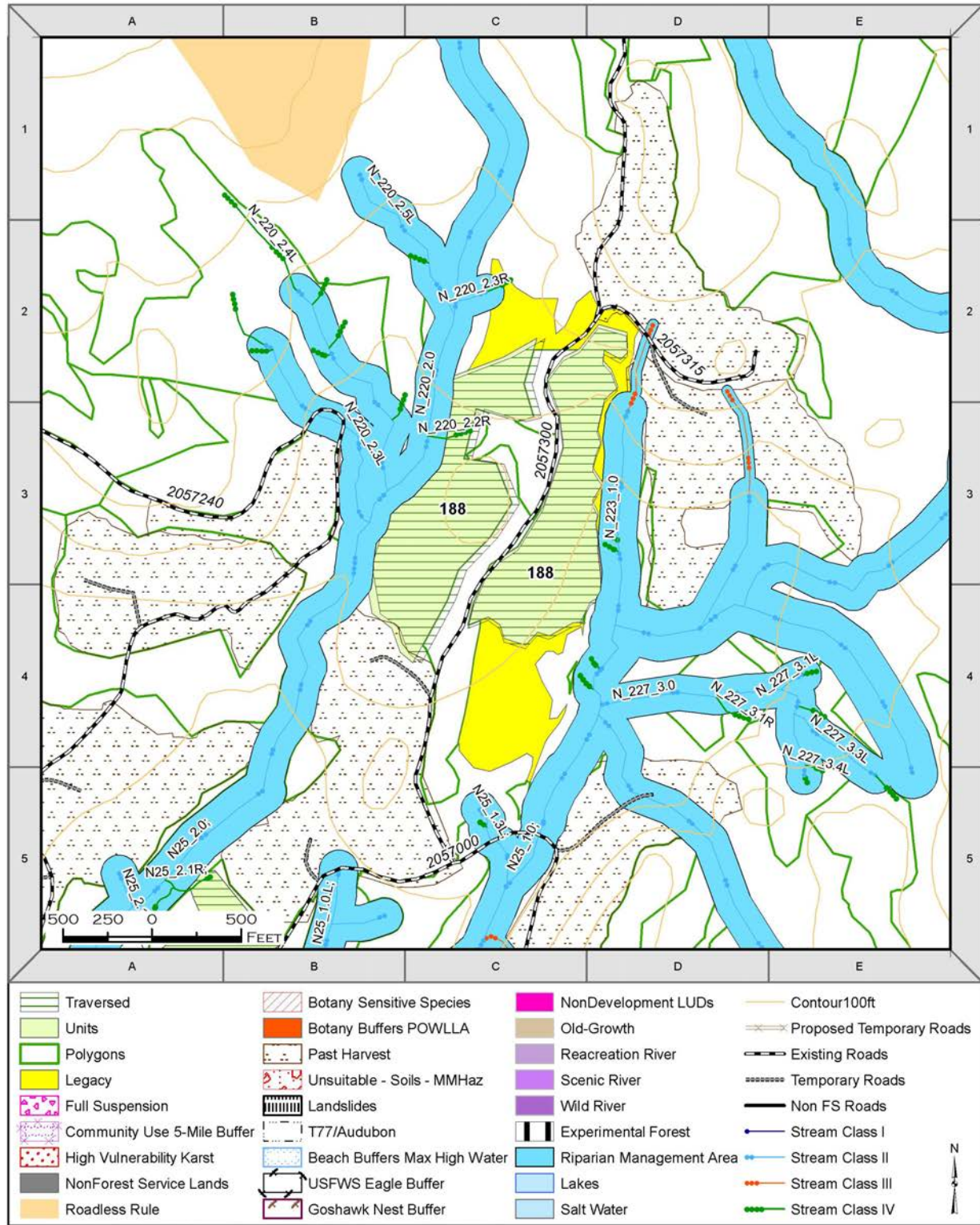
Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.

ROAD/STREAM CROSSING SUMMARY

Temporary road is planned to cross Class II Stream Num. 20_1.2L and Class II Stream Num. 20_1.4L. This will require Title 16 concurrence and must meet fish timing requirements for construction. Stream crossing structures will be removed immediately following operations. Temporary road also crosses Class IV Stream Num. 20_1.2.1R and 20_1.3R.

Unit 186
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 as proposed as of 6/28/19.
RECREATION
No recreation concerns, as proposed, as of 09 July 2019.
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
Probable NOGO in 2017. Territorial behavior. May be same pair as detected in 2017 in Unit 181. May/June 2019 goshawk surveys complete-no detections. Unit boundary impacted due to buffer on goshawk nest in unit 184. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 188



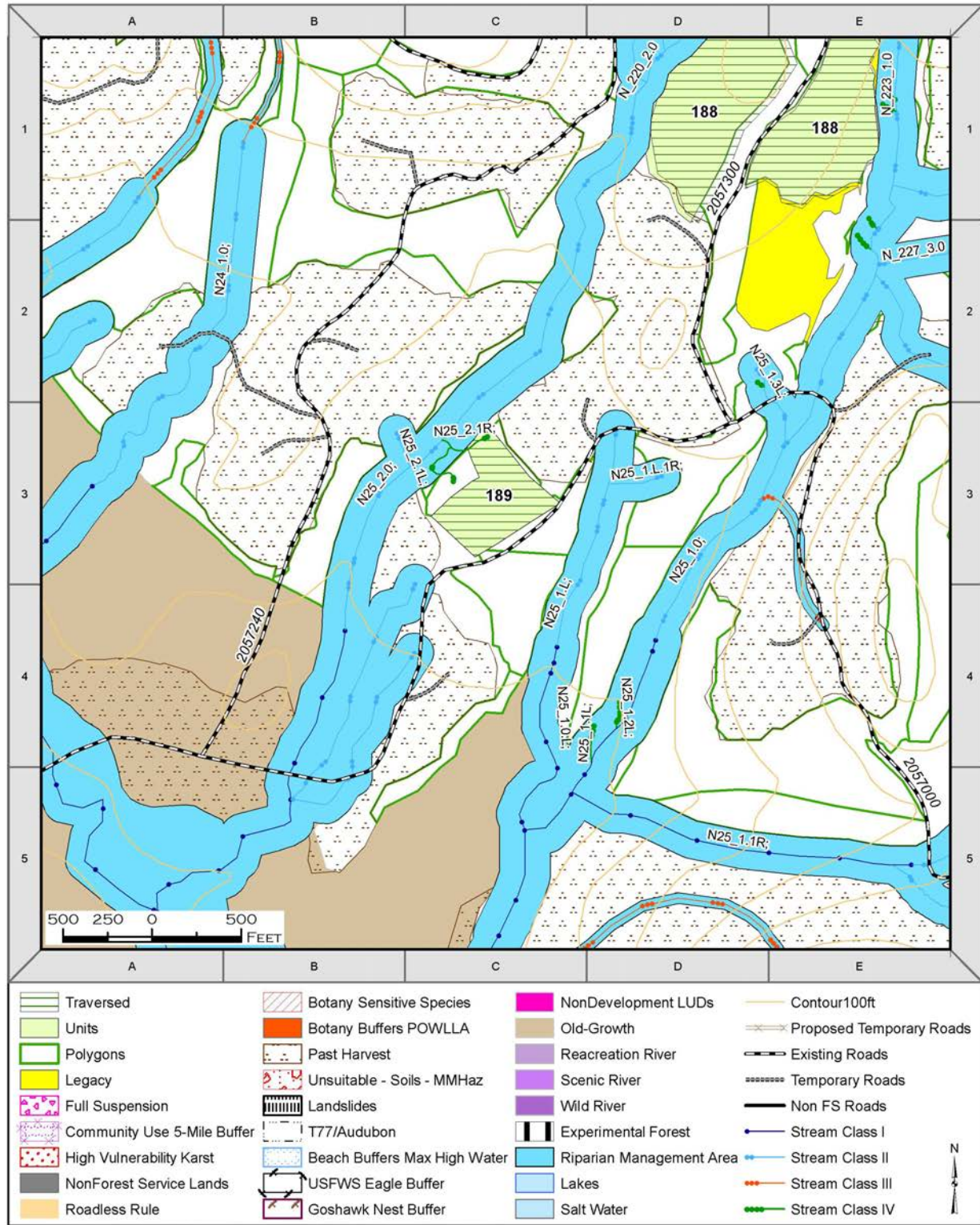
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Unit						
Unit Number:	188	Total Harvest Unit Acres	31.3	Prescription:	EA	Harvest System: Shovel
VCU Number:	5710	LUD:	Timber Production	Net Harvest Volume (MBF):		720
Summary of Concerns, Responses, BMPs, and Mitigations						
SILVICULTURE						
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 entirely within a legacy VCU. Retention areas have been mapped along the TTRA buffer to assist with windfirmness so no additional RAW buffers should be required on the Class II streams located along the eastern and western boundaries of the unit. Three young-growth stands are within proximity to this stand, the youngest being approximately 20 years old and the oldest 30. None of these stands are considered openings per NFMA.						
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 POWLLA EIS 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					

Unit	
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_1.0
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.:	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
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
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 road/stream crossings are anticipated. 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 as proposed as of 7/2/19.
RECREATION
No recreation concerns, as proposed, as of 09 July 2019.
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). Temporary road access into the western polygon will need to be reviewed prior to implementation.
WILDLIFE
Unit surveyed 1x in 2018. May/June goshawk survey complete. No detections. July/August goshawk surveys not complete. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 189



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Unit 189						
Unit Number:	189	Total Harvest Unit Acres	5.6	Prescription:	EA	Harvest System: Shovel
VCU Number:	5710	LUD:	Timber Production	Net Harvest Volume (MBF):		128
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 stand lies entirely within a legacy VCU and will require legacy retention as outlined in the Forest Plan, page 4-86. Multiple Class I and Class II streams bisect this unit and bound it on the east and west. Most of the retention areas coincide with Class I TTRAs and will also function as RAW buffers. There young-growth stands adjacent to this harvest that are approximately 30 years old and not considered openings per NFMA. There is a small 1/2 acre muskeg located in a portion of the unit.						
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 POWLLA EIS 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_1.0					
Stream Class:	II					
Channel Type:	HCM, MCS					
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.					
Class II for MCS:	100 feet or to the top of the side-slope break; whichever is greater.					
Concerns:	N/A					
Stream Num.:	25_1.0.L					

Unit 189

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

Stream Num.: 25_1.L.1R
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.: 25_1.3L
Stream Class: II
Channel Type: HCO, MMO
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.
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.
Concerns: N/A

Stream Num.: 25_1.3L.1L
Stream Class: IV
Channel Type: MMO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for MMO: No buffer
Concerns: N/A

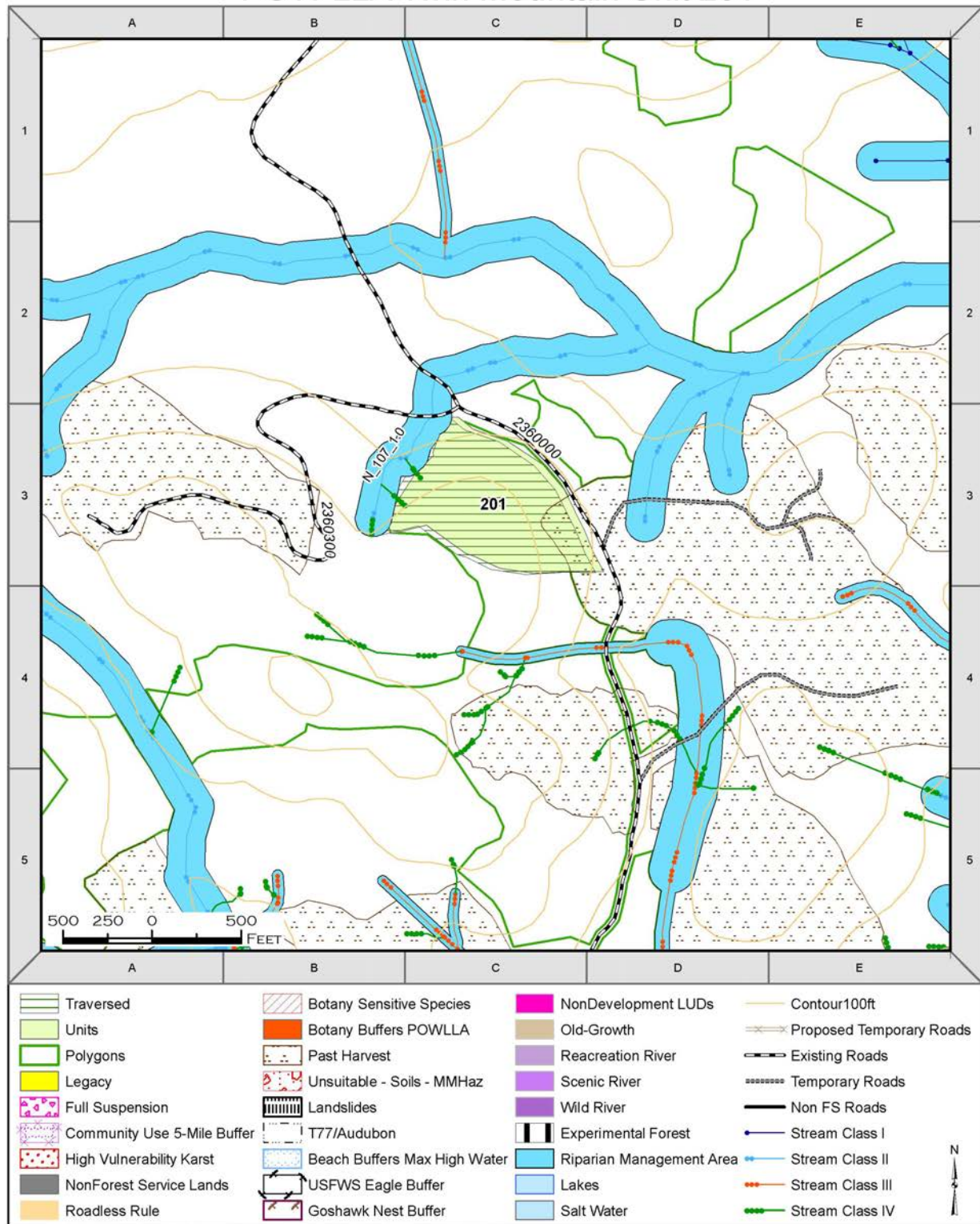
Stream Num.: 25_2.0
Stream Class: II
Channel Type: MMS
Protection: Category A
Flagging: B/W
Buffer (RMA):
Class II for MMS: 120 feet or to the extent of the flood plain, riparian vegetation or soils, or riparian associated wetland fens; whichever is greater.
Concerns: N/A

Stream Num.: 25_2.1R
Stream Class: IV
Channel Type: PAO
Protection: Category C
Flagging: G/W
Buffer (RMA):
Class IV for PAO: No buffer
Concerns: N/A

Stream Num.: 25_2.1R.1R
Stream Class: IV
Channel Type: PAO
Protection: Category C
Flagging: G/W

Unit 189	
Concerns:	N/A
Buffer (RMA):	
Class IV for PAO:	No buffer
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 road/stream crossings are anticipated. 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 as proposed as of 7/2/19.	
RECREATION	
No recreation concerns, as proposed, as of 09 July 2019.	
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 complete. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.	

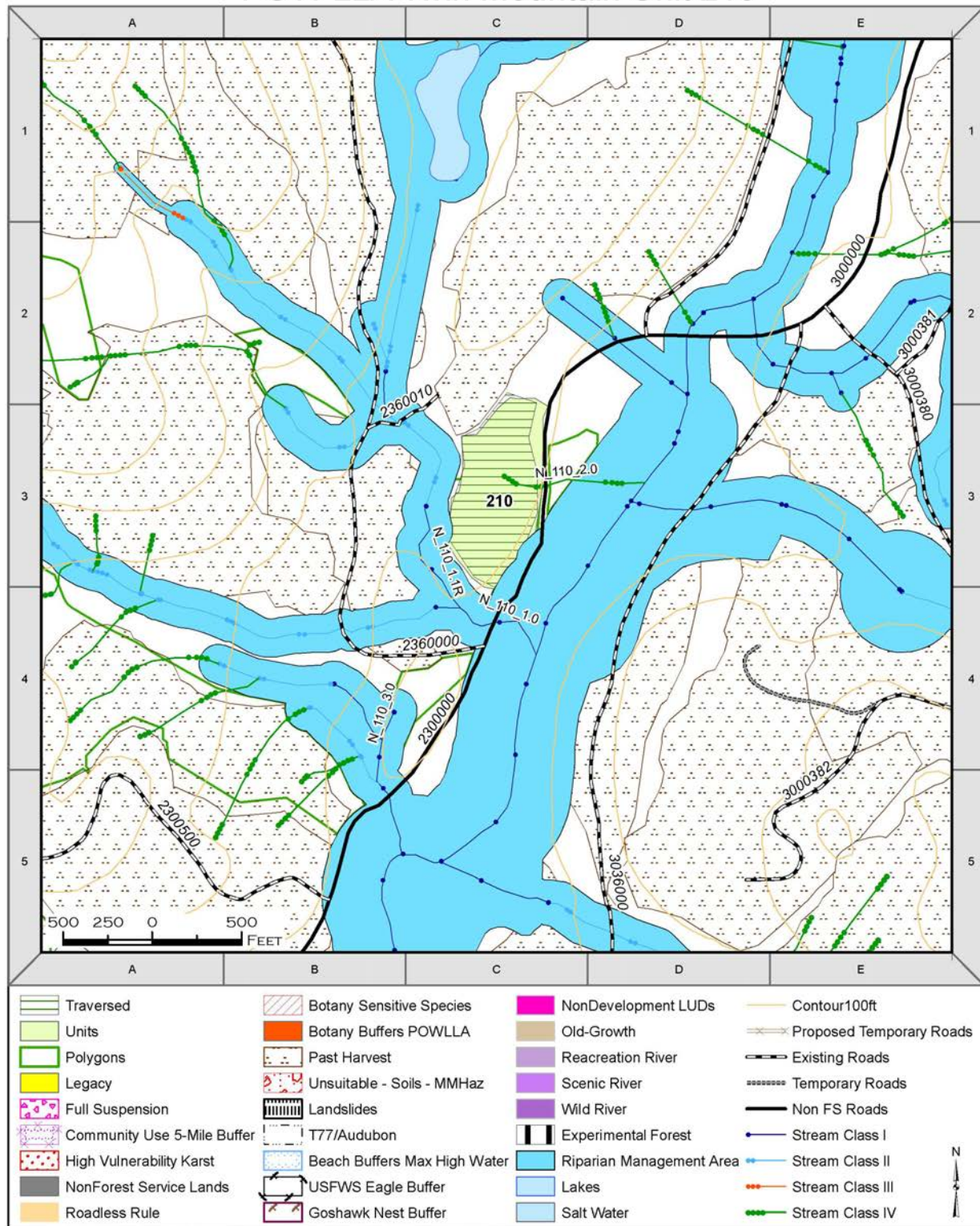
POW LLA Twin Mountain Unit 201



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):		319
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 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.						
TIMBER/LOGGING						
This unit is planned for a combination of shovel and downhill yarding to landings located along NFSR 2360000.						
ENGINEERING/SYSTEM ROADS						
Access via existing NFS road 2360000 (BMP 14.20, Road-4, Road-6).						
BOTANY						
Unit has not been surveyed due to time constraints. Unit has low probability of having sensitive plants. Unless surveys are conducted to confirm, activities may impact sensitive or rare plant individuals.						
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 POWLLA EIS 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:	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.:	107_1.1L					
Stream Class:	IV					
Channel Type:	HCLw					
Protection:	Category C					
Flagging:	G/W					

Unit 201
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
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 road/stream crossings are anticipated. 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 as proposed as of 7/2/19.
RECREATION
No recreation concerns, as proposed, as of 09 July 2019.
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 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 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 wetland are present throughout the unit (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4).
WILDLIFE
2 partial surveys in 2017. May/June goshawk surveys complete-no detections. July/August goshawk surveys not done. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 210

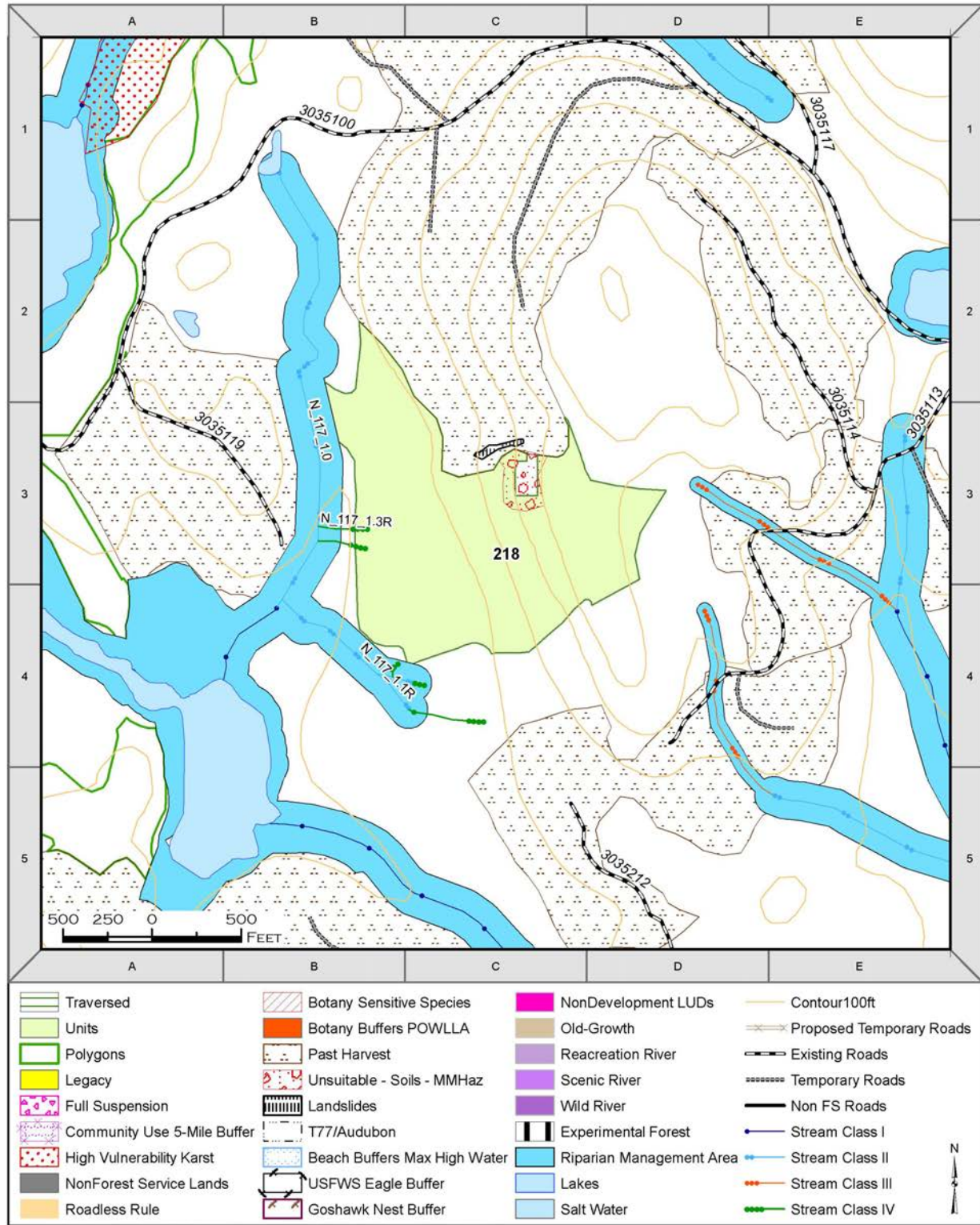


Unit 210						
Unit Number:	210	Total Harvest Unit Acres	8.9	Prescription:	EA	Harvest System: Shovel
VCU Number:	5770	LUD:	Timber Production	Net Harvest Volume (MBF):		202
Summary of Concerns, Responses, BMPs, and Mitigations						
SILVICULTURE						
Old-growth stands of this type are dominated by western 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. 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 SH 2300000.						
ENGINEERING/SYSTEM ROADS						
Surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.						
BOTANY						
Unit has not been surveyed due to time constraints. Unit has low probability of having sensitive plants. Unless surveys are conducted to confirm, activities may impact sensitive or rare plant individuals.						
INVASIVE SPECIES						
There are documented invasive plant infestations near this unit, including infestations of <i>Cirsium arvense</i> (Canada thistle) and <i>Cirsium vulgare</i> (bull thistle), located along the 2300000 road. 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 POWLLA EIS (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.					
Concerns:	N/A					
Stream Num.:	110_1.0R					
Stream Class:	I, II					

Unit 210	
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:	HCLw
Protection:	Category C
Flagging:	G/W
Buffer (RMA):	Class IV for HCO: No Buffer
Concerns:	N/A
Stream Num.:	Map Location C-4
Stream Class:	I
Channel Type:	FPL
Protection:	Category A
Flagging:	B/W
Buffer (RMA):	Class I for FPL: 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
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 road/stream crossings are anticipated. 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 as proposed as of 7/2/19.	
RECREATION	
No recreation concerns, as proposed, as of 09 July 2019.	
SOILS/WETLANDS	

Unit 210
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 National Core BMPs AqEco-2 and AqEco-4).
WILDLIFE
Surveys have been completed. No goshawks detected.

POW LLA Twin Mountain Unit 218



Unit 218							
Unit Number:	218	Total Harvest Unit Acres	40.6	Prescription:	EA	Harvest System:	Shovel, Cable
VCU Number:	5770	LUD:	Timber Production		Net Harvest Volume (MBF):		800
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 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 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.							
TIMBER/LOGGING							
This unit is planned for a combination of shovel and uphill yarding to landings located along a proposed temporary road off of NFSR 3035113.							
ENGINEERING/SYSTEM ROADS							
Surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.							
BOTANY							
Unit has not been surveyed due to time constraints. Unit has low probability of having sensitive plants. Unless surveys are conducted to confirm, activities may impact sensitive or rare plant individuals.							
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 Activities 13, 19, 23 and 24 in the POWLLA EIS 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.:	117_1.0						
Stream Class:	I, II						
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 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 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						

Unit 218

Stream Num.: 117_1.1R
 Stream Class: II, IV
 Channel Type: MMS, MMO, HCLw, HCO
 Protection: Category A, C
 Flagging: B/W, G/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 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 HCLw: 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.: 117_1.1R.1L
 Stream Class: II, IV
 Channel Type: HCO
 Protection: Category A, 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.: 117_1.1R.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

Stream Num.: 117_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.: 117_1.3R
 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 D-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

Unit 218

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 location not established. 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

Surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

RECREATION

No recreation concerns, as proposed, as of 09 July 2019.

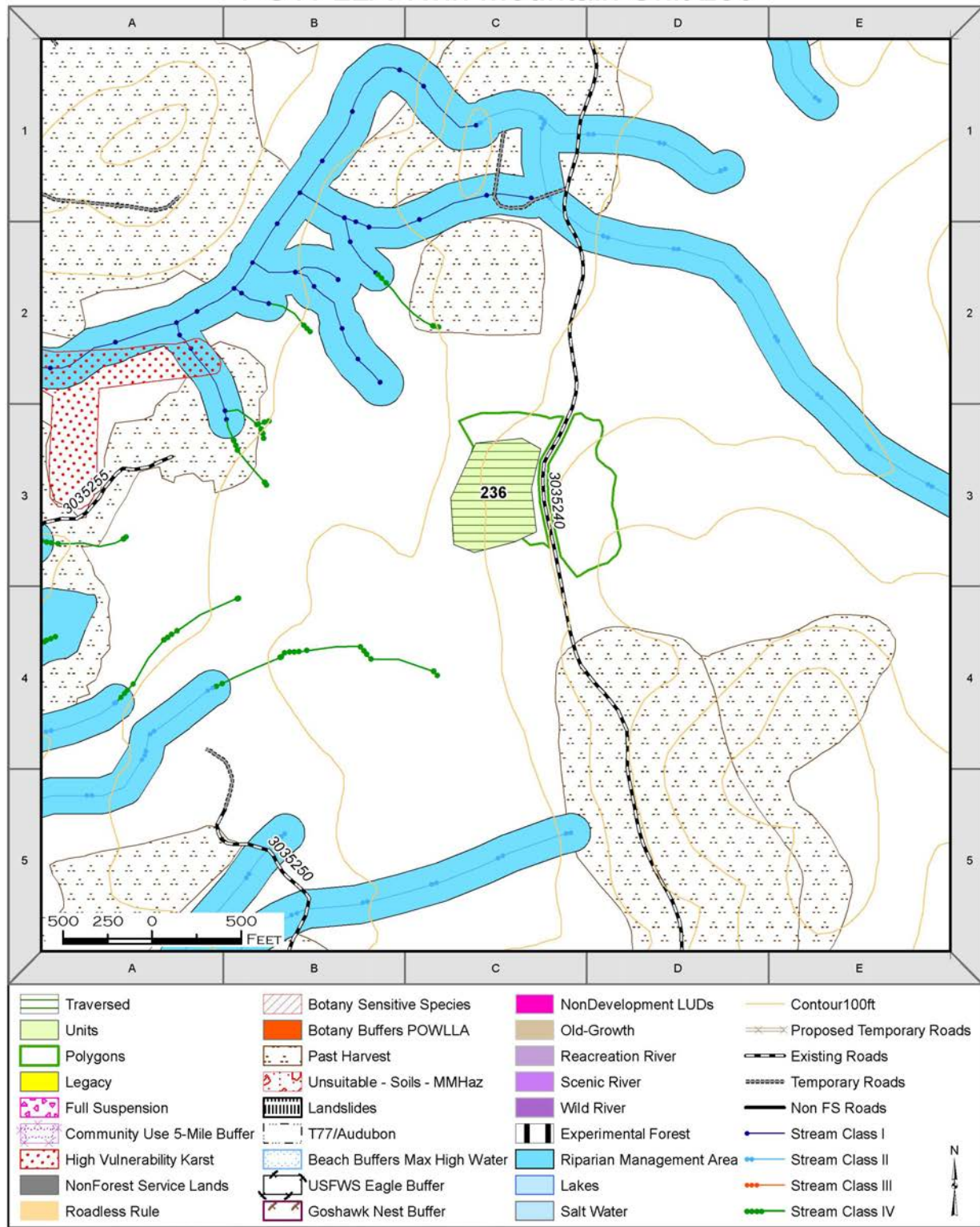
SOILS/WETLANDS

Slopes range from gentle to greater than 72%. There is a cliff band of slopes >72% that run north and south. About 2 acres of the northernmost section of this cliff band is unsuitable for harvest consideration due to very high landslide prone terrain, wet steep slopes, and colluvial activity. The remainder of the 2 acres within the unit are suitable for harvest with partial suspension. All slopes 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). On gentler slopes, 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). Temporary road access will be reviewed prior to implementation. Follow R10 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.

WILDLIFE

May/June goshawk surveys complete: no detections. July/August goshawk surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 236



Unit 236							
Unit Number:	236	Total Harvest Unit Acres	5.7	Prescription:	EA	Harvest System:	Shovel, Cable
VCU Number:	5770	LUD:	Timber Production		Net Harvest Volume (MBF):		132
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. A RAW buffer along the Class II 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 a combination of shovel and uphill yarding to landings located along NFSR 3035240.							
ENGINEERING/SYSTEM ROADS							
Access via existing NFS road 3035240 (BMP 14.20, Road-4, Road-6).							
BOTANY							
Unit has not been surveyed due to time constraints. Unit has low probability of having sensitive plants. Unless surveys are conducted to confirm, activities may impact sensitive or rare plant individuals.							
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 Activities 13, 19, 23 and 24 in the POWLLA EIS 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, 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							

Unit 236

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 road/stream crossings are anticipated. 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 as proposed as of 7/2/19.

RECREATION

No recreation concerns, as proposed, as of 09 July 2019.

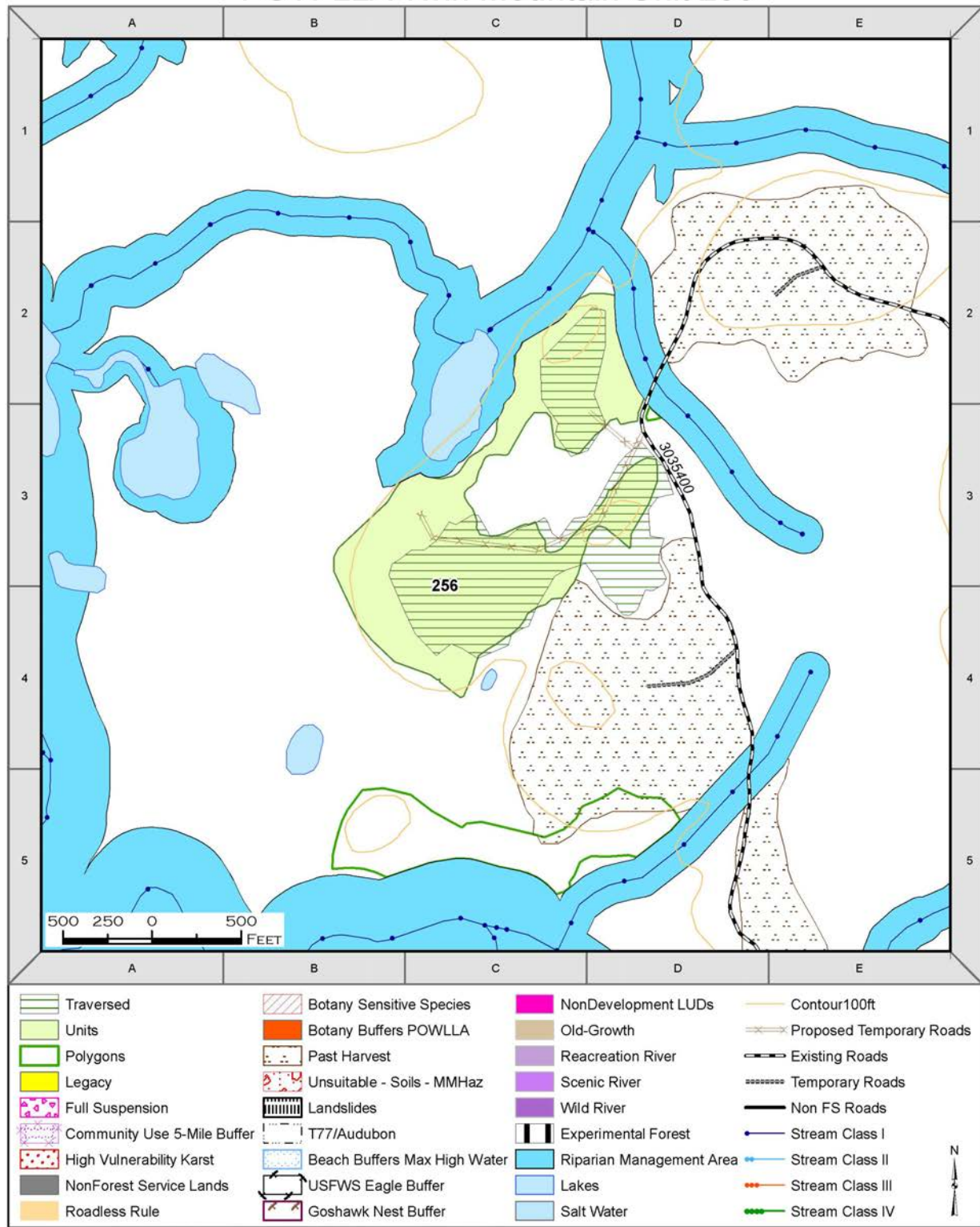
SOILS/WETLANDS

Slopes are gentle to 55%. The soils and wetlands are suitable for shovel yarding and 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). On gentle slopes, follow shovel yarding guidelines outlined in the activity cards and introduction to unit cards (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

May/June goshawk surveys completed: no detections. July/August goshawk surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 256



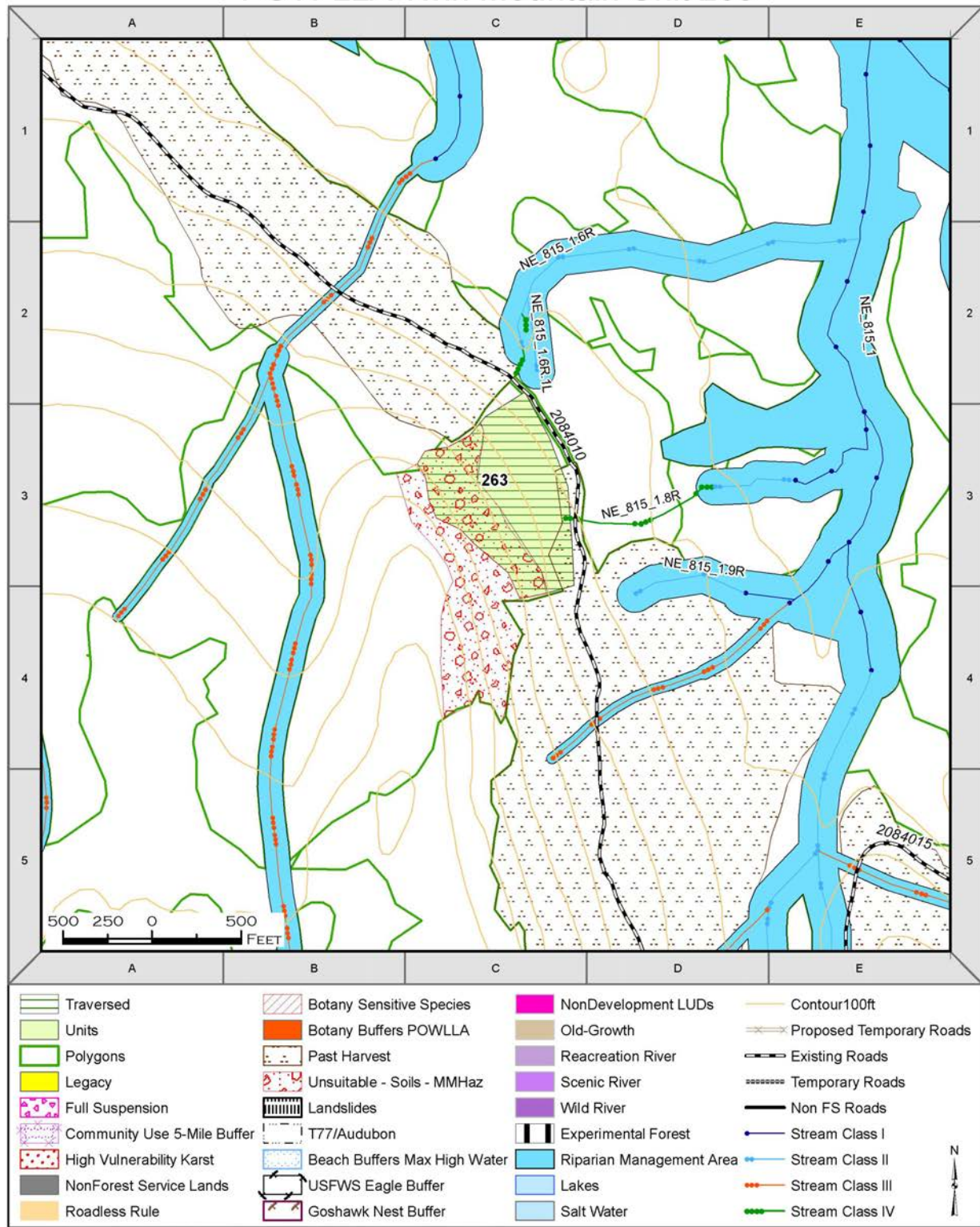
Unit 256						
Unit Number:	256	Total Harvest Unit Acres	24.2	Prescription:	EA	Harvest System: Shovel
VCU Number:	5770	LUD:	Timber Production	Net Harvest Volume (MBF):		480
Summary of Concerns, Responses, BMPs, and Mitigations						
SILVICULTURE						
Old-growth stands of this type are dominated by western 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.						
TIMBER/LOGGING						
This unit is planned for shovel yarding to landings located along two proposed temporary roads off of NFSR 3035400.						
ENGINEERING/SYSTEM ROADS						
Access via existing NFS road 3035400 (BMP 14.20, Road-4, Road-6). New temporary road construction, 0.45 miles (BMPs 14.5, Road-3, Road-5, Road-6).						
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 Activities 13, 19, 23 and 24 in the POWLLA EIS 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					
Stream Num.:	130_2.0					
Stream Class:	I					
Channel Type:	MMO, LCS					
Protection:	Category A					

Unit 256	
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
Concerns:	N/A
Stream Num.:	Map Location C-2
Stream Class:	I
Channel Type:	L
Protection:	Category A
Flagging:	B/W
Buffer (RMA):	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
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 mapped temporary road/stream 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 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 as proposed as of 7/2/19.	
RECREATION	
No recreation concerns, as proposed, as of 09 July 2019.	
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 1.25 acres 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	

Unit 256

May/June goshawk surveys completed-no detections. July/August goshawk surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

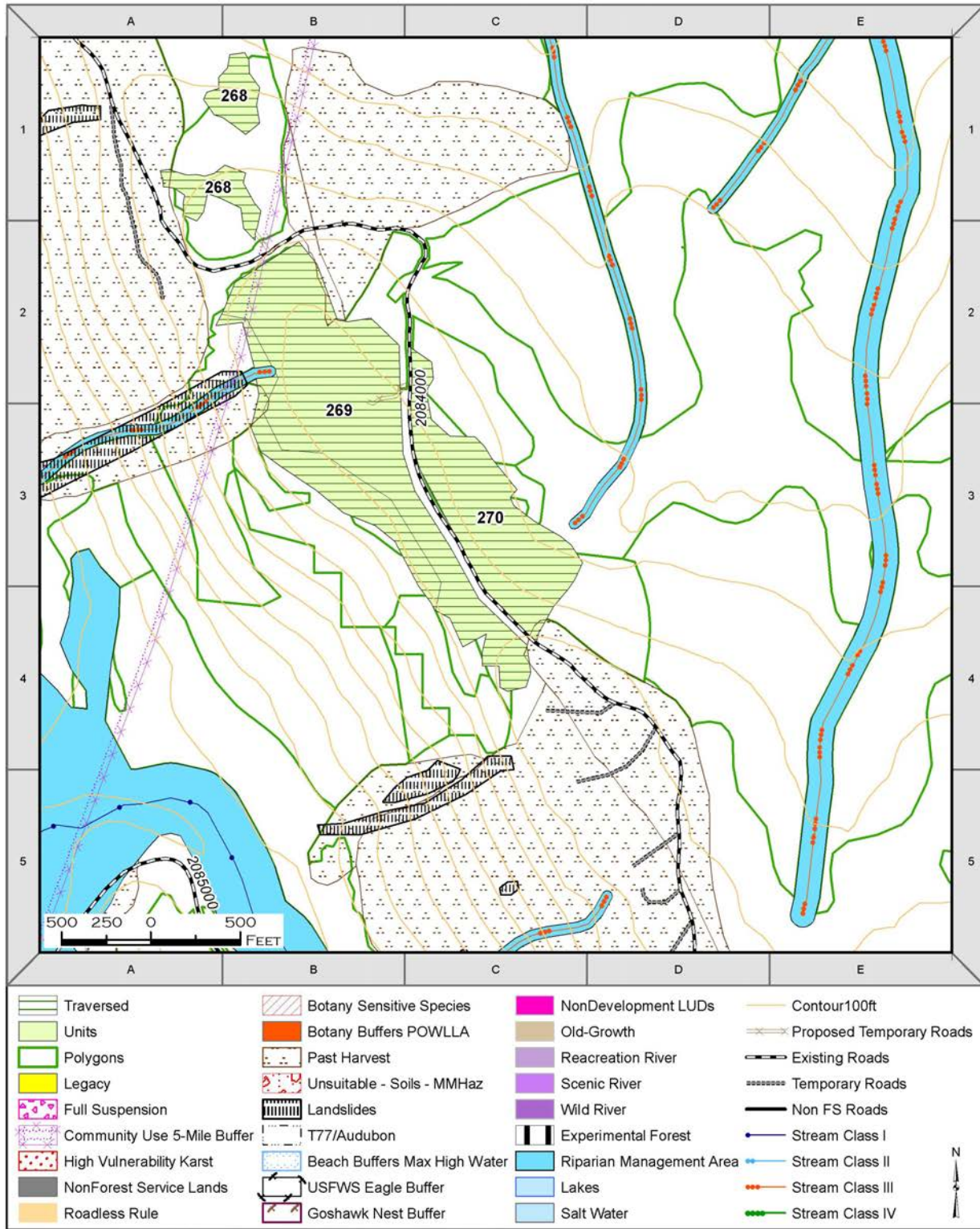
POW LLA Twin Mountain Unit 263



Unit 263						
Unit Number:	263	Total Harvest Unit Acres	8.1	Prescription:	EA	Harvest System: Cable
VCU Number:	5300	LUD:	Modified Landscape		Net Harvest Volume (MBF):	207
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 yarding to landings located along NFSR 2084010.						
ENGINEERING/SYSTEM ROADS						
Access via existing NFS road 2084010 (BMP 14.20, Road-4, Road-6).						
BOTANY						
Unit has not been surveyed due to time constraints. Unit has low probability of having sensitive plants. Unless surveys are conducted to confirm, activities may impact sensitive or rare plant individuals.						
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 POWLLA EIS 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						

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
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 road/stream crossings are anticipated. 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 as proposed as of 7/2/19.
RECREATION
No recreation concerns, as proposed, as of 09 July 2019.
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
May/June goshawk surveys have been completed-no detections. July/August goshawk surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

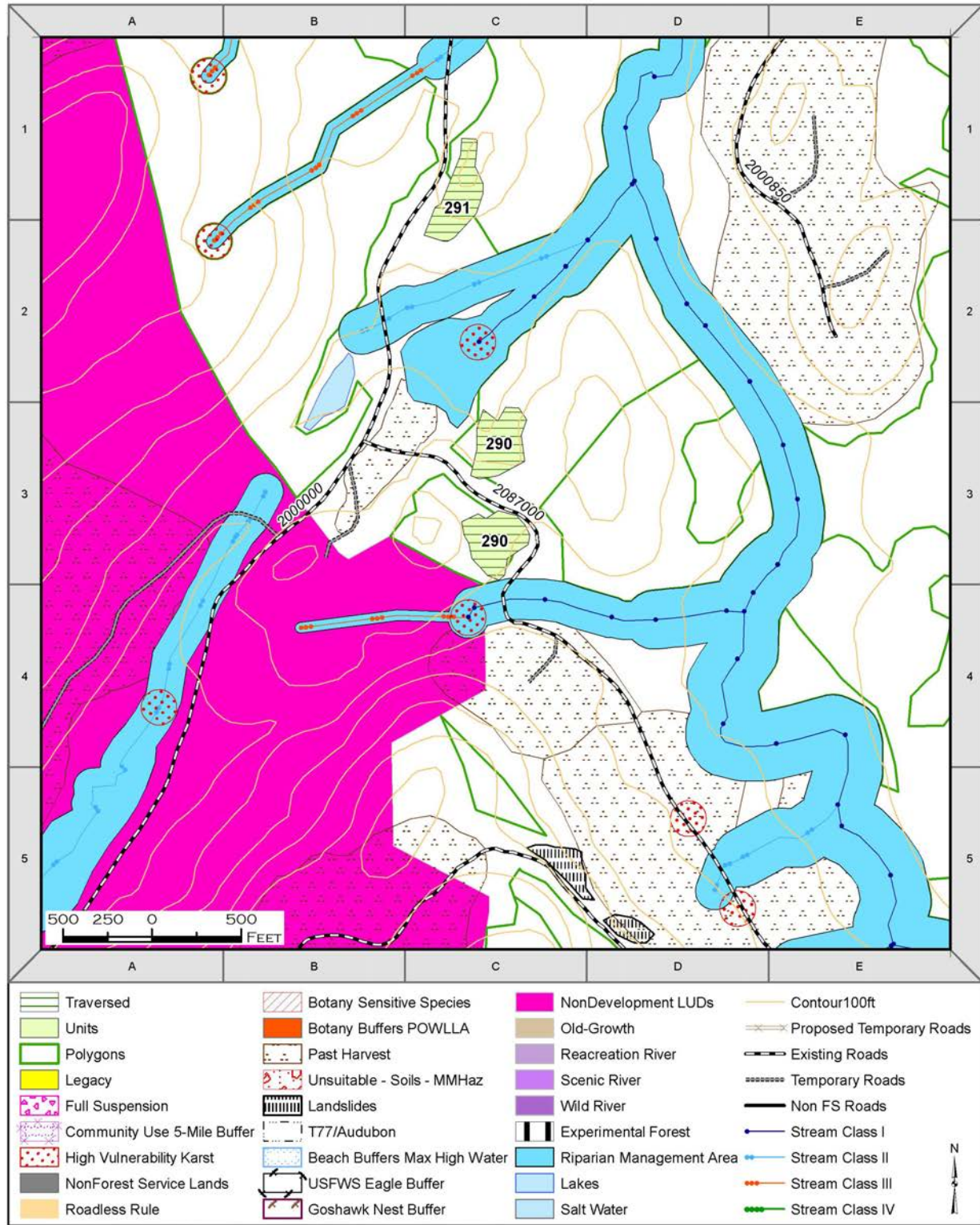
POW LLA Twin Mountain Unit 270



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):		290
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 yarding to landings located along NFSR 2084000.							
ENGINEERING/SYSTEM ROADS							
Access via existing NFS road 2084000 (BMP 14.20, Road-4, Road-6).							
BOTANY							
Unit has not been surveyed due to time constraints. Unit has low probability of having sensitive plants. Unless surveys are conducted to confirm, activities may impact sensitive or rare plant individuals.							
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 Activities 13, 19, 23 and 24 in the POWLLA EIS 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-3						
Stream Class:	III						
Channel Type:	HCDw						
Protection:	Category B						
Flagging:	O/W						
Buffer (RMA)	Class III for HCDw: To the top of the side-slope break						
Concerns:	N/A						
Stream Num.:	Map Location C-4 (not currently mapped)						
Stream Class:	IV						
Channel Type:	HCO						
Protection:	Category C						
Flagging:	G/W						

Unit 270	
Buffer (RMA) Concerns:	Class IV for HCO: No Buffer 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 road/stream crossings are anticipated. 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	
Surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.	
RECREATION	
No recreation concerns, as proposed, as of 09 July 2019.	
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	
May/June goshawk surveys have been completed. July/August goshawk surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.	

POW LLA Twin Mountain Unit 290



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Unit 290							
Unit Number:	290	Total Harvest Unit Acres	4.2	Prescription:	UA	Harvest System:	Shovel
VCU Number:	5290	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 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 low. Old-growth stands tend to already exhibit uneven-aged structure to varying degrees. Uneven-aged management should be designed to create (young growth) or maintain (old growth) multi-aged or multi-layered stand structure. Harvests must be designed so that future entries are not physically or economically isolated and so that tree regeneration is not excessively damaged. Harvests should maintain three or more distinct age classes in a reasonably well dispersed manner across the stand. Harvest openings must also be of sufficient size to allow regeneration of all species. Allow the intermediate age class to develop into mature trees and provide for another economical harvest. This unit has old-growth structure and is located within 5 miles of a subsistence community. Uneven-aged management is required. Group selections will be up to 2 acres in size, between one tree length apart (120 feet) to 200 feet apart in moderate windthrow risk areas or 300 feet apart in high windthrow risk areas and should harvest no more than approximately 33 percent of the stand during any cutting cycle. Harvest openings should be located to balance wildlife needs or meet other objectives (manage windthrow and/or allow for RAW) while creating an economical sale opportunity. Openings must be planned so that opportunities for the next harvest entry are not negatively impacted.							
TIMBER/LOGGING							
This unit is planned for shovel yarding to landings located along NFSR 2087000.							
ENGINEERING/SYSTEM ROADS							
Access via existing NFS road 2087000 (BMP 14.20, Road-4, Road-6).							
BOTANY							
Surveys have not been completed but will be required due to identified potential habitat for sensitive/rare plants within/near this unit. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.							
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 Activities 13, 19, 23 and 24 in the POWLLA EIS 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							
Surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.							
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 290

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 road/stream crossings are known. 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 as proposed as of 7/2/19.

RECREATION

No recreation concerns, as proposed, as of 09 July 2019.

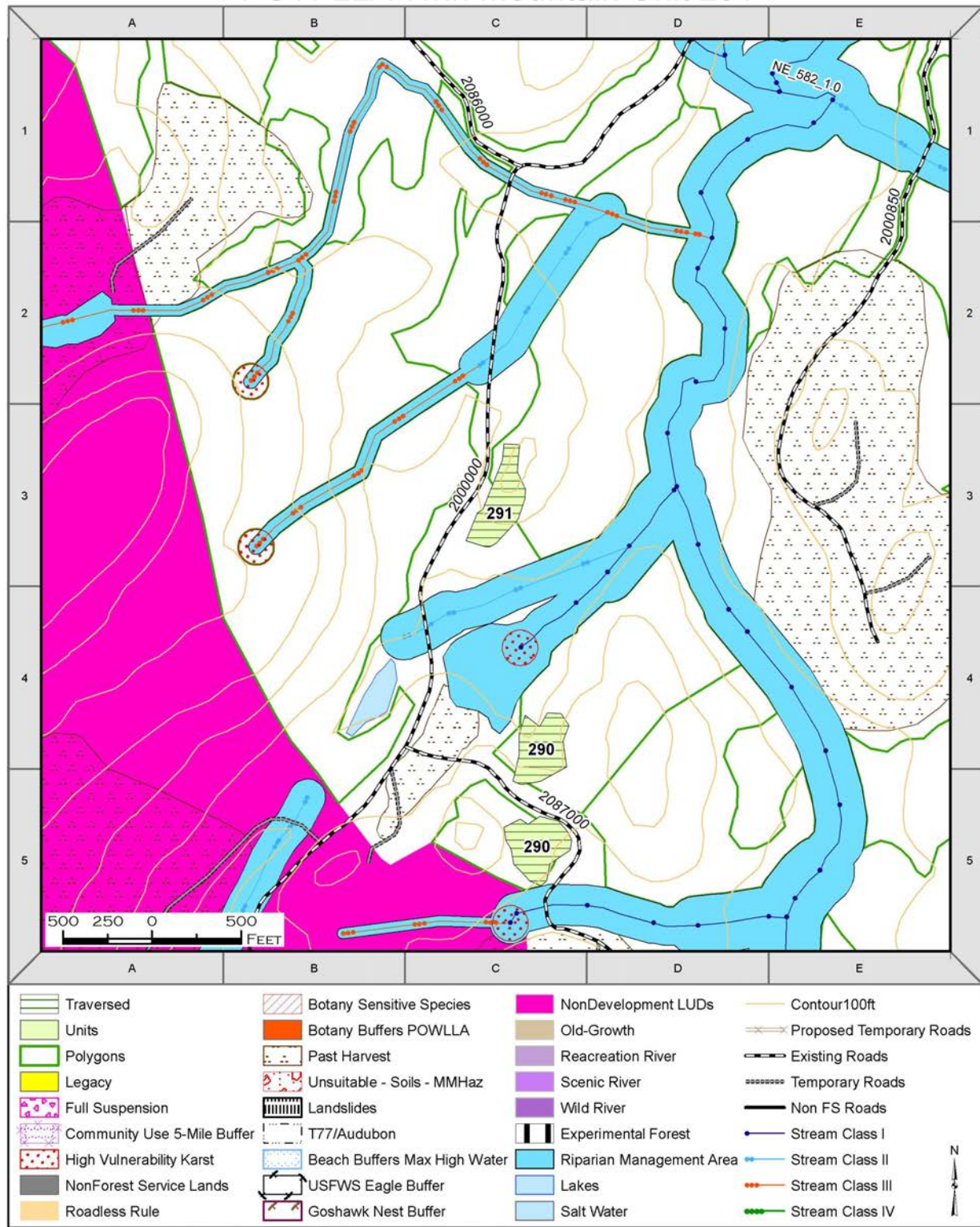
SOILS/WETLANDS

Slopes range from 20 to 120%. All slopes greater than 72% are currently outside of the unit boundary but are suitable for harvest with partial suspension cable yarding. 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).

WILDLIFE

May/June goshawk surveys have been completed. July/August goshawk surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

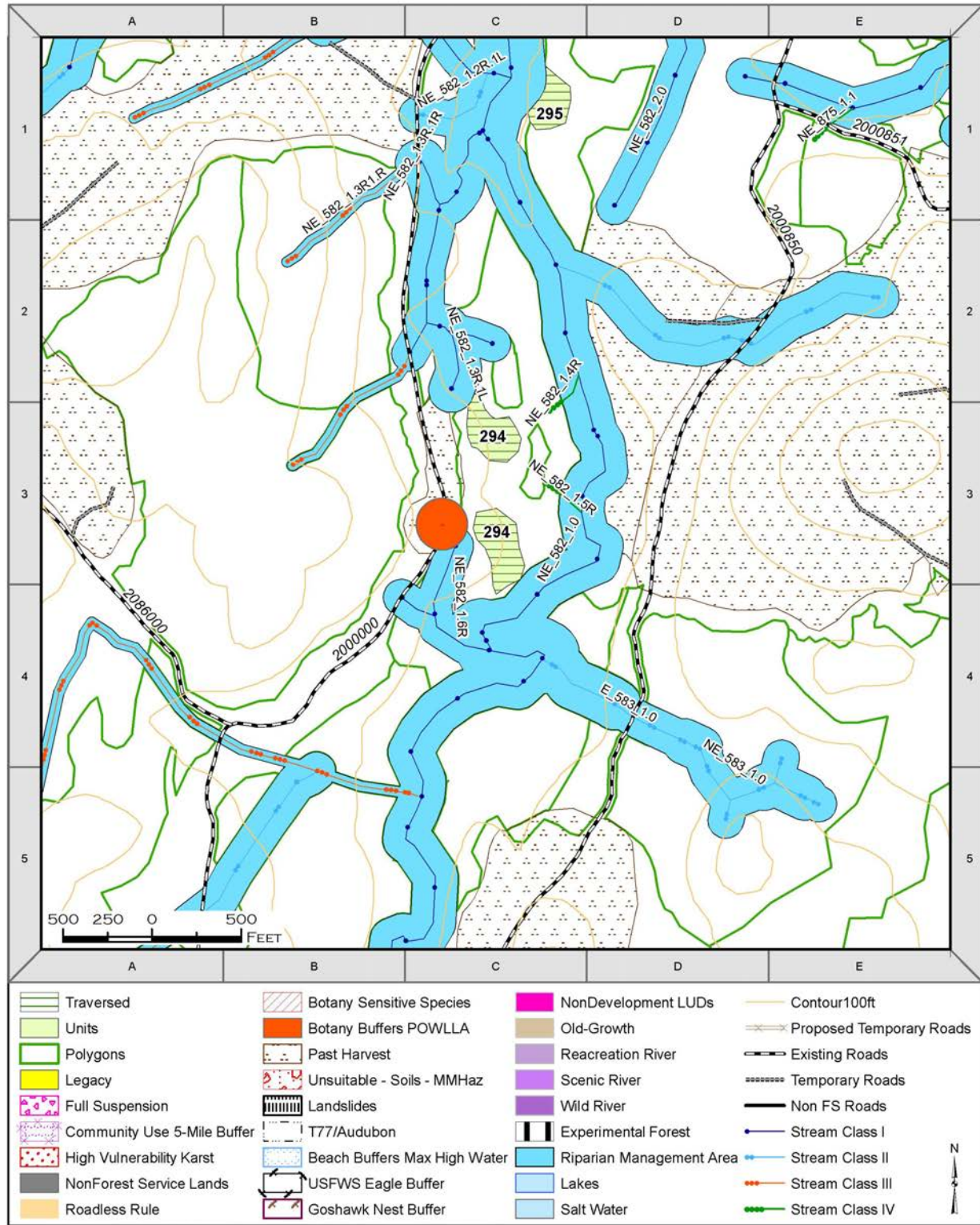
POW LLA Twin Mountain Unit 291



Unit 291							
Unit Number:	291	Total Harvest Unit Acres	2.2	Prescription:	UA	Harvest System:	Shovel
VCU Number:	5290	LUD:	Timber Production		Net Harvest Volume (MBF):		44
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 moderate. The risk for windthrow in this stand is low. Old-growth stands tend to already exhibit uneven-aged structure to varying degrees. Uneven-aged management should be designed to create (young growth) or maintain (old growth) multi-aged or multi-layered stand structure. Harvests must be designed so that future entries are not physically or economically isolated and so that tree regeneration is not excessively damaged. Harvests should maintain three or more distinct age classes in a reasonably well dispersed manner across the stand. Harvest openings must also be of sufficient size to allow regeneration of all species. Allow the intermediate age class to develop into mature trees and provide for another economical harvest. This unit has old-growth structure and is located within 5 miles of a subsistence community. Uneven-aged management is required. Group selections will be up to 2 acres in size, between one tree length apart (120 feet) to 200 feet apart in moderate windthrow risk areas or 300 feet apart in high windthrow risk areas and should harvest no more than approximately 33 percent of the stand during any cutting cycle. Harvest openings should be located to balance wildlife needs or meet other objectives (manage windthrow and/or allow for RAW) while creating an economical sale opportunity. Openings must be planned so that opportunities for the next harvest entry are not negatively impacted.							
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							
Unit has not been surveyed due to time constraints. Unit has low probability of having sensitive plants. Unless surveys are conducted to confirm, activities may impact sensitive or rare plant individuals.							
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 Activities 13, 19, 23 and 24 in the POWLLA EIS 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							
There are currently no mapped streams within 200 feet 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 291
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 road/stream crossings are anticipated. 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 as proposed as of 7/2/19.
RECREATION
No recreation concerns, as proposed, as of 09 July 2019.
SOILS/WETLANDS
Slopes range from 15 to 50% with several benches 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 are dominant in the unit on benches (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4).
WILDLIFE
May/June goshawk surveys complete- no detections. July/August goshawk surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 294



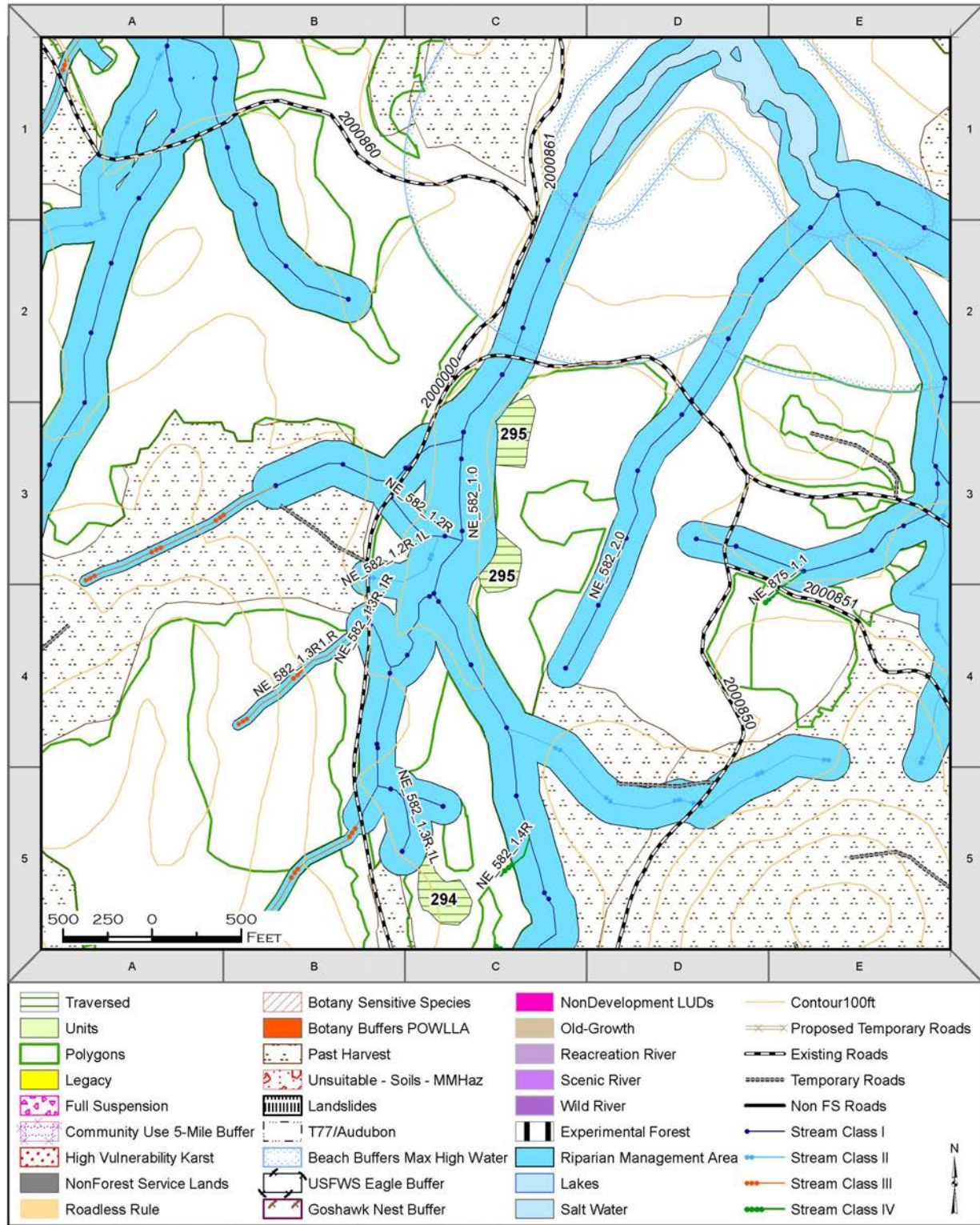
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Unit 294							
Unit Number:	294	Total Harvest Unit Acres	3.6	Prescription:	UA	Harvest System:	Shovel
VCU Number:	5290	LUD:	Timber Production		Net Harvest Volume (MBF):		71
Summary of Concerns, Responses, BMPs, and Mitigations							
SILVICULTURE							
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 heavy 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. The risk for windthrow in this stand is high due to its exposure to southeasterly winds and the existing stand and site characteristics. Old-growth stands tend to already exhibit uneven-aged structure to varying degrees. Uneven-aged management in old-growth stands should be designed to maintain multi-aged or multi-layered stand structure. Harvests must be designed so that future entries are not physically or economically isolated and so that tree regeneration is not excessively damaged. Harvests should maintain three or more distinct age classes in a reasonably well dispersed manner across the stand. Harvest openings must also be of sufficient size to allow regeneration of all species. Allow the intermediate age class to develop into mature trees and provide for another economical harvest. This unit lies within a 5-mile community buffer and requires the use of uneven-aged management. Group selections should harvest no more than 1/3 of the acres of the unit with no more than 2-acre openings. Harvest openings should be located to balance wildlife needs or meet other objectives (manage windthrow and/or allow for RAW) while creating an economical sale opportunity. Openings must be planned so that opportunities for the next harvest entry are not forfeited.							
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). The rock quarry adjacent to unit 294 at milepost 126.6 on road 2000000 is off limits to development for a botany buffer.							
BOTANY							
One population, comprised of 15 plants, of <i>Cypripedium parviflorum</i> var. <i>pubescens</i> (large yellow lady's slipper) is known within 200 ft of the harvest area of this unit. Mitigation measures for this sensitive plant include avoidance with a 150 ft (or more) buffer around the population. This will ensure the associated habitat for the plant population is not inadvertently disturbed with road reconstruction or resurfacing or from habitat disturbance associated with timber removal. See Forest Plan components for Botany (PLA1.III) and Appendix 1 of the POWLLA EIS (Activity Cards 13, 23, and 24 under Botany).							
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 POWLLA EIS 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.:	582_1.0						
Stream Class:	I						
Channel Type:	LCM, FPM						
Protection:	Category A						
Flagging:	B/W						
Buffer (RMA):							
Class I for LCM: 100 feet or to the top of the side-slope break; whichever is greater.							
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:	Moderate blowdown						

Unit 294	
Stream Num.:	582_1.3R.1L.1R
Stream Class:	I
Channel Type:	MMO
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:	Moderate blowdown
Stream Num.:	582_1.6R
Stream Class:	I
Channel Type:	HCO, MMO, 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.	
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:	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	
No temporary road/stream crossings are known. 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 as proposed as of 7/2/19.	
RECREATION	
No recreation concerns, as proposed, as of 09 July 2019.	
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 are intermixed in the unit (R10 BMP 12.5 and National Core	

Unit 294
BMPs AqEco-2 and AqEco-4). The temporary road location will reviewed prior to implementation. Follow R10 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
May/June goshawk surveys have been completed- no detections. July/August goshawk surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 295

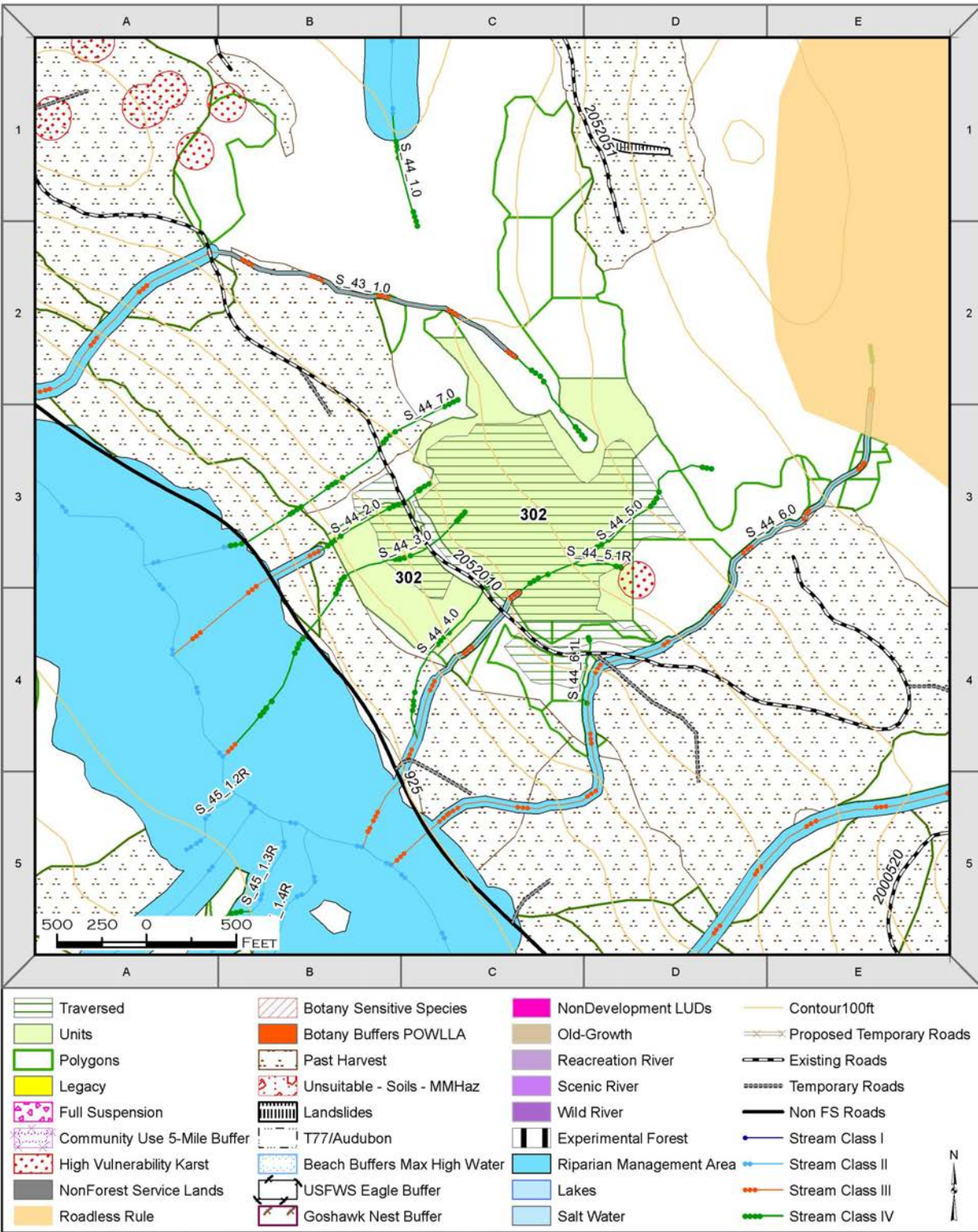


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Unit 295						
Unit Number:	295	Total Harvest Unit Acres	4	Prescription:	UA	Harvest System: Shovel
VCU Number:	5290	LUD:	Timber Production	Net Harvest Volume (MBF):		81
Summary of Concerns, Responses, BMPs, and Mitigations						
SILVICULTURE						
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 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 winds coming off nearby muskegs and past harvest, and due to existing stand and site characteristics. Old-growth stands tend to already exhibit uneven-aged structure to varying degrees. Uneven-aged management should be designed to create (young growth) or maintain (old growth) multi-aged or multi-layered stand structure. Harvests must be designed so that future entries are not physically or economically isolated and so that tree regeneration is not excessively damaged. Harvests should maintain three or more distinct age classes in a reasonably well dispersed manner across the stand. Harvest openings must also be of sufficient size to allow regeneration of all species. Allow the intermediate age class to develop into mature trees and provide for another economical harvest. This unit has old-growth structure and is located within 5 miles of a subsistence community. Uneven-aged management is required. Group selections will be up to 2 acres in size, between one tree length apart (120 feet) to 200 feet apart in moderate windthrow risk areas or 300 feet apart in high windthrow risk areas and should harvest no more than approximately 33 percent of the stand during any cutting cycle. Harvest openings should be located to balance wildlife needs or meet other objectives (manage windthrow and/or allow for RAW) while creating an economical sale opportunity. Openings must be planned so that opportunities for the next harvest entry are not negatively impacted.						
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						
Unit has not been surveyed due to time constraints. Unit has low probability of having sensitive plants. Unless surveys are conducted to confirm, activities may impact sensitive or rare plant individuals.						
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 POWLLA EIS 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.:	582_1.0					
Stream Class:	I					
Channel Type:	LCM					
Protection:	Category A					
Flagging:	B/W					
Buffer (RMA):						
Class I for LCM:	100 feet or to the top of the side-slope break; whichever is greater.					
Concerns:	N/A					
Stream Num.:	582_2.0					
Stream Class:	I					
Channel Type:	PAO					
Protection:	Category A					

Unit 295	
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
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 road/stream crossings are known. 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 as proposed as of 7/2/19.	
RECREATION	
No recreation concerns, as proposed, as of 09 July 2019.	
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). Temporary road access will be reviewed prior to implementation. Follow R10 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.	
WILDLIFE	
May/June goshawk surveys have been completed-no detections. July/August goshawk surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.	

POW LLA Twin Mountain Unit 302



Unit 302							
Unit Number:	302	Total Harvest Unit Acres	32.1	Prescription:	EA	Harvest System:	Cable
VCU Number:	5880	LUD:	Timber Production		Net Harvest Volume (MBF):		640
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 planned harvest unit is greater than 20 acres in size, legacy retention will be implemented to meet this requirement (Forest Plan, page 4-68).							
TIMBER/LOGGING							
This unit is planned for cable yarding to landings located off of NFSR 2052010.							
ENGINEERING/SYSTEM ROADS							
Access via existing NFS road 2052010 (BMP 14.20, Road-4, Road-6).							
BOTANY							
Surveys have not been completed but will be required due to identified potential habitat for sensitive/rare plants within/near this unit. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.							
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 Activities 13, 19, 23 and 24 in the POWLLA EIS 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.:	43_2.0						
Stream Class:	IV						
Channel Type:	HCO						
Protection:	Category C						

Unit 302

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

Stream Num.: 43_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.: 43_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.: 43_5.0
 Stream Class: III, IV
 Channel Type: HCO
 Protection: Category B, C
 Flagging: O/W, G/W
 Buffer (RMA): Yes
 Concerns: Class III for HCO: To the top of the side-slope break; Class IV for HCO: No buffer

Stream Num.: 43_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.: 43_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 IV for HCO: No buffer
 Concerns: N/A

Stream Num.: 43_6.1L
 Stream Class: IV
 Channel Type: MCO
 Protection: Category C
 Flagging: G/W
 Buffer (RMA): Class IV for MCO: No buffer
 Concerns: N/A

Stream Num.: 43_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

Unit 302

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 road/stream crossings are anticipated. 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. Two significant karst features and the streams that flows to them have been buffered. 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

Surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

RECREATION

No recreation concerns, as proposed, as of 09 July 2019.

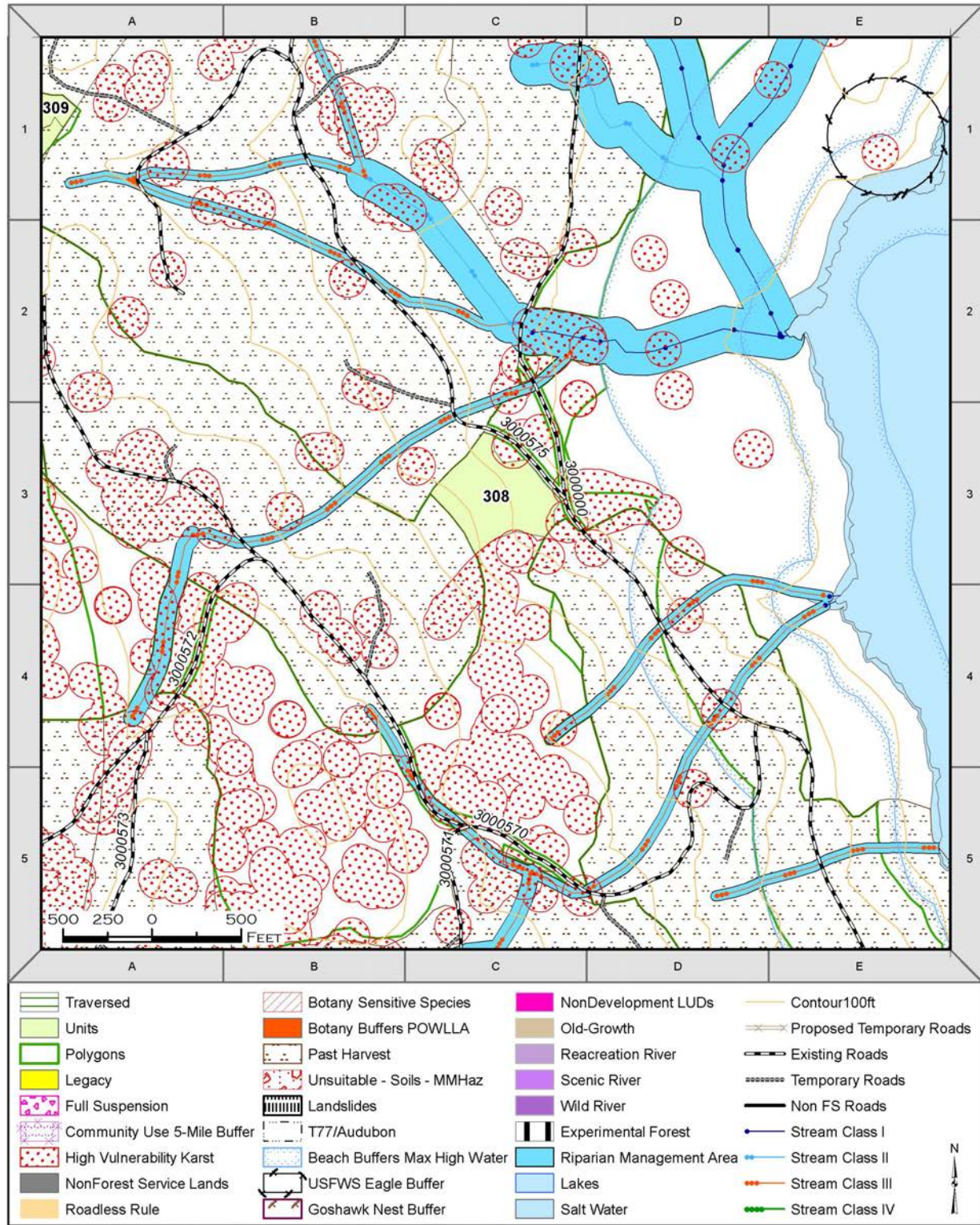
SOILS/WETLANDS

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 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). 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).

WILDLIFE

May/June goshawk surveys have been completed-no detections. July/August goshawk surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 308



Unit 308						
Unit Number:	308	Total Harvest Unit Acres	6.1	Prescription:	EA	Harvest System: Cable
VCU Number:	5390	LUD:	Modified Landscape		Net Harvest Volume (MBF):	120
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 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. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. However, the planned harvest unit is less than 20 acres in size which eliminates this requirement (Forest Plan, page 4-68).						
TIMBER/LOGGING						
This unit is planned for downhill yarding to landings located along NFSR 3000575.						
ENGINEERING/SYSTEM ROADS						
Access via existing NFS road 3000575 (BMP 14.20, Road-4, Road-6).						
BOTANY						
No botany concerns.						
INVASIVE SPECIES						
Weeds are in the area of the unit along NFSR 3000575. 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 POWLLA EIS 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.:	715_1.0 (Map Location C-3 & D-3, not currently mapped)					
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:	Karst					
Stream Num.:	715_2.0 (Map Location C-2 & 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					

Unit 308

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 road/stream crossings are anticipated. 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. The entire unit is underlain by karst. Karst development in the unit is intense, most of the area has been found to be of high vulnerability surrounding multiple, discrete karst features. Epikarst is well developed throughout the unit. Karst lands in-between discrete features and their buffers is considered 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 as proposed as of 7/8/19.

RECREATION

No recreation concerns, as proposed, as of 09 July 2019.

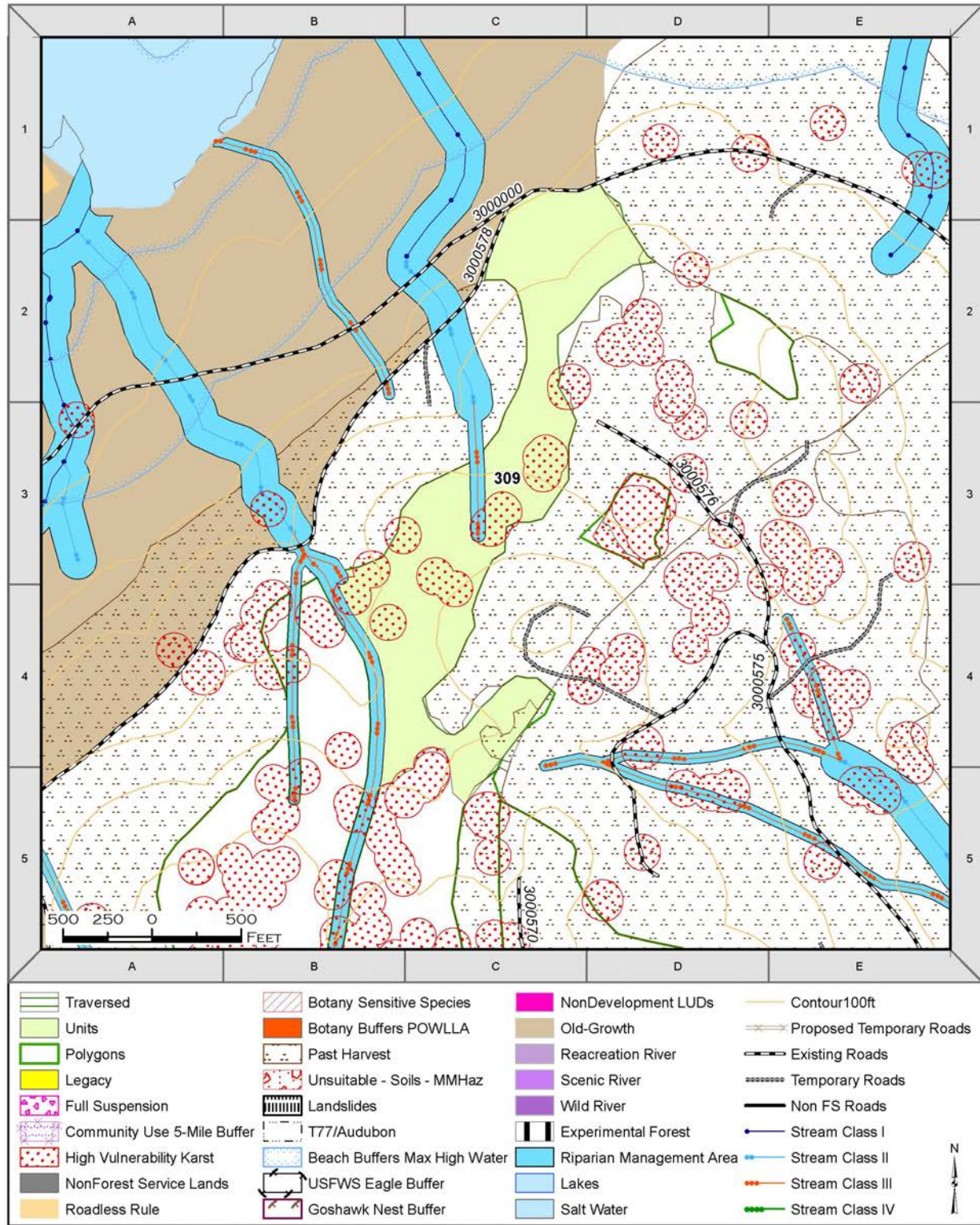
SOILS/WETLANDS

Slopes range from 20 to 110%. About one acre of slopes >72% occur on the southern portion of the unit and are suitable with partial suspension. Partial suspension cable yarding will meet soil and wetland resource concerns within the unit (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 from the road to the steep slopes (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4).

WILDLIFE

May/June goshawk surveys completed-no detections. July/August goshawk surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 309

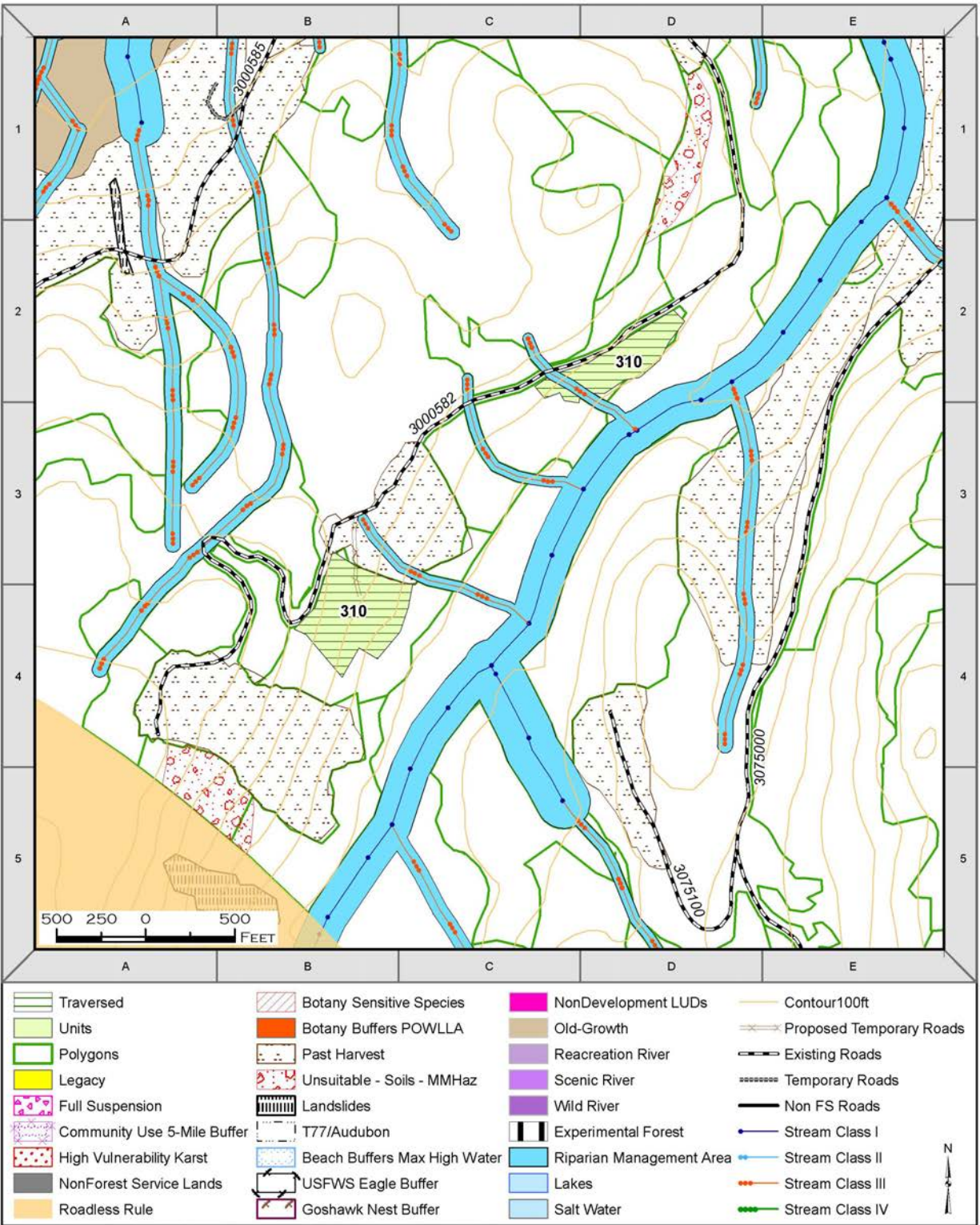


Unit 309							
Unit Number:	309	Total Harvest Unit Acres	41.1	Prescription:	EA	Harvest System:	Shovel
VCU Number:	5350	LUD:	Modified Landscape		Net Harvest Volume (MBF):		800
Summary of Concerns, Responses, BMPs, and Mitigations							
SILVICULTURE							
Old-growth stands of this type are dominated 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 heavy throughout the stand and present in both the overstory and understory. The risk for windthrow in this stand is high due to its open exposure to Sumner Strait and northwesterly 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. A RAW review was needed for a Class III stream in the very southwestern corner of the unit, but an additional buffer was determined to be unnecessary after field review by a team of specialists. This unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. Because the planned harvest unit is greater than 20 acres in size, legacy retention will be implemented to meet this requirement (Forest Plan, page 4-68).							
TIMBER/LOGGING							
This unit is planned for shovel yarding to landings located along proposed temporary roads off of NFSR 3000575 and NFSR 3000576.							
ENGINEERING/SYSTEM ROADS							
Access via existing NFS road 3000575 (BMP 14.20, Road-4, Road-6).							
BOTANY							
No botany concerns.							
INVASIVE SPECIES							
Weeds are in the area of the unit along NFSR 3000000 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 POWLLA EIS 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.:	716_1.0 (Map Location B-4)						
Stream Class:	III, IV						
Channel Type:	HCMk, HCOk, HCO						
Protection:	Category B, C						
Flagging:	O/W, G/W						
Buffer (RMA):	Class III for HCMk: To the top of the side-slope break; Class IV with Category B protection for HCOk: To the top of the side-slope break; Class IV for HCO: No buffer Yes						
Concerns:	Karst and blowdown						

Unit 309	
Stream Num.:	716_1.1L (Map Location B-4)
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.:	716_2.0 (Map Location C-2 & C-3)
Stream Class:	II, IV
Channel Type:	HCL, HCO
Protection:	Category A, 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 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 road/stream crossings are anticipated. 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. The entire unit is underlain by karst. Karst development in the unit is intense, most of the area has been found to be of high vulnerability surrounding multiple, discrete karst features. Epikarst is well developed throughout the unit. Karst lands in-between discrete features and their buffers is considered 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	
Surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.	
RECREATION	
No recreation concerns, as proposed, as of 09 July 2019.	
SOILS/WETLANDS	
Slopes range from 5 to 65%. The soils and wetlands are suitable for shovel yarding. There are a few sensitive locations in the unit that have evidence of saturated hollows and slumps on 40% or greater slopes with glacial till soils. Keep the shovel tracks and puncheon away from these areas. 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,	

Unit 309
and Veg-4). Forested wetlands intermittent within the unit (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4).
WILDLIFE
May/June goshawk surveys have been completed: no detections. July/August goshawk surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

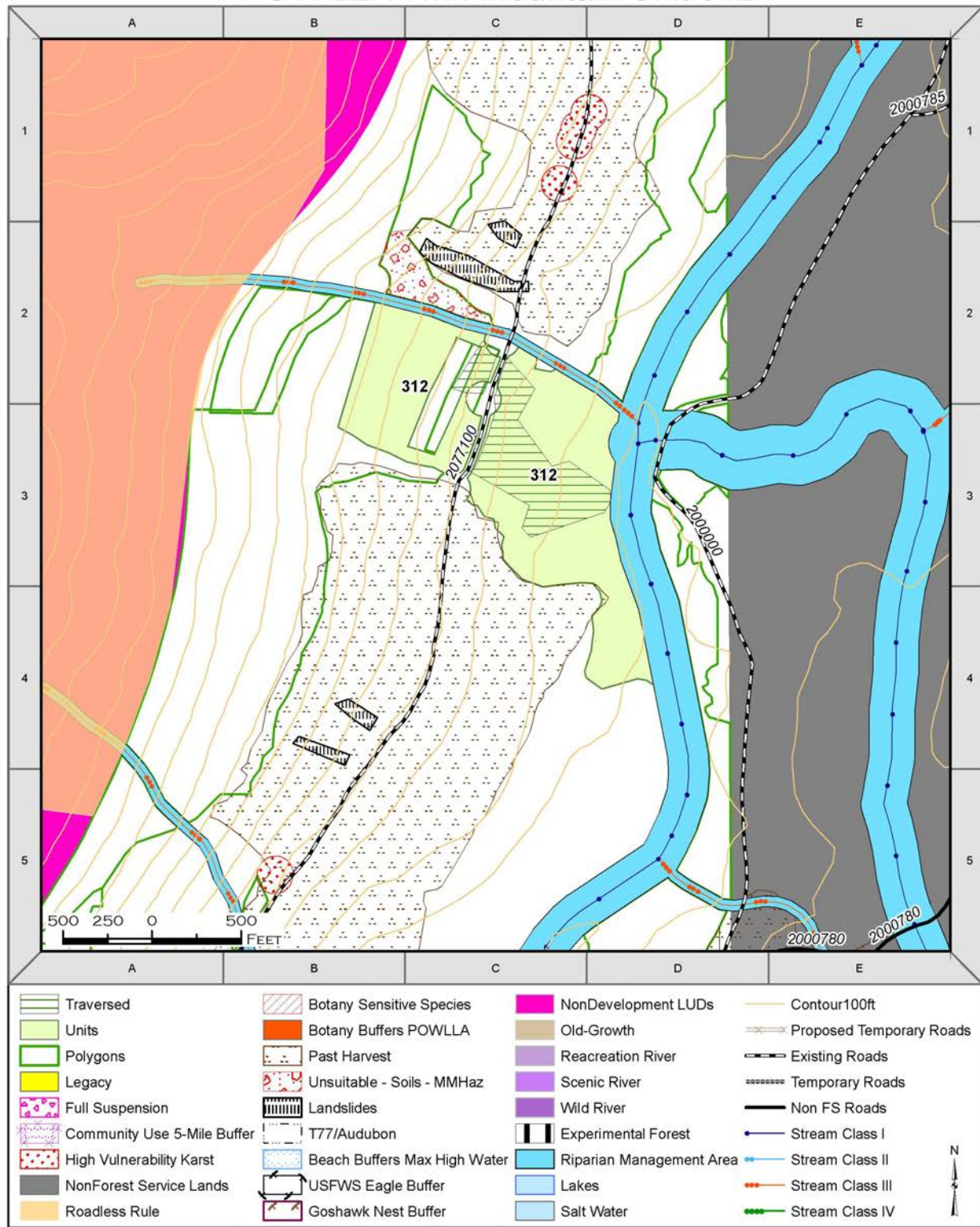
POW LLA Twin Mountain Unit 310



Unit 310							
Unit Number:	310	Total Harvest Unit Acres	9.2	Prescription:	EA	Harvest System:	Shovel, Cable
VCU Number:	5350	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 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. However, the planned harvest unit is less than 20 acres in size which eliminates 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 a combination of shovel and uphill yarding to landings located along a proposed temporary spur road and off of NFSR 3000582.							
ENGINEERING/SYSTEM ROADS							
Access via existing NFS road 3000582 (BMP 14.20, Road-4, Road-6). New temporary road construction, 0.10 miles (BMPs 14.5, Road-3, Road-5, Road-6).							
BOTANY							
Unit has not been surveyed due to time constraints. Unit has low probability of having sensitive plants. Unless surveys are conducted to confirm, activities may impact sensitive or rare plant individuals.							
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 Activities 13, 19, 23 and 24 in the POWLLA EIS 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.:	724_1.0 (Map Location D-2, C-3, C-4, & B-4)						
Stream Class:	I						
Channel Type:	MCS, FPS						
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; 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						
Concerns:	N/A						
Stream Num.:	724_1.1R (Map Location D-3 & C-3)						

Unit 310	
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 road/stream crossings are anticipated. 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 as proposed as of 7/5/19.	
RECREATION	
No recreation concerns, as proposed, as of 09 July 2019.	
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). 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 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 constraints with steep ground, 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	
May/June goshawk surveys have been completed: no detections. July/August goshawk surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.	

POW LLA Twin Mountain Unit 312

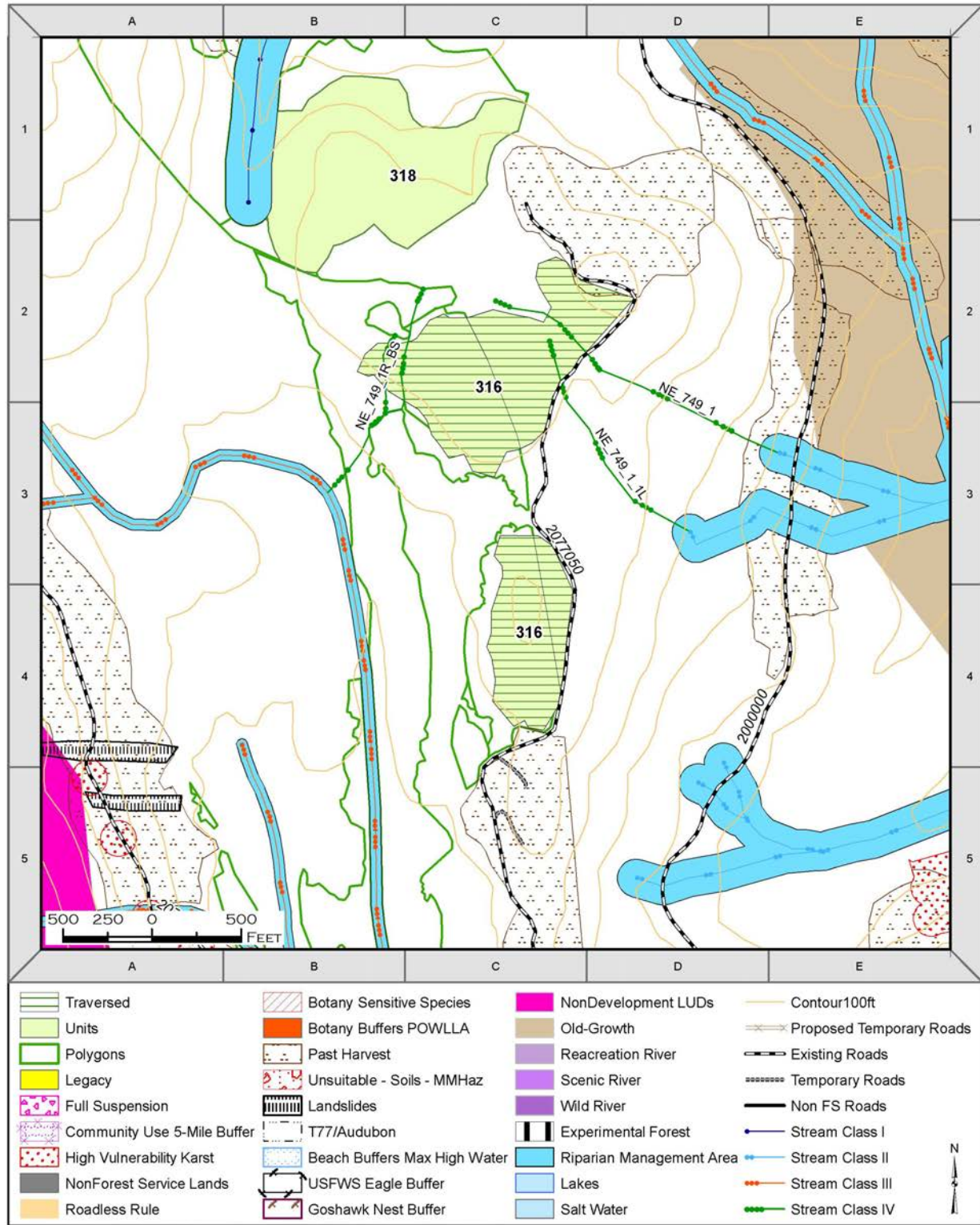


Unit 312							
Unit Number:	312	Total Harvest Unit Acres	8.1	Prescription:	EA	Harvest System:	Shovel
VCU Number:	5371	LUD:	Timber Production		Net Harvest Volume (MBF):		160
Summary of Concerns, Responses, BMPs, and Mitigations							
SILVICULTURE							
Old-growth stands of this type are dominated by 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. However, the planned harvest unit is less than 20 acres in size which eliminates this requirement (Forest Plan, page 4-68).							
TIMBER/LOGGING							
This unit is planned for shovel yarding to landings located along NFSR 2077100.							
ENGINEERING/SYSTEM ROADS							
Access via existing NFS road 2077100 (BMP 14.20, Road-4, Road-6).							
BOTANY							
Unit has not been surveyed due to time constraints. Unit has low probability of having sensitive plants. Unless surveys are conducted to confirm, activities may impact sensitive or rare plant individuals.							
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 Activities 13, 19, 23 and 24 in the POWLLA EIS 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 (Map Location D-3)						
Stream Class:	I						
Channel Type:	MCM, FPM						
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 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 (Map Location D-3 & C-3, not currently mapped)						
Stream Class:	I, II, IV						
Channel Type:	HCM, HCD						

Unit 312	
Protection:	Category A, 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_1.3L (Map Location D-3 & C-2, not currently mapped)
Stream Class:	I, IV
Channel Type:	HCO
Protection:	Category A, 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 (Map Location C-3 & C-2, not currently mapped)
Stream Class:	I, IV
Channel Type:	HCO
Protection:	Category A, 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_1.4L (Map Location D-3 & C-2)
Stream Class:	I, III
Channel Type:	HCO
Protection:	Category A, 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.	
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 road/stream crossings are anticipated. 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 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	

Unit 312
the vicinity of the discovery shall cease and reasonable efforts shall be taken to avoid or minimize harm to the resource.
SCENERY
Surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.
RECREATION
No recreation concerns, as proposed, as of 09 July 2019.
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). 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 on the gentle slopes (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4).
WILDLIFE
May/June goshawk surveys not completed. July/August goshawk surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 316



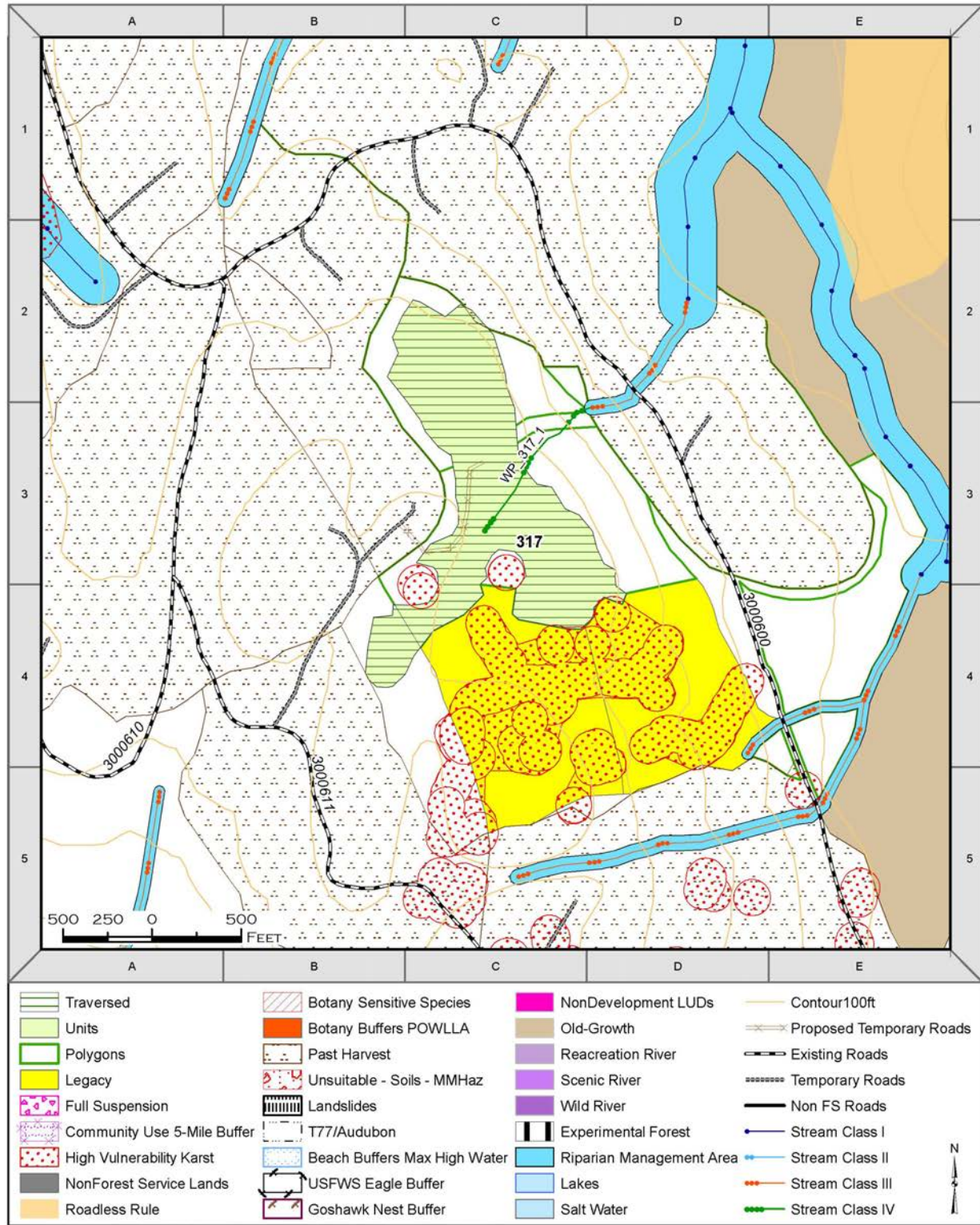
Unit 316						
Unit Number:	316	Total Harvest Unit Acres	16.8	Prescription:	EA	Harvest System: Shovel
VCU Number:	5340, 5371	LUD:	Timber Production	Net Harvest Volume (MBF):		428
Summary of Concerns, Responses, BMPs, and Mitigations						
SILVICULTURE						
Old-growth stands of this type are dominated 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. However, this part of the planned harvest unit is less than 20 acres in size which eliminates this requirement (Forest Plan, page 4-68).						
TIMBER/LOGGING						
This unit is planned for shovel and uphill yarding to landings located along two proposed temporary spur roads and off of NFSR 2077050.						
ENGINEERING/SYSTEM ROADS						
Access via existing NFS road 2077050 (BMP 14.20, Road-4, Road-6).						
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 Activities 13, 19, 23 and 24 in the POWLLA EIS 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.:	NE_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.:	NE_749_1_1L					
Stream Class:	IV					
Channel Type:	HCO					
Protection:	Category C					
Flagging:	G/W					

Unit 316	
Buffer (RMA):	Class IV for HCO: No Buffer
Concerns:	N/A
Stream Num.:	NE_749_1R_BS
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.:	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	
No temporary road/stream crossings are anticipated. 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 as proposed as of 7/2/19.	
RECREATION	
No recreation concerns, as proposed, as of 09 July 2019.	
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).	
WILDLIFE	
May/June goshawk surveys have been completed: no detections. July/August surveys have not been completed.	

Unit 316

All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 317



Unit 317						
Unit Number:	317	Total Harvest Unit Acres	25.8	Prescription:	EA	Harvest System: Shovel
VCU Number:	5340, 5350	LUD:	Timber Production	Net Harvest Volume (MBF):		711
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 mostly lies within a VCU requiring legacy retention for most even-aged management prescriptions. Because the planned harvest unit is greater than 20 acres in size, legacy retention will be implemented 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 NFSR 3000611.						
ENGINEERING/SYSTEM ROADS						
Access via existing NFS road 3000611 (BMP 14.20, Road-4, 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 POWLLA EIS 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.:	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 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 317

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 road/stream crossings are anticipated. 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. 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 as proposed as of 7/2/19.

RECREATION

No recreation concerns, as proposed, as of 09 July 2019.

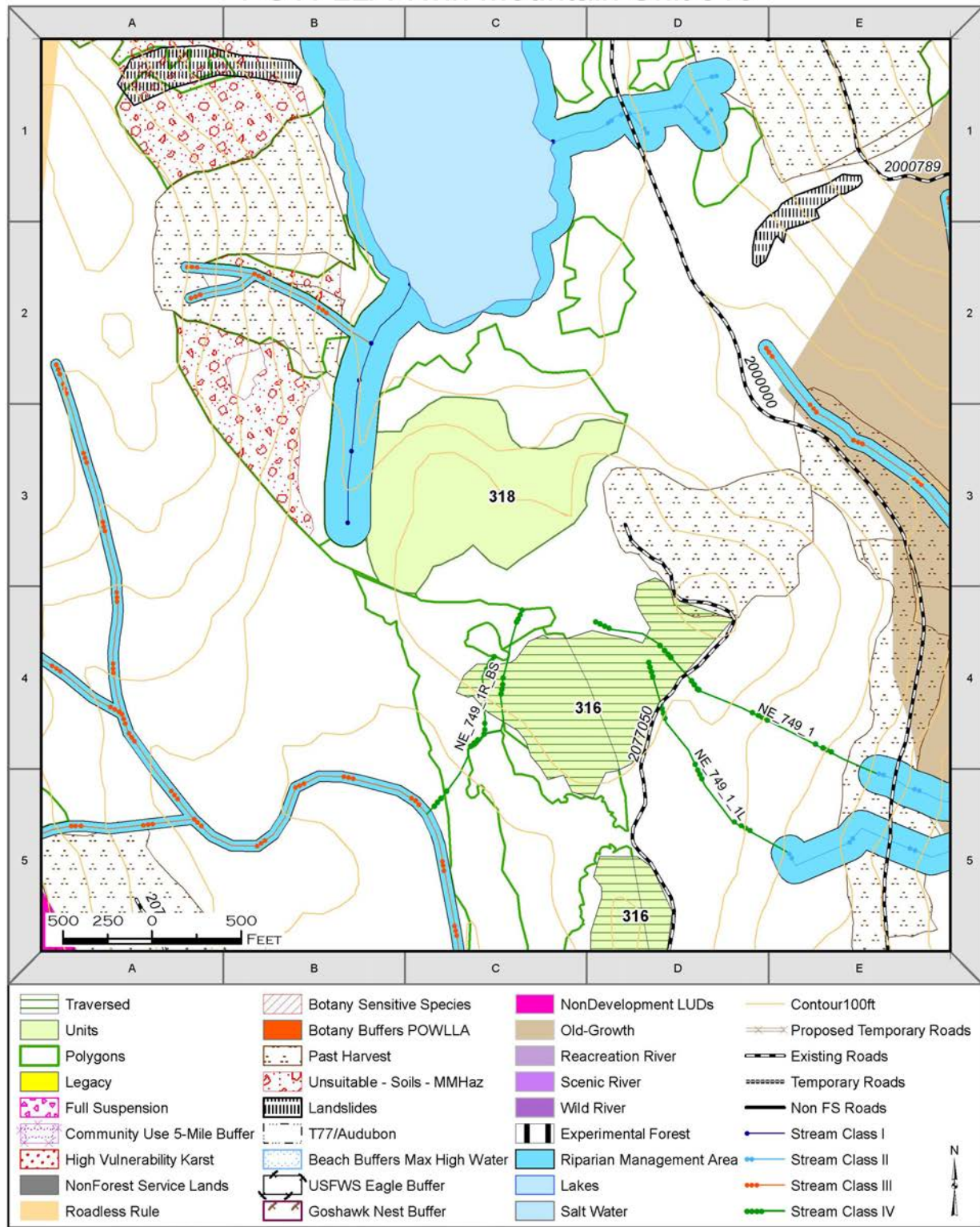
SOILS/WETLANDS

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 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.

WILDLIFE

May/June goshawk surveys have been completed: no detections. July/August goshawk surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 318



Unit 318						
Unit Number:	318	Total Harvest Unit Acres	22.3	Prescription:	EA	Harvest System: Cable
VCU Number:	5330	LUD:	Timber Production	Net Harvest Volume (MBF):		400
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.						
TIMBER/LOGGING						
This unit is planned for uphill yarding to landings located along a proposed temporary road off of NFSR 2077050.						
ENGINEERING/SYSTEM ROADS						
Access via existing NFS road 2077050 (BMP 14.20, Road-4, Road-6).						
BOTANY						
Unit has not been surveyed due to time constraints. Unit has low probability of having sensitive plants. Unless surveys are conducted to confirm, activities may impact sensitive or rare plant individuals.						
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 Activities 13, 19, 23 and 24 in the POWLLA EIS 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 (Map Location C-3 & C-2, not currently mapped)					
Stream Class:	II, IV					
Channel Type:	HCM, HCO					
Protection:	Category A, C					
Flagging:	B/W, G/W					
Buffer (RMA):	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 (Map Location C-3 & C-2, not currently mapped)					
Stream Class:	IV					
Channel Type:	HCM, HCO					
Protection:	Category B, C					
Flagging:	O/W, G/W					

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Buffer (RMA): Class IV for HCM with Category B Protection: To the top of the side-slope break. Class IV for HCO: No buffer
Concerns: N/A

Stream Num.: 773_2.0 (Map Location B-3)

Stream Class: II, IV

Channel Type: PAB, HCM, HCO

Protection: Category A, C

Flagging: B/W, G/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. Class II for HCM: 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.: 773_2.1L (Map Location B-3 & C-3, not currently mapped)

Stream Class: II, IV

Channel Type: HCO

Protection: Category A, 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 temporary road/stream crossings are anticipated. 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 as proposed as of 7/5/19.

RECREATION

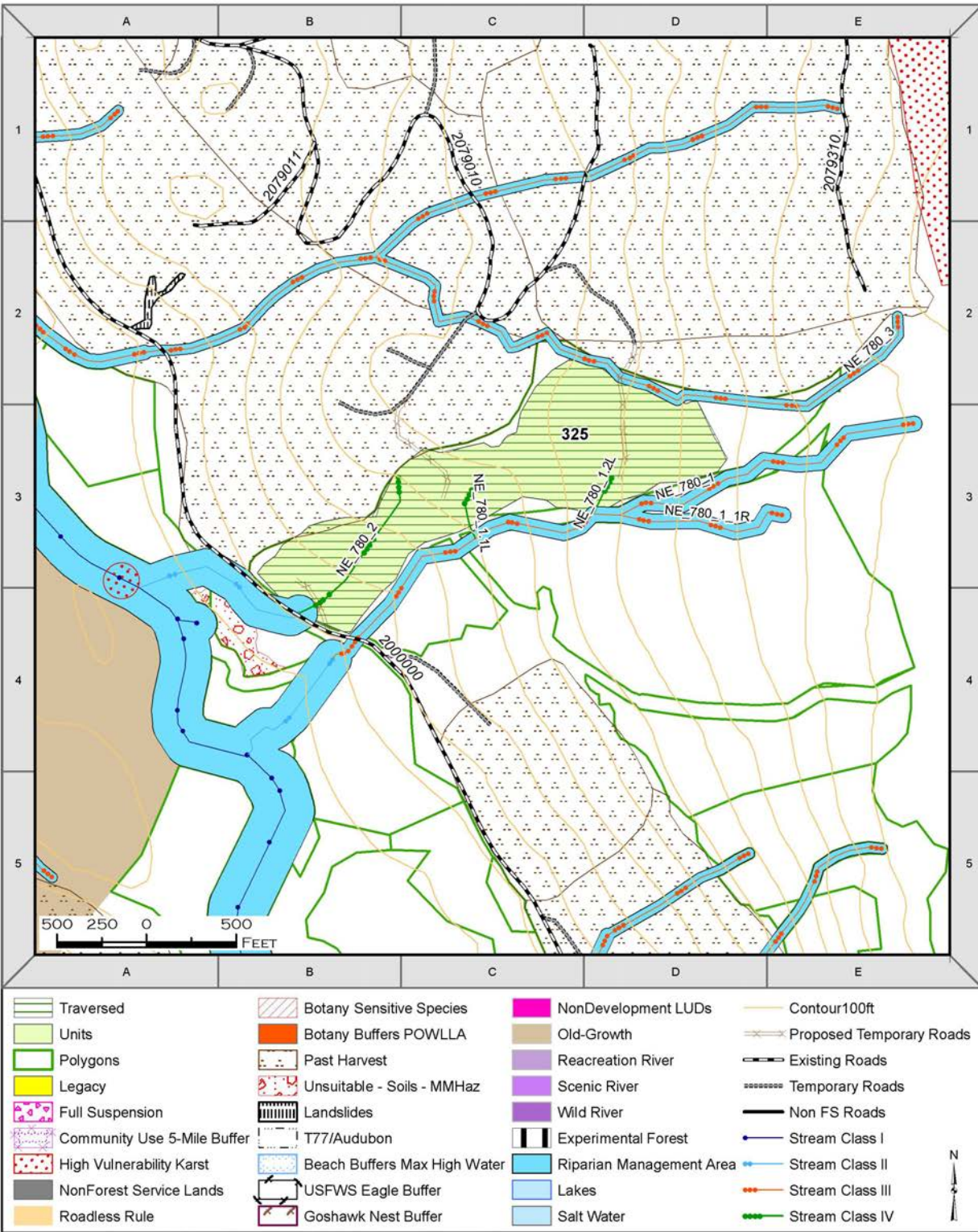
No recreation concerns, as proposed, as of 09 July 2019.

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

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greater than 72% are suitable in the eastern portion of the unit. The remainder of the slopes within the unit boundary are suitable for a minimum of partial suspension cable yarding. Forested wetland is present on the throughout the unit (R10 BMP 12.5 and National Core BMPs AqEco-2 and AqEco-4). The proposed temporary road will be reviewed prior to implementation. Follow R10 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
May/June goshawk surveys have been completed: no detections. July/August goshawk surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 325

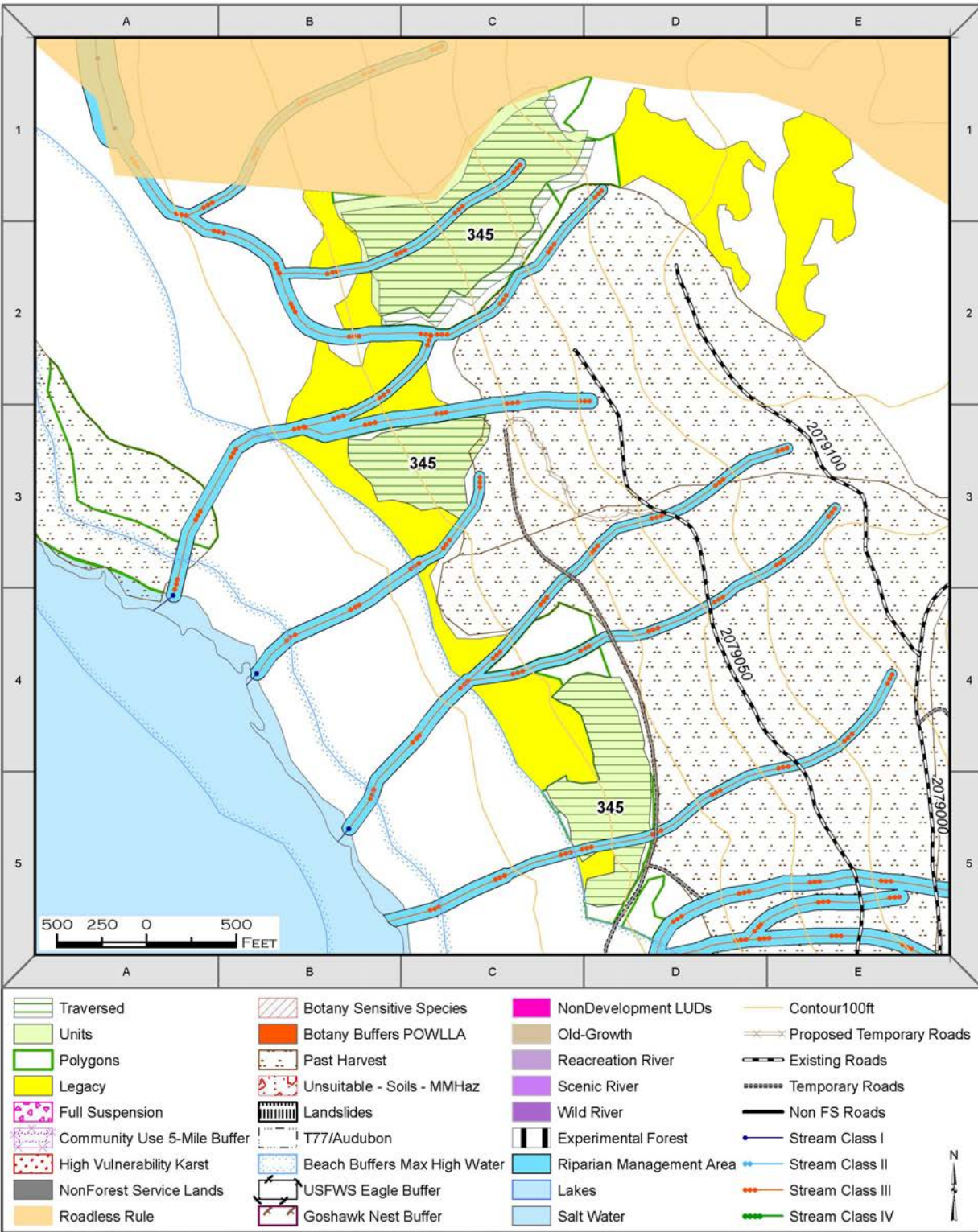


Unit 325							
Unit Number:	325	Total Harvest Unit Acres	31	Prescription:	EA	Harvest System:	Cable
VCU Number:	5330	LUD:	Modified Landscape		Net Harvest Volume (MBF):		706
Summary of Concerns, Responses, BMPs, and Mitigations							
SILVICULTURE							
Old-growth stands of this type are dominated by 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.							
TIMBER/LOGGING							
This unit is planned for a combination of uphill and downhill yarding to landings located along two proposed temporary roads off of NFSR 2079010 and one proposed temporary road located off of NFSR 2000000.							
ENGINEERING/SYSTEM ROADS							
Access via existing NFS roads 2000000 and 2079010 (BMP 14.20, Road-4, Road-6). New temporary road construction, 0.61 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 POWLLA EIS 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:	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.:	780_1.1L						
Stream Class:	IV						
Channel Type:	HCO						
Protection:	Category C						
Flagging:	G/W						
Buffer (RMA):	Class IV for HCO: No buffer						

Unit 325	
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, 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_3.0
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	
Temporary road is planned to cross Class III Stream Num.780_3 and Class IV Stream Num. 780_2. Should additional or alternate 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	

Unit 325
Surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.
RECREATION
No recreation concerns, as proposed, as of 09 July 2019.
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 (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 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
May/June goshawk survey complete-no detection. July/August goshawk surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 345



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Unit 345						
Unit Number:	345	Total Harvest Unit Acres	35.4	Prescription:	EA	Harvest System: Shovel, Cable
VCU Number:	5320	LUD:	Modified Landscape	Net Harvest Volume (MBF):		806
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 mostly lies within a VCU requiring legacy retention for most even-aged management prescriptions. Because the planned harvest unit is greater than 20 acres in size, legacy retention will be implemented to meet this requirement (Forest Plan, page 4-68). A RAW buffer along the Class III stream within the southern portion of this unit has been prescribed.						
TIMBER/LOGGING						
This unit is planned for a combination of shovel and uphill yarding to landings located along two proposed temporary roads off of NFSR 2079050.						
ENGINEERING/SYSTEM ROADS						
Access via existing NFS road 2079050 (BMP 14.20, Road-4, Road-6). New temporary road construction, 0.75 miles (BMPs 14.5, Road-3, Road-5, Road-6).						
BOTANY						
Portions of the unit have been surveyed for this project. No botany concerns were detected during surveys.						
However, some of this unit has not been surveyed due to time constraints. This unit has low probability of having sensitive plants. However, unless surveys are completed to confirm, activities may impact sensitive or rare plant individuals.						
INVASIVE SPECIES						
Weeds are in the area of the unit along NFSR 2079050. 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 POWLLA EIS 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.:	345_4.0					
Stream Class:	I					
Channel Type:	MMS, HCM					
Protection:	Category A					
Flagging:	B/W					
Buffer (RMA):						

Unit 345

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.

Concerns: High blowdown. Additional RAW buffer to be applied from the intersection of Class IV Stream Num. 345_4.1R and the unit boundary to a distance of 200 feet from Stream Num. 345_4 at the upper end of the timber unit.

Stream Num.: 345_4.1R

Stream Class: I, IV

Channel Type: HCO

Protection: Category A, 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: 100 feet or to the top of the side-slope break; whichever is greater.

Concerns: High blowdown

Stream Num.: 345_4.1L

Stream Class: I

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.

Concerns: Moderate blowdown

Stream Num.: 907_5.0

Stream Class: I, II

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.

Class II for HCO: 100 feet or to the top of the side-slope break; whichever is greater.

Concerns: Moderate blowdown

Stream Num.: 907_6.0

Stream Class: II

Channel Type: HCL, HCM

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.

Concerns: Moderate blowdown

Stream Num.: 907_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

Stream Num.: 907_7.1L

Stream Class: IV

Channel Type: HCO

Protection: Category C

Flagging: G/W

Buffer (RMA): Class IV for HCO: No buffer

Concerns: N/A

Unit 345

Stream Num.: 907_8.0
 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.: 907_9.0
 Stream Class: I, II, IV
 Channel Type: HCL, HCO
 Protection: Category A, 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

Stream Num.: 907_9.1R
 Stream Class: I
 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.
 Concerns: N/A

Stream Num.: 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.

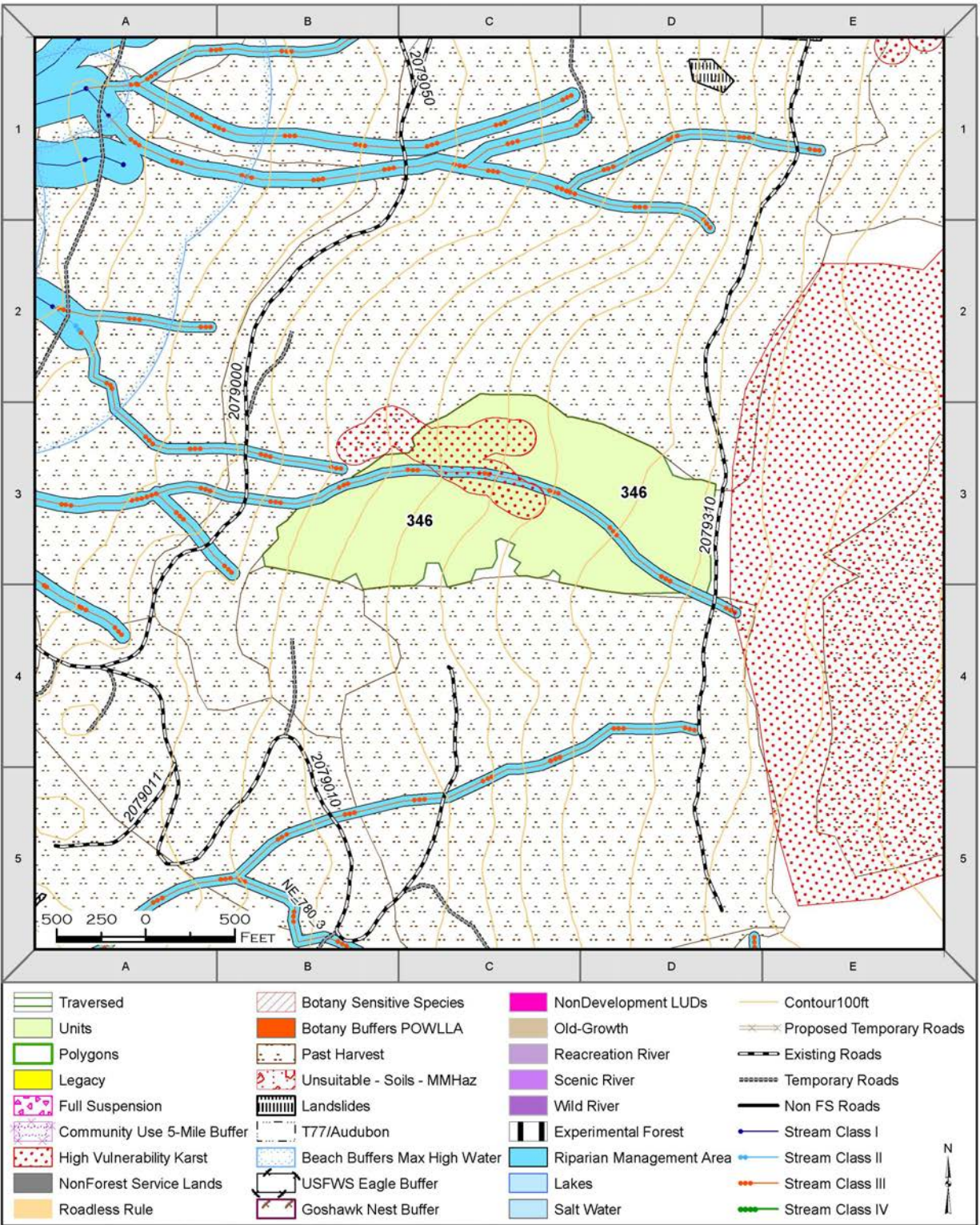
Category C reaches flagged G/W: In so far as practicable, trees will be felled and yarded away from the stream course. Debris that enters the stream channel that may affect water quality or have potential for debris flows will be removed from the stream course.

ROAD/STREAM CROSSING SUMMARY

No temporary road/stream crossings are anticipated. Should temporary road/stream crossings be needed, crossing structures and locations will be approved by USFS, in consultation with fisheries biologist or hydrologist

Unit 345
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
Surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.
RECREATION
No recreation concerns, as proposed, as of 09 July 2019.
SOILS/WETLANDS
Slopes are gentle in the southern and middle polygons. The northern polygon has slopes up to 55%. All slopes within the unit boundaries are suitable for a minimum of partial suspension 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). The proposed road lines will be reviewed prior to implementation. Follow R10 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
May/June goshawk surveys have been completed- no detections. July/August goshawk surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

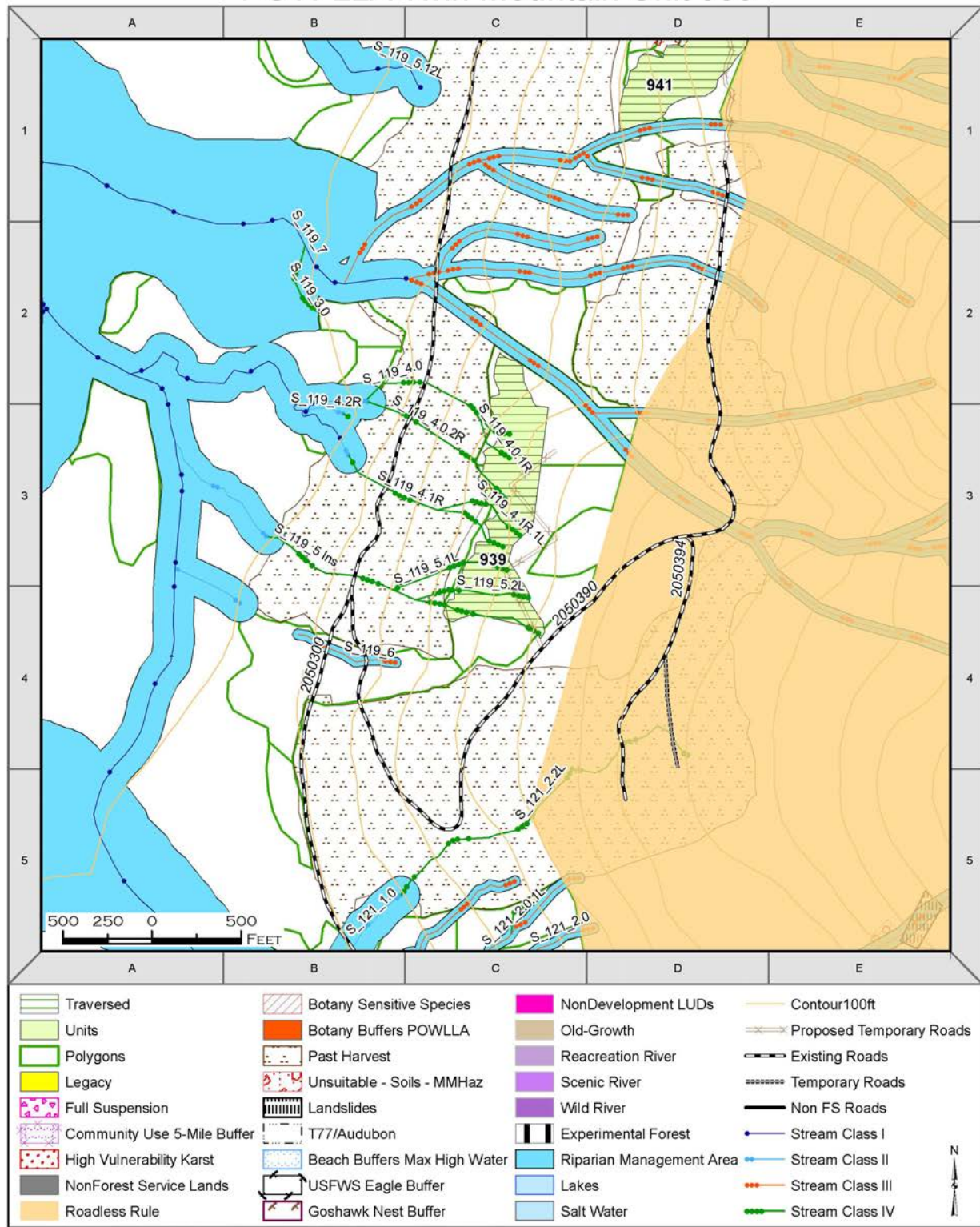
POW LLA Twin Mountain Unit 346



Unit 346						
Unit Number:	346	Total Harvest Unit Acres	39.9	Prescription:	EA	Harvest System: Cable
VCU Number:	5320	LUD:	Modified Landscape		Net Harvest Volume (MBF):	800
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 planned harvest unit is greater than 20 acres in size, legacy retention will be implemented to meet this requirement (Forest Plan, page 4-68).						
TIMBER/LOGGING						
This unit is planned for uphill and downhill yarding to landings located off of NFSR 2079310 and along a proposed temporary road off of 2079010.						
ENGINEERING/SYSTEM ROADS						
Access via existing NFS roads 2079010 and 2079310 (BMP 14.20, Road-4, 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 POWLLA EIS 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 (Map Location C-3)					
Stream Class:	III, IV					
Channel Type:	HCM, HCO					
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.:	909_1.1R (Map Location C-3, not currently mapped)					
Stream Class:	IV					
Channel Type:	HCO					
Protection:	Category C					
Flagging:	G/W					

Unit 346	
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 road/stream crossings are anticipated. 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	
Surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.	
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	
Surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.	
RECREATION	
No recreation concerns, as proposed, as of 09 July 2019.	
SOILS/WETLANDS	
Slopes ranged from nearly level to 80% along the cliff bands. Small cliff bands 50 to 75ft in pitch have slopes greater than 72% and less than 35% between the benches in the middle of the unit. Slopes in the eastern third are gentle to 55%. Slopes in the western third average 35 to 65% with more smooth terrain. All slopes are suitable for harvest with 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).	
WILDLIFE	
May/June goshawk surveys have been completed- no detections. July/August goshawk surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.	

POW LLA Twin Mountain Unit 939



Unit 939						
Unit Number:	939	Total Harvest Unit Acres	9.7	Prescription:	EA	Harvest System: Cable
VCU Number:	5880	LUD:	Timber Production	Net Harvest Volume (MBF):		220
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. However, the planned harvest unit is less than 20 acres in size which eliminates this requirement (Forest Plan, page 4-68).						
TIMBER/LOGGING						
This unit is planned for uphill 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, 0.27 miles (BMPs 14.5, Road-3, Road-5, Road-6, Road-7).						
BOTANY						
Portions of the unit have been surveyed for this project. No botany concerns were detected during surveys.						
However, some of this unit has not been surveyed due to time constraints. This unit has low probability of having sensitive plants. However, unless surveys are completed to confirm, activities may impact sensitive or rare plant individuals.						
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 POWLLA EIS 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					

Unit 939

Stream Num.: 119_4.01R
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_4.0.2R
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_5.0
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA): Class IV for HCO: No Buffer
Concerns: N/A

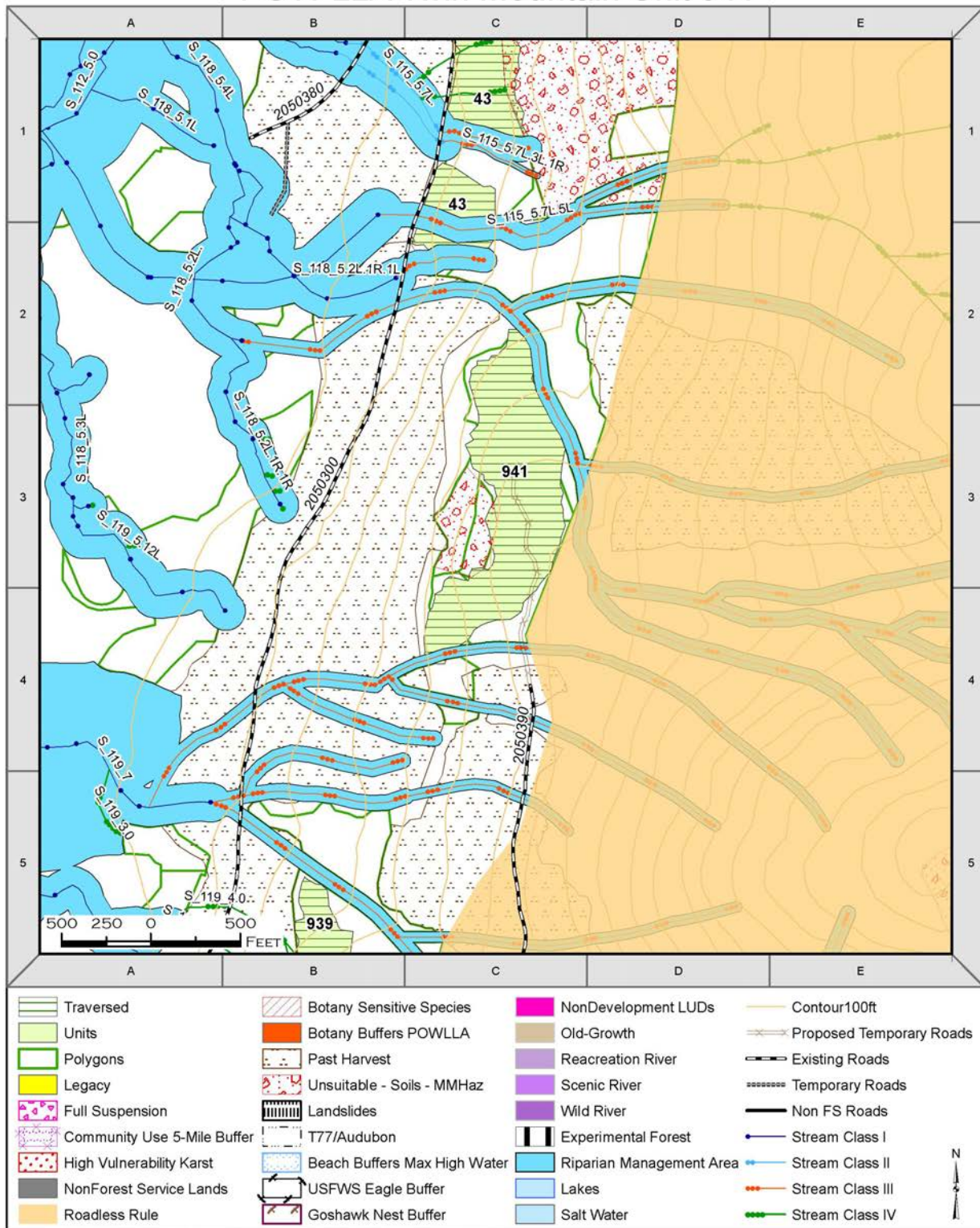
Stream Num.: 119_5.1L
Stream Class: IV
Channel Type: HCO
Protection: Category C
Flagging: G/W
Buffer (RMA): Class IV for HCO: No Buffer
Concerns: N/A

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

Stream Num.: 119_7.0
Stream Class: III
Channel Type: HCM
Protection: Category B
Flagging: O/W

Unit 939	
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	
Temporary road is planned to cross Class IV Stream Nums.: 119_5.1L, 119_5.2L and 119_5.0. Should additional or alternate 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 as proposed as of 7/5/19.	
RECREATION	
No recreation concerns, as proposed, as of 09 July 2019.	
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 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 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.	
WILDLIFE	
May/June goshawk surveys have been completed. July/August goshawk surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.	

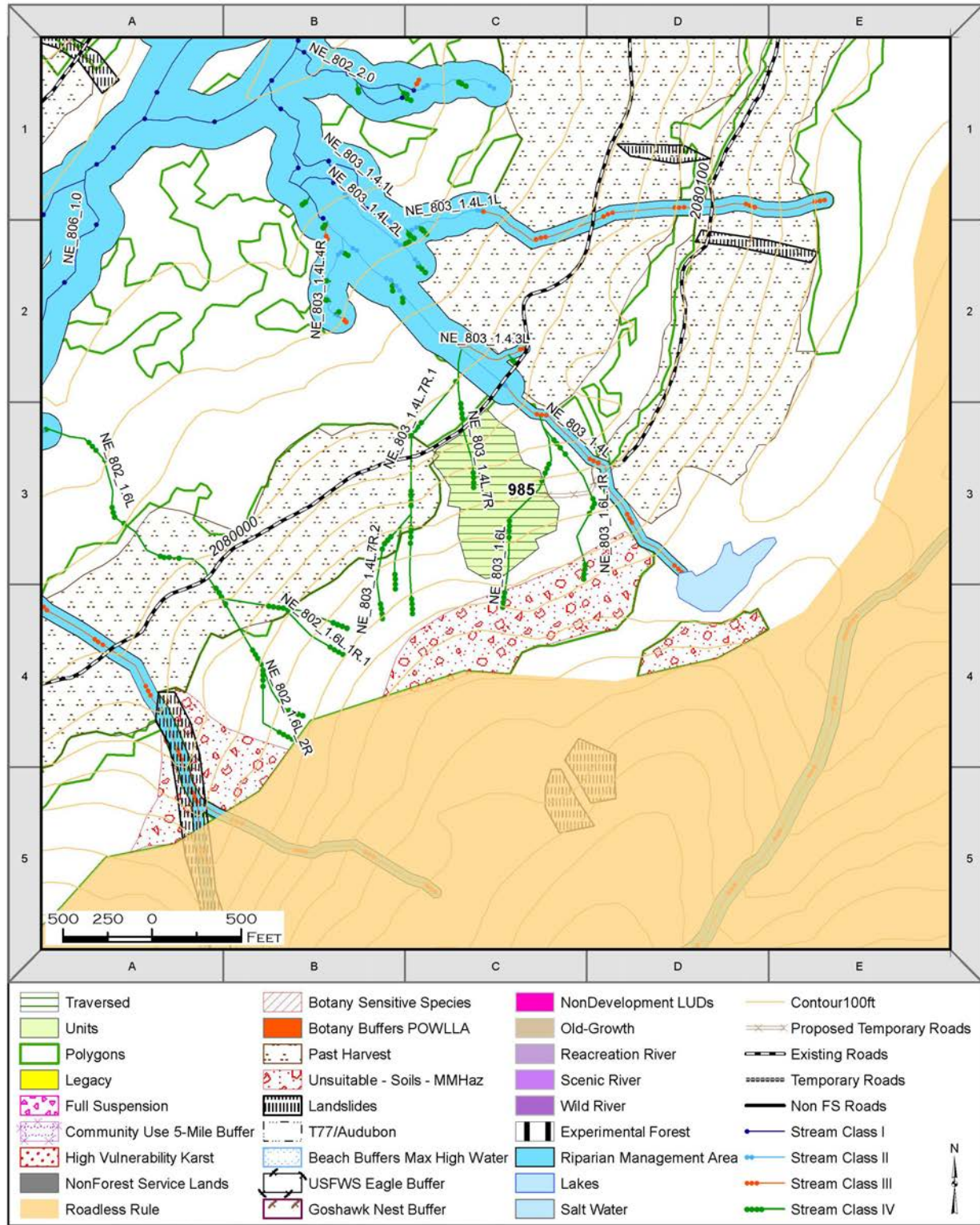
POW LLA Twin Mountain Unit 941



Unit 941							
Unit Number:	941	Total Harvest Unit Acres	16.2	Prescription:	EA	Harvest System:	Shovel, Cable
VCU Number:	5880	LUD:	Timber Production		Net Harvest Volume (MBF):		368
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. Part of this unit lies within a VCU requiring legacy retention for most even-aged management prescriptions. However, this part of the planned harvest unit is less than 20 acres in size which eliminates this requirement (Forest Plan, page 4-68).							
TIMBER/LOGGING							
This unit is planned for a combination of shovel and uphill 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 POWLLA EIS 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							
Surveys are ongoing. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.							
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 941	
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 is expected to cross a Class IV stream. 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 as proposed as of 7/5/19.	
RECREATION	
No recreation concerns, as proposed, as of 09 July 2019.	
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 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 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 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.	
WILDLIFE	
July/August goshawk surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.	

POW LLA Twin Mountain Unit 985

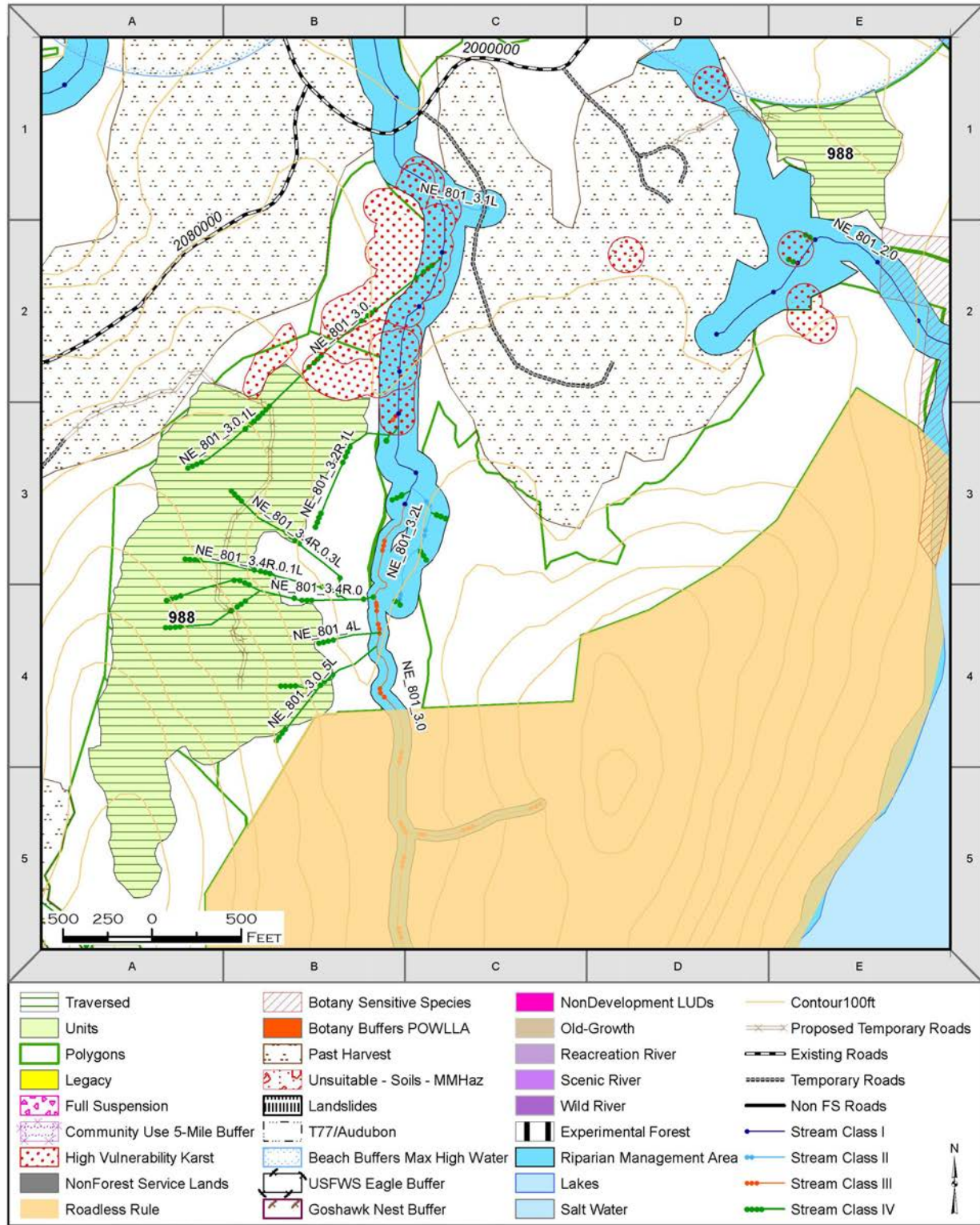


Unit 985						
Unit Number:	985	Total Harvest Unit Acres	9.1	Prescription:	EA	Harvest System: Cable
VCU Number:	5330	LUD:	Timber Production		Net Harvest Volume (MBF):	207
Summary of Concerns, Responses, BMPs, and Mitigations						
SILVICULTURE						
Old-growth stands of this type are dominated by western 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 an alluvial fan in the unit but it was determined to be unnecessary after field review by a team of specialists.						
TIMBER/LOGGING						
This unit is planned for downhill yarding to landings located along NFSR 2080000.						
ENGINEERING/SYSTEM ROADS						
Access via existing NFS road 2080000 (BMP 14.20, Road-4, Road-7).						
BOTANY						
Surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.						
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 Activities 13, 19, 23 and 24 in the POWLLA EIS 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, III					
Channel Type:	HCM, AFH					
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 AFH: 140 feet or within the active portion of the fan, whichever is greater.					
Concerns:	Moderate blowdown in the stream.					
Stream Num.:	NE_803_1.4L.7R					
Stream Class:	IV					
Channel Type:	HCO					
Protection:	Category C					

Unit 985	
Flagging:	G/W
Buffer (RMA)	Class IV for HCO: No Buffer
Concerns:	N/A
Stream Num.:	NE_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.:	NE_803_1.6L
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.:	NE_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
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 is planned to cross Class III Stream Num. 803_1.4L and Class IV Stream Num. 803_1.6L. The Class III portion of Stream Num. 803_1.4L is an alluvial cone, temporary road/stream crossing structures will be removed immediately following operations. 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	

Unit 985
No scenery concerns as proposed as of 7/5/19.
RECREATION
No recreation concerns, as proposed, as of 09 July 2019.
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 (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 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.
WILDLIFE
May/June goshawk surveys have been completed. July/August goshawk surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

POW LLA Twin Mountain Unit 988



Unit 988							
Unit Number:	988	Total Harvest Unit Acres	62.4	Prescription:	EA	Harvest System:	Shovel, Cable
VCU Number:	5330	LUD:	Modified Landscape, Scenic Viewshed		Net Harvest Volume (MBF):		1422
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 a combination of shovel and downhill yarding to landings located along a proposed temporary road off of NFSR 2080100 and a proposed temporary road off of NFSR 2000000.							
ENGINEERING/SYSTEM ROADS							
Access via existing NFS roads 2000000 and 2080100 (BMP 14.20, Road-4, Road-7). New temporary road on existing prism 0.34 miles. (BMPs 14.5, Road-3, Road-6). New temporary road construction, 0.71 miles (BMPs 14.5, Road-3, Road-5, Road-6, Road-7).							
BOTANY							
This unit is adjacent to a population of <i>Physocarpus capitatus</i> (Pacific ninebark), which is an S3 plant and considered rare in the state. However, it is not rare on POW. This plant is also in a riparian buffer outside but near the unit and will not be impacted due to project activities. Additional buffers are not recommended.							
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 POWLLA EIS 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, III						
Channel Type:	HCD, MCS						
Protection:	Category A, C						
Flagging:	B/W, O/W						
Buffer (RMA):	Class I for HCD: 100 feet or to the top of the side-slope break; whichever is greater. Class III for HCD: to the top of the side-slope break. Class III for MCS: to the top of the side-slope break.						
Concerns:	Moderate blowdown.						
Stream Num.:	801_3.0.1L						
Stream Class:	IV						

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

Stream Num.: 801_3.0_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.: 801_3.0_5L.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.: 801_3.1R.0
 Stream Class: III
 Channel Type: HCD
 Protection: Category C
 Flagging: O/W
 Buffer (RMA): Class III for HCD: to the top of the side-slope break.
 Concerns: N/A

Stream Num.: 801_3.2R
 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_3.2R.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.: 801_3.3R
 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.: 801_3.4R.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 988	
Stream Num.:	801_3.4R.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.:	801_3.4R.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.:	801_3.4R.0.3L
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.:	801_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	
Five temporary road/stream crossings for Class IV streams are anticipated 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 of the unit is underlain by karst. The karst is of moderate vulnerability with inclusions of High vulnerability surrounding discrete features. Final unit layout excludes high vulnerability karst resources. A harvest method that obtains partial suspension is required on the moderate vulnerability karst.	
HERITAGE RESOURCES	

Unit 988

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

Surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.

RECREATION

No recreation concerns, as proposed, as of 09 July 2019.

SOILS/WETLANDS

Slopes range from gentle to greater than 72%. About an 8 acres of slopes greater than 72% are only suitable for harvest with full suspension. All slopes in the remainder of the unit are suitable for harvest with partial suspension cable and shovel yarding (R10 BMPs 12.5, 13.2 and 13.9 and National Core BMPs Plan-2, Veg-2, Veg-4, 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 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 BMPs 12.5 and 14.9 and National Core BMPs AqEco-2, AqEco-4, Road-2, and Road-7.

WILDLIFE

May/June goshawk surveys have been completed. July/August goshawk surveys have not been completed. All resource-specific information, protections and mitigations will be determined before harvest activities are implemented.