Registered Professional Forester  
Statement of Work and Request for Proposals  
Liberty Utilities Resilience Corridors Project  
Lake Tahoe Basin Management Unit

Background and Statement of Work: The National Forest Foundation (NFF) and the USDA Forest Service (USFS) are working together to protect and restore the Lake Tahoe Basin Management Unit (LTBMU) through targeted efforts in NFF’s Tahoe Headwaters Treasured Landscapes site. In 2020, the NFF, Liberty Utilities, and the USFS are collaborating on the West Shore Liberty Utilities Resilience Corridors Project. The Liberty Utilities Resilience Corridors Project is designed to create resilient forest conditions along utility corridors to reduce the risk of vegetation from growing into or falling onto power lines, increase the health of the forest growing adjacent to power lines to increase resiliency, and to reduce fuels under and adjacent to power lines to reduce risk of catastrophic wildfire. The NFF is seeking the services of a Registered Professional Forester (RPF). The awarded RPF will, collaboratively with the USFS and Liberty Utilities, prioritize treatment locations, develop implementation plans, and oversee implementation treatments that improve the resiliency of forest growing adjacent to Liberty Utilities infrastructure on 230 acres of the LTBMU National Forest. The RPF qualification is required for this position.

Information Requested
If interested in this project, please provide a bid for the above statement of work by providing approach, work experience, and cost. Please also include your capacity for this project and efficiency in designing, preparing, and overseeing power line corridor fuel reduction projects in the past, if any.

This is a request for proposals only and quotations furnished are not offers. This request does not commit the National Forest Foundation to pay any costs incurred in the preparation of submission of the quotation or to contract for supplies or services.

General Specifications

(a) Description of Work – This Request for Proposals is for services related to project design, layout, preparation, and oversite of implementation. Contractor duties will include, but are not limited to; unit layout, unit boundary designation, area determination, cruise design and plan, timber cruising, designation (timber marking), and abiding by the management requirements supplied by the NFF for each project. Once the RPF has supplied the NFF with the unit layout including logging plan, boundary and timber designation, cruise design and final cruise numbers, they will work with the NFF and the Forest Service to develop a contract and supporting documents to be administered by the RPF with oversight by the Forest Service. Prior to project implementation, the Contractor will determine that all prerequisites to contract work are taken care of, attend pre-operations meeting(s), and identify when the implementation contractor will start operations. Throughout the project, the Contractor will conduct necessary inspections of the implementation contractor’s equipment, ensure the implementation contractor adheres to the requirements in the Liberty Utilities Resilience Corridors Project Appendices, consult regularly with USFS and NFF staff on project progress, and conduct inspections at time of implementation contractor invoice. At formal end of project,
the Contractor will ensure that all contractual obligations are met before making a final inspection in coordination with USFS. The full Scope of Work can be found in APPENDIX 1 – Scope of Work.

The Contractor shall identify which efforts and materials they can supply in terms of materials, labor, equipment, supplies, supervision, quality control, and incidentals required to complete the work described. The Contractor shall perform all work in a safe and conscientious manner.

(b) Project Location- The project is located on the Lake Tahoe Basin Management Unit. The general location of the Liberty Utilities Resilience Corridors Project is between Highway 89 and Highway 267, with treatment units in Placer County. A majority of treatment units are located northwest of the community of Tahoe City and northeast of Kings Beach, CA, near Brockway Summit.

(c) Work Schedule- Sale preparation and layout duties for the Liberty Utilities Resilience Corridors Project may begin as soon as October 23, 2020 with implementation planned to begin in July 2021. Project implementation is scheduled to be completed in October 2024. Sale preparation will require approximately 30 - 40 hours per week and implementation oversite will require approximately 30 hours of oversight per week.

Pricing Schedule
Contactor shall price work according to the schedule below. Prevailing wages will be required per conditions of funding sources.

<table>
<thead>
<tr>
<th>Description</th>
<th>Unit Cost</th>
<th>Quantity</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>RPF for Forestry including unit layout, harvest plan, marking, cruising</td>
<td>Hour</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RPF for Project Implementation Administration</td>
<td>Hour</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Open lines above may be used to account for additional costs expected to complete project.
Other Project Requirements and Specifications

(a) **Utilities** – In many locations there will be limited or no sanitation, water, electrical or housing services available. The Contractor shall make its own arrangements for temporary facilities if needed. The NFF Representative will assist the contractor in identifying a camping area near the project site if spiking is the desired option.

(b) **Contractor Responsibilities**: The Contractor will supply materials, labor, equipment, supplies, supervision, quality control, and incidentals required to complete the work described. The Contractor will perform all work in a safe and conscientious manner. Orientation to the project site to support initiation of the work will be conducted by the NFF Representative, with support from USFS staff.

(c) **Specifications** – Project work shall be accomplished in accordance with the following:

Liberty Utilities Resilience Corridors Project:
- APPENDIX B - Inspection Timeline for Stewardship Agreement
- APPENDIX C - General Project Maps
- APPENDIX E - Schedule of Items and Specifications
- APPENDIX F - Timber Removal Specifications
- APPENDIX G - Guidelines for Operations
- APPENDIX H - Fire Plan

Please note, all appendices will be supplied by the NFF and included prior to project implementation. Not all appendices are included in this request for proposals.

Contractor Qualifications

(a) **References** – Please provide three references.

(b) **Past Experience** – Please provide a brief explanation of previous work experience with land management agencies and power line fuel reduction projects.

Insurance Requirements

Upon selection of the winning bid, chosen contractor will be asked to affirm that it has and shall maintain State minimum workers’ compensation insurance coverage for its employees, if any. The selected contractor shall also maintain broad form general liability, property damage, and automotive liability insurance in the minimum amount of $1,000,000 for bodily injury, death, or damage to property of any person and $2,000,000 for bodily injury, death, or damage to property of more than one person. The Contractor shall name NFF an Additional Named Insured and provide NFF with documentation evidencing such coverages.

Bid Submission

Submit bids to tseck@nationalforests.org by October 16, 2020.

Contractor Selection Process

The NFF will use the Evaluation Factors below to review each submitted bid. Based on the outcomes of that selection process, the NFF will notify successful and unsuccessful bidders by October 23, 2020, and will prepare a separate contract document.
Point of Contact
For questions about the details of producing the bid, please contact:

Trevor Seck
National Forest Foundation, California Program Coordinator – Tahoe Area
530.760.7419
tseck@nationalforests.org

Evaluation Factors and Relative Importance

<table>
<thead>
<tr>
<th>Level 3 Criteria</th>
<th>Level 2 Criteria</th>
<th>Level 1 Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Price / cost</td>
<td>• Technical proposal / proposed approach to project</td>
<td>• Benefits to the local community</td>
</tr>
<tr>
<td>• Equipment and contractor capability</td>
<td>• Overall strategic benefits to meeting NFF goals and grant needs, requirements, and timelines</td>
<td>• Relationship to local community</td>
</tr>
<tr>
<td>• Timing of when contractor can begin and/or finish the project</td>
<td></td>
<td>• Experience working on power line corridor fuel reduction projects</td>
</tr>
<tr>
<td>• Past performance, references, and USFS feedback</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Equal Opportunity Provider
In accordance with Federal law and U.S. Department of Agriculture policy, the National Forest Foundation is prohibited from discriminating on the basis of race, color, national origin, sex, age, religion, political beliefs, or disability.
APPENDIX 1 – Statement of Work

Description of Work:

The Contractor will work collaboratively with the NFF, Liberty Utilities, and the USDA Forest Service (USFS) to prioritize treatment locations, develop implementation plans, and implement treatments that improve the resiliency of forest growing adjacent to Liberty Utilities infrastructure, reduce the risk of wildfire by removing vegetation that could grow into or fall onto utility lines, and reduce risk of catastrophic wildfire by reducing fuels adjacent to utility lines. The Contractor will also function as inspection, quality control, and oversight for the implementation and administration of the Liberty Utilities Resilience Corridors Project on the Lake Tahoe Basin Management Unit during spring, summer, and fall, 2020-2024. Project layout and preparation will require approximately 30-40 hours per week; implementation oversight will require approximately 30 hours of oversight per week.

Project Preparation and Design

Contractor duties will include, but are not limited to; unit layout, unit boundary designation, area determination, cruise design and plan, timber cruising, designation (timber marking), and abiding by the management requirements supplied by the NFF for each project. Once the Contractor has supplied the NFF with the unit layout including logging plan, boundary and timber designation, cruise design and final cruise numbers, the Contractor will work with the NFF and the USFS to develop and administer a contract with oversight by the USFS.

Unit Layout
1. The Contractor will locate and flag cutting units as identified on timber sale area planning maps using aerial photos, topographical maps and GPS.
2. The Contractor will sketch a map of each unit and include existing landings, skid trails, location of streams, stream class, survey monuments, and sensitive areas. Contractor will assess logging feasibility and logging system, including access to units via existing roads, reconstructed roads, and/or new road construction.
3. The Contractor will assess economic viability and feasibility of implementation for each unit. Evaluate pieces per turn, flight distances and volumes per acre. The minimum harvestable volume per acre by logging system will be defined in individual task orders.

Area Determination
1. The Contractor will map every cutting unit boundary with a global positioning system device (GPS). Mapping and acreage determination will meet the direction set forth in FSH 2409.12 Chapter 50. The polygon shapes must represent the unit boundaries on the ground. GPS data will be shared with the NFF and the USFS.

Cruise Design and Plan
1. The Contractor shall be responsible for developing the timber cruise design and plan. The cruise will be designed to achieve a maximum sampling error according to FSH 2409.12 Chapter 40.
2. The Contractor will develop and provide written cruise instructions. These instructions must be approved by USFS staff prior to implementation. The USFS Contracting Officer can provide sample instructions upon request.
Timber Cruising
1. The Contractor will provide the project cruise design and plan. Sampling errors stated in the cruise plan will be met. If these errors are not met and additional samples can be obtained in an unbiased manner, Contractor must supplement the cruise to correct deficiency.
2. The Contractor will ensure each cruiser has written cruise instructions on how plots or measure trees will be identified on the ground, how measure trees will be selected, measurements to be recorded, plot locations, boundary plot directions, and any other information necessary to conduct a proper cruise.
3. Field data recorders with the applicable USFS cruising software must be used during data collection for tree-based cruise methods. Unless otherwise agreed, the Contractor will process and provide cruise data using the most current versions of USFS cruising software. The applicable electronic cruise files (.cruise and .out files) will be provided to the USFS on a weekly or otherwise agreed to basis throughout the cruise implementation.
4. All measurements and defect determinations will be completed in accordance with FSH 2409.12, Chapters 10 and 20. Contractor will document reasons for defect deductions on measure trees.

Cruise Implementation
1. Upon USFS acceptance of the cruise plan and design, the Contractor will conduct the timber cruise following all applicable guidelines. Timber cruise data will be shared with the NFF and the USFS to generate timber appraisals and volume estimates.
2. The Contractor will agree to USFS check-cruises to verify data accuracy and meet standards described in FSH 2409.12. Chapter 60.

Designation (Tree Marking) of Cut or Leave Trees
1. The Contractor will designate mark and leave trees following the NFF provided Silvicultural prescriptions and/or Marking Guidelines. Tracer paint will be supplied by the USFS.
2. All marking will meet the standards and guidelines in the Timber Cruising Handbook WO and R5 Supplements of FSH 2409.12, Chapter 70, and the forest’s Timber Theft Prevention Plan (TTPP).

Implementation Oversite:

Before Project Implementation Start:
1. The Contractor will review with the NFF and the USFS all project information such as the USFS planning decision document and all paperwork necessary for a timber sale. This may include the project appendices, preliminary logging plan, USFS appraisal documents, the road package, harvest cards, route of haul map, etc. The Contractor determines that all prerequisites to contract work are taken care of, such as, but not limited to, environmental protection measures, delegations of authority, operating schedules, road maintenance/erosion control, advance deposits, improvement locations, and logging plan preparations.
2. The Contractor will attend pre-operations meeting(s) and identify when the implementation contractor will start operations. The Contractor will review plans and schedules with implementation contractors to assure common understanding of conditions and responsibilities.

At Project Implementation Start:
1. As necessary, the Contractor will conduct an inspection of the implementation contractor’s equipment to ensure that it is weed-free.
2. The Contractor will conduct a fire inspection of the implementation contractor’s equipment in coordination with the USFS.
3. The Contractor will ensure that they have a regular presence on-site during the first week of operations.
4. The Contractor will inspect falling and skidding at project start to ensure specifications are met.
Throughout Project Implementation:
1. The Contractor will ensure the implementation contractor adheres to the requirements in the Liberty Utilities Resilience Corridors Project (Appendices B - H) and relevant USFS planning decision documents.
2. The Contractor will document all findings for the project record in “Daily Journal” forms to be provided by the NFF. They consult with the USFS and NFF personnel regularly to report progress and any deficiencies. The Contractor will work with the implementation contractor to identify upcoming work that will be occurring over the next five business days. The Contractor will document this upcoming work plan in the “Upcoming Work Schedule” section of the “Daily Journal” form.
3. The Contractor will advise implementation contractor’s field representatives of adequacy or inadequacy of operations and achieve compliance with contract terms, including safety and employment requirements. They take appropriate action to correct deficiencies, and will advise the NFF to implement a “Stop Work Order,” if needed.
4. Contractor duties include but are not limited to administering sale of timber. The Contractor will check loads and ensure that logs are painted/branded, and ensure load tickets are accounted for are properly filled out, punched, and attached.
5. The Contractor is responsible for continuing field inspection and control of contractor’s operations such as service work items, timber falling, skidding and yarding, decking, loading, hauling, and all log accountability requirements. They will determine if utilization, slash disposal, and road maintenance/erosion control are adequate. In coordination with the USFS, the Contractor will identify, inspect, and approve potential landing sites, skid trails, and temporary roads, and mark add volume and hazard trees as necessary.
6. The Contractor is responsible for conducting formal field inspections at time of implementation contractor invoice. The Contractor will ensure that all contractual obligations are met on a per-unit basis in coordination with USFS and the NFF before payment is provided to implementation contractor.

End of Project Implementation:
1. The Contractor will pay special attention to landing clean up and that all roads are left to specification. The Contractor will ensure project winterization procedures have been completed prior to the end of each field season. At formal end of project, the Contractor will ensure that all contractual obligations are met before making a final inspection in coordination with USFS. The Contractor will return any borrowed equipment (paint, flagging, etc.) at the end of each field season and upon project completion.
## Appendix B

### Technical Project Proposal

**Appendix B**

**Inspection Timeline for Stewardship Agreement**

1. Estimated Plan of Operation for Accomplishing this Stewardship Agreement

### Stewardship Work Items

<table>
<thead>
<tr>
<th>Item #</th>
<th>Work Activity Description</th>
<th>Estimated Start Work Date</th>
<th>Estimated Finish Date</th>
<th>Estimated # of Days to Complete</th>
<th>Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Thinning and log forwarding (or skidding) of sawlog and biomass material, log branding, log haul, and borate stump treatment</td>
<td>July 2021</td>
<td>Oct 2023</td>
<td>TBD</td>
<td>Harvesting System (s) TBD</td>
</tr>
<tr>
<td>2</td>
<td>Fuels Treatment-Cutting snags and removal, masticating, chipping, piling, or lopping &amp; scattering of activity and existing slash &amp; biomass</td>
<td>July 2021</td>
<td>Oct 2024</td>
<td>TBD</td>
<td>System/Methods TBD</td>
</tr>
<tr>
<td>3</td>
<td>Removal of Slash at Landings</td>
<td>July 2021</td>
<td>Oct 2024</td>
<td>TBD</td>
<td>Whole tree chipper/grinder</td>
</tr>
</tbody>
</table>
2. Estimated Quality Control Plan for Accomplishing this Stewardship Agreement.

**Partner**

**Stewardship Items**

<table>
<thead>
<tr>
<th>Work Activity</th>
<th>Frequency of Inspection</th>
<th>Inspector</th>
<th>Remedy for Unacceptable Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical Thinning</td>
<td>Daily</td>
<td>NA</td>
<td>Follow Project Rx</td>
</tr>
<tr>
<td>Fuels Treatments</td>
<td>Daily</td>
<td>NA</td>
<td>Follow Project Rx</td>
</tr>
<tr>
<td>Erosion Control</td>
<td>Daily</td>
<td>NA</td>
<td>Follow Project Rx</td>
</tr>
</tbody>
</table>

**Forest Service**

**Timber/Service Items**

<table>
<thead>
<tr>
<th>Work Activity</th>
<th>Frequency of Inspection</th>
<th>Inspector</th>
<th>Remedy for Unacceptable Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical Thinning</td>
<td>Bi-Weekly</td>
<td>NA</td>
<td>Follow Project Rx</td>
</tr>
<tr>
<td>Fuels Treatments</td>
<td>Bi-Weekly</td>
<td>NA</td>
<td>Follow Project Rx</td>
</tr>
<tr>
<td>Erosion Control</td>
<td>Bi-Weekly</td>
<td>NA</td>
<td>Follow Project Rx</td>
</tr>
</tbody>
</table>
1. Project Preparation and Sale Administration for All Treatment Units:
   
a. NFF will complete all aspects of the Project Preparation and Layout, including identification and marking of treatment unit boundaries, area determination, will follow Forest Service silvicultural prescriptions and marking guidelines to develop cruise design, conduct timber cruising, designation (marking and/or by description or prescription), volume determination, appraisal and valuation; designation of resource protection buffers for channels/waterbodies and other protected resources, and development of sale area maps.

b. The Forest Service will development of silvicultural prescriptions and marking guidelines for NFF to utilize during project preparation. The Forest service will determine appraisal and valuation of National Forest timber. The Forest Service will conduct check cruising and other quality control of NFF project preparation work.

c. The Forest Service will conduct Sale and Project Administration duties, including oversite and accountability of timber, biomass and other forest products being removed from National Forest System lands. NFF will have a Registered Professional Forester oversee the day to day operations of Liberties timber contractor to insure compliance of contract specifications and resource protection measures. Sale and project administration will be coordinated through the NFF Sale Administration RPF and Forest Service Sale Administration staff.

4. Refinement and Modification: Once project layout is completed and volume estimates and valuation determinations have been completed, a modification will be made to update this agreement with project specific details.

   a. The stewardship agreement (SA) will be implemented in phases/projects. After sale area preparation work is completed, this SA will be updated to reflect actual treatment unit acres, actual timber volume and value, road and other applicable sections specific to the work identified under each phase/project.

   b. For each phase/project, the SA will be modified and updated to reflect project specific details. The following sections may require updating:
      • Appendix C: Maps
      • Appendix D: Financial Plan
      • Appendix E: Schedule of Items and Specs
      • Appendix F: Timber Removal Specs
      • Appendix G: Guidelines for Operations
      • Appendix H: Fire Plan

5. NFF will award the Request For Proposal (RFP) for treatment implementation. NFF will work with the contractor to provide a Technical Proposal which will be reviewed and approved by the Forest Service and incorporated into the SPA under Section B – Technical Proposal for each treatment unit/project.
## Schedule of Items

*Complete table to include the project items.*

### SCHEDULE OF ITEMS – FY20:

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Description</th>
<th>Unit of Measure</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Zone 1 Treatments Units TBD – Fuels reduction, vegetation clearance and tree removal</td>
<td>Acre</td>
<td>23</td>
</tr>
<tr>
<td>2</td>
<td>Zone 2 Treatments TBD - Thinning and log forwarding (or skidding) of sawlog and biomass material, log branding, log haul, and borate stump treatment</td>
<td>Acre</td>
<td>230</td>
</tr>
<tr>
<td>3</td>
<td>Zone 2 Treatments TBD - Fuels Treatment-Cutting snags and removal, masticating, chipping, piling, or lopping &amp; scattering of activity and existing slash &amp; biomass</td>
<td>Acre</td>
<td>230</td>
</tr>
<tr>
<td>4</td>
<td>Removal of Slash at Landings</td>
<td>Tons</td>
<td>5750</td>
</tr>
<tr>
<td>5</td>
<td>Road Maintenance and Erosion Control</td>
<td>Project</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>RPF Services – Project Preparation</td>
<td>Project</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>RPF Services – Quality Control/Administration</td>
<td>Project</td>
<td>1</td>
</tr>
</tbody>
</table>
SPECIFICATIONS. [By item number, describe the type of work, i.e., slash treatment, weed treatments, etc. and the corresponding specifications.]:

**Item 1: Zone 1 Treatments – Fuels reduction, vegetation clearance and tree removal**

Within the Liberty Resilience Corridors Project, there are 18 Zone 1 stands totaling approximately 172 acres. Zone 1 is an area that is 30’ wide (15’ on either side of existing utility infrastructure). Within this zone, the responsibility for funding vegetation management and fuels reduction belongs to Liberty Utilities. Within Zone 1, vegetation that poses a risk to grow into, contact or fall into utility infrastructure will be removed. Guidelines to determine minimum clearance requirements for utility are guided by state law and Liberty Utilities Wildfire Mitigation Plan. In addition fuels accumulation and vegetation growing within Zone 1 will be reduced to meet fire behavior modification goals. Fuels and vegetation management within the Zone 1 are also guided by Liberty Utilities Wildfire Mitigation Plan.

NFF will coordinate with Liberty Utilities to ensure this work is completed prior to or during implementation of Resilience Corridor treatments.

**Item 2: Zone 2 Treatments - Thinning and log forwarding (or skidding) of sawlog and biomass material, log branding, log haul, and borate stump treatment**

Within the Liberty Resilience Corridors Project, there are 18 Zone 2 stands totaling approximately 1,663 acres. Zone 2 is an area that is up to an additional 160’ beyond Zone 1 either side of the utility infrastructure (approximately 175’ distance from utility lines). The actual distance for Zone 2 is based upon the height of the trees growing adjacent to utility infrastructure. Some areas may be narrower in width than others. Within Zone 2, trees will be thinned to improve forest health and reduce fuels. Thinned trees will be processed and forwarded or whole tree skidded to established landings for processing and sorting. Harvesting methods will be determined on a unit by unit bases, depending on resource sensitivity. Logs will be hauled off site and cut stumps will be treated with borate.

**Whole Tree Specifications:** Work activities shall be accomplished utilizing hand falling marked trees or mechanical harvesting and whole tree removal, operating over dry ground or over-the-snow. Trees shall be skidded/yarded to agreed landing locations prior to limbing, bucking, and lopping. Trees larger than or equal to 20 inches DBH shall be bucked into two or more pieces with the butt portion being no longer than 41 feet prior to skidding/yarding. The butt log shall be limbed prior to skidding/yarding. Skid road pattern shall be agreed in advance of felling and main skid roads shall be flagged on the ground in advance of felling. Products shall be skidded with leading end clear of ground. Products shall be end-lined as needed to protect resources or residual timber from unnecessary damage. In Whole Tree stands, whole tree removal of sawlog and small trees to the landing will be required, with some lopping and scattering or piling of slash allowed.

**Cut-to-Length Specifications:** Work activities shall be accomplished utilizing a cut-to-length harvester and a log forwarder operating over dry ground or over-the-snow. The NFF Contractor shall have at least one rubber-tire harvester and one rubber-tire log forwarder for operating within stream environment zones where no tracked equipment shall be allowed. Tracked equipment shall be allowed for treatment areas outside of stream environment zones. In Cut-to-Length stands masticating, chipping or lopping and scattering of slash and other biomass and whole tree removal of small trees and top portions and limbs of larger trees may be required. Operations on slash mat in SEZ is required, operation on slash
mat in upland is preferred to reduce impacts to soils. This item include thinning of commercial and pre-commercial (small tree) service work.

**Hand Thinning:** In areas where equipment is restricted, hand felling of designated trees will be utilized. Stumps from felled trees will be cut as low as safely possible to the ground, with a target of 6” or less on the high side of the ground. Treatment prescriptions may need to be modified where yarding and removal of cut trees is not feasible.

NFF will determine, using guidance from the Forest Service Liberty Utilities Resilience Corridors Decision Memo and associated resource protection measure on areas requiring hand felling during project unit layout.

**Item 3: Zone 2 Treatments - Fuels Treatment-Cutting snags and removal, masticating, chipping, piling, or lopping & scattering of activity and existing slash & biomass**

Within Zone 2, fuels treatments will be completed as follows:

**Fuels Treatments in units where Whole Tree Harvesting is conducted**

Fuels treatment includes the treatment of existing and contractor generated slash and biomass material. This includes the cutting of snags and treatment of concentrations of down fuels and other contractor generated slash. Slash and biomass will be removed to landings or treated according to the specifications. Individual unit fuels treatment specifications will be updated by the Forest Service after unit preparation and layout work is completed.

<table>
<thead>
<tr>
<th>Slash type</th>
<th>Remove/Lop &amp; Scatter/Pile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biomass: Green trees 2.0-3.9” DBH</td>
<td>Lop &amp; Scatter to less than 18 inches or pile on contract administrator approval.</td>
</tr>
<tr>
<td>Biomass: Green Trees 4.0-9.9” DBH</td>
<td>Whole tree removal to landing required. Remove any piece 4.0” diameter and 10’ long. Remaining will be lopped and scattered to less than 18 inches. Piles permitted on contract administrator approval.</td>
</tr>
</tbody>
</table>

**Fuels Treatments in units where Cut-To-Length Harvesting is conducted:**

Fuels treatment includes the treatment of existing and contractor generated slash and biomass material. This includes the cutting of snags and treatment of concentrations of down fuels and other contractor generated slash. Slash and biomass will be removed to landings or treated according to the specifications. Individual treatment unit fuels treatment specifications will be updated by the Forest Service after unit preparation and layout work is completed.
<table>
<thead>
<tr>
<th>Slash type</th>
<th>Upland Areas</th>
<th>Stream Environment Zones (SEZ) &amp; Riparian Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biomass: Green biomass 24” tall – 2.9” DBH</td>
<td>Masticate/chip. If masticated/chip depths exceed 4.0” or mastication is not feasible, pile or lop &amp; scatter on approval.</td>
<td>Lop and scatter. If lop and scatter depths exceed 18.0” remove to upland areas and treat according to upland area specifications.</td>
</tr>
<tr>
<td>Activity slash: Tops and limbs</td>
<td>Remove material at least 3.0” dia., 6’ long. Remaining can be masticated/chipped. If masticated/chip depths will exceed 4.0” or mastication is not feasible, pile or lop &amp; scatter on approval.</td>
<td>Remove material at least 3.0” dia., 6’ long. Remaining can be lopped and scattered. If lop and scatter depths exceed 18.0” remove to upland areas and treat according to upland area specifications.</td>
</tr>
<tr>
<td>Existing slash: Snags</td>
<td>Cut all snags 2.0-9.9” dbh and all blue marked snags. Remove sound material 3.0-29.9” diameter and 6’ long if not needed for down log requirement. Material not removed will be masticated, chipped or piled on approval where concentrations of fuels exist.</td>
<td>Cut all snags 2.0-9.9” dbh and all blue marked snags. Remove sound material 3.0-29.9” diameter and 6’ long if not needed for down log requirement. Remaining can be lopped and scattered. If lop and scatter depths exceed 18.0” remove to upland areas and treat according to upland area specifications.</td>
</tr>
<tr>
<td>Existing slash: Down Logs</td>
<td>Retain or redistribute throughout stand to meet down log requirement. Remove sound material 3.0-29.9” diameter and 6’ long in excess of down log requirement. Material not removed will be masticated, chipped or piled on approval where concentrations of fuels exist.</td>
<td>Retain or redistribute throughout stand to meet down log requirement. Remove sound material 3.0-29.9” diameter and 6’ long in excess of down log requirement. Material not removed will be moved to upland areas and treated according to upland area specifications.</td>
</tr>
</tbody>
</table>

**Fuels Treatments in Hand thinned areas:** Whenever feasible, cut trees should be whole tree aerially removed using partial or full suspension of trees. Removed trees will be yarded to landings or to areas where ground based equipment can skid or forward them to landings. Where removal of cut trees is not possible, cut trees will be piled for burning up to 14” in diameter. Portions of cut trees larger than 14” will be left in log form on the forest floor. Slash piles should be constructed at least one and one-half (1.5x) the diameter of the pile from residual trees, or as agreed to by the Forest Service; for example, a 10-foot diameter pile shall be 15-feet away from residual trees. Pile height and width should be proportionate; for example a 4-foot high pile should be 4-feet wide. Minimum pile size shall be 4 feet in diameter.

**Item 4: Removal of Slash at Landings**

It is the intent of this project to either remove or dispose of as much slash generated from operations as possible so as to limit the amount of post contract government slash and/or pile burning. Slash that is yarded to landings (small trees, limbs, tops, dead and down) shall be removed or chipped by the NFF Contractor when biomass markets are available. Landing slash disposal will be the responsibility of the NFF contractor and is a separate bid item. This should be an optional item for timber harvest contract and can be contracted separately from timber removal.
**Item 5: Road Maintenance and Erosion Control**

The following is intended as a set of operating conditions and erosion control needs for the use of roads, landings, and forwarding trails within summer or winter operating seasons. Included in this Item is equipment mobilization, and the costs associated with seasonal move-in and move-out requirements. Ground disturbing work cannot begin in any unit until FS personnel have determined operable soil conditions exist. Work must be in compliance with all applicable Best Management Practices (BMPs) applicable water quality Resource Protection Measures from the Timber Waiver Permit, and the LTMBU Agreement for Wet Weather Operations and Operations Outside Normal Operating Season.

NFF’s contractor shall perform specified road maintenance and erosion control activities, which includes but is not limited to road blading, drainage maintenance, preventative maintenance, and dust abatement on designated Forest Roads, and any unnumbered newly constructed roads, channel crossings, landings, forwarder trails, existing non-system roads and existing and new temporary roads.

Water for performing road maintenance may be obtained from hydrants in the project vicinity. The contractor is responsible for obtaining a water use permit and encroachment permit for use of county/city/state roads. Specific road maintenance and erosion control requirements for temp roads/landings are listed below. Ripping of landings and temporary roads is not permitted in known noxious weed sites and in rocky soils. A slash mat or construction of temporary crossings will be required when crossing areas of wet soils or stream courses in Stream Environment Zones. Equipment will not be required to operate over a slash mat outside of wet Stream Environment Zones. Where a slash mat is not present on equipment trails, water bars shall be installed upon completion of use of each equipment trail.

Applicable BMP’s and Specific road details, Road Maintenance T-Specs and requirements are to be determined during after project layout work is completed by the Forest Service.

**Item 6 and 7: RPF - Provide Registered Professional Forester for Project Implementation and Quality Control/Administration**

NFF will supply a Registered Professional Forester (RPF) by the State of California to supply the quality control for the implementation and administration of the project. The RPF duties will include, but are not limited to; unit layout, unit boundary designation, area determination, cruise design and plan, timber cruising, designation (timber marking), and abiding by the management requirements supplied by the Forest Service for each project. Once the RPF has supplied the Forest Service with the unit layout including logging plan, boundary and timber designation, cruise design and final cruise numbers, they will work with the Forest Service to develop a contract to be administered by the RPF with oversight by the Forest Service.

Specific duties of the RPF include:

**LAYOUT, MARKING AND CRUISING**

**Unit Layout**

Locate and flag cutting units as identified on timber sale area planning maps using aerial photos, topographical maps and GPS.
Sketch a map of each unit and include existing landings and skid trails. Include logging feasibility and logging system. Include access to units via existing roads, reconstructed roads or new road construction. Show location of streams, stream class, survey monuments and sensitive areas such as landslides or other areas of resource concerns.

Consider economic viability for each unit. Evaluate pieces per turn, flight distances and volumes per acre. The minimum harvestable volume per acre by logging system will be defined in individual task orders.

RPF is advised to do a preliminary survey of each unit prior to installing boundaries and notify Forest Service contact if notable differences exist in the logical unit placement when compared to mapped locations on timber sale area planning map. Changes in boundary locations will be made if necessary for logistics, feasibility of logging system, resource protection, or substantial mortality. Significant changes must be approved by Forest Service. Proposed changes that would include areas outside of mapped boundaries may not be possible due to lack of existing NEPA coverage.

Boundaries of all cutting units will be designated with inter-visible flagging described in specific project task orders. All contract unit boundaries will be clearly located on the ground.

The cutting unit corners and boundary intersections with roads will be identified as follows: Write sale name, unit number, and location of corner (for example Smoky TS, Unit # 100, SW Corner) with permanent marker on flagging and plastic signs provided by the government.

**Unit Boundary Designation**

All contract unit boundaries will be clearly located on the ground. Painted boundary trees will be inter-visible, will not be designated for harvest, and be of a size that will remain standing after logging. The paint application should provide for clear and unquestionable placement of the unit boundaries. Boundaries along permanent roads can be left unmarked where the features are so conspicuous that they can be identified from the sale area map alone.

Cutting unit boundaries will be designated with the color of paint described in specific project task orders. Tree marking paint must contain the registered tracer element, which will be provided by the government. Painted boundaries will follow the flagged lines. All painted boundary trees will have attention marks applied at or above eye level and two stump marks below stump height. The line of sight between painted boundary trees is considered the official boundary.

The cutting unit corners and boundary intersections with roads will be identified as follows: Write sale name, unit number, and location of corner (for example Smoky TS, Unit # 100, SW Corner) with permanent marker on flagging and plastic signs provided by the government.

In addition to unit corners, painted boundaries will be identified with plastic signs every 200 feet on leave trees along boundaries. Plastic signs will contain the sale name and unit number.

**Area Determination**

Every cutting unit boundary will be mapped with a global positioning system device (GPS). Mapping and acreage determination will meet the direction set forth in FSH 2409.12 Chapter 50. The polygon shapes
must represent the unit boundaries on the ground. Shapefiles will be projected in Datum NAD83 Zone (10 or appropriate Zone for the geographic location).

The GPS data will be in a format compatible with ArcMap version 10.3 or with the version the forest is currently using. Final GPS data will be exported by the RPF as shapefiles (.shp). RPF will maintain a secure backup of GPS data for 60 days following transfer to the Forest Service to allow for verification of data.

If conditions on specific units make it impractical or impossible to receive sufficient satellite signals, traditional survey techniques (distance and bearing), or a combination of GPS and traditional survey techniques may be used. Recollect data if the established standards are not met.

Cutting units will have a GPS area error of less than 10 percent of the area measured. If a traditional distance and direction survey is implemented, the error of closure must be better than 1:50 on units less than 20 acres and better than 1:100 on units greater than 20 acres. Depending on device and GPS processing software used, the use of the Forest Service software Two Trails may be required. Distance and direction surveys not meeting the above requirements will have a verification traverse. A different crew must run the verification traverse than performed the original survey. A distance-direction survey that does not meet the error standards above can only be accepted if the difference in acreage between the original survey and the verification survey is less than 10 percent.

RPF will provide documentation with the applicable survey method, equipment used to traverse units, canopy coverage estimates, accuracy based on receiver and conditions from the Missoula Technology and Development Center (MTDC) matrix, projection, coordinate system, and datum. Include names of personnel responsible for data collection, list the programs used to process the data, and note any changes or corrections. If a verification traverse was done include both original and verification traverses.

The MTDC matrix can be found at:

https://www.fs.fed.us/fmsc/measure/geospatial/index.shtml

Cruise Design and Plan

The cruise will be designed to achieve a maximum sampling error according to FSH 2409.12 Chapter 40. The maximum sampling error for any one stratum is 30% for tree measurement sales and 40% for scaled sales.

Document the estimated volume by stratum, coefficient of variation, and the method used to determine these values (Pre-cruise, stand exam, or similar sale). Determine which sampling method will be the most efficient and economical from the list below. Major species groups within each stratum, which are those that comprise 10% or more of the estimated sale value, must be in separate sample groups. The cruise must be designed for a minimum of 20 measure trees per sample group per stratum. Species with the same appraised value including WF and RF, PP and JP, and SP and WWP should be in the same sample group.

At a minimum, the sale should be stratified by the planned logging system, marking/designation method, and product.
The cruise plan should contain a brief description of the management objectives and the legal description of the project area. Include all calculations made to allocate the sampling error, the number of samples needed by strata and sub-population, plot size or BAF if applicable, population distribution by strata and sample group, and selection frequency by sample group.

Provide written cruise instructions on how plots or measure trees will be identified on the ground. Include instruction on how to measure plots that fall near the unit boundary. These instructions must be approved prior to implementation. The CO can provide sample instructions upon request. Ensure a consistent method of measuring boundary plots is described in the cruise instructions. Acceptable methods include mirage, walk-through, and half plots. Plots falling outside of treatment area boundaries will not be measured.

**Acceptable Cruise Methods**

The RPF will choose the appropriate cruise system(s) from the following methods, which are described in FSH 2409.12, chapter 30. Unless otherwise agreed, use area-based cruise methods for strata with significant amounts of either leave tree marking or designations that do not include paint, such as by designation by spacing or prescription. Use tree-based cruise methods for stratum with significant amounts of individually marked cut trees.

- **a. 100 Percent Cruise (100)**
- **b. Sample Tree (STR)**
- **c. Fixed Plots (FIX)**
- **d. Point Sampling (Variable Plot) (PNT)**
- **e. 3P Sampling (3P)**
- **f. Point Count Measure (PCM)**
- **g. Fixed Count Measure Tree (FCM)**

Cruise instructions must include a list of product minimum specifications and included species. Product specifications include the associated contract minimum and maximum DBH, piece length, and top DIB.

Provide a list of cruisers and their unique stump marks.

If it becomes necessary to modify the cruise plan after implementation has begun, the RPF will notify the Forest Service and prepare an addendum to the plan. Add the date of the addendum to the cover page of the plan. Follow the standards and guidelines in FSH 2409.12 chapter 40.

**Timber Cruising**

The intent of the timber cruise is to provide the Forest Service with a cruise report and file to facilitate the timber appraisal process. If the cruise design and plan was prepared by the RPF, all cruising performed under this contract will meet the sampling error requirements set forth in FSH 2409.12, chapter 40. All data collected will meet the accuracy requirements in FSH 2409.12, chapter 60.

1) If the RPF provides the project cruise design and plan, the actual cruise must reach target sampling errors stated in the cruise plan. If these errors are not met and additional samples can be obtained in an unbiased manner, RPF must supplement the cruise to correct deficiency. Additional samples cannot be added to tree-based cruise methods, particularly 3P, unless insurance trees have been previously identified. A complete re-cruise may be necessary for
strata with tree-based cruise methods that do not meet the specified error standards. A reasonable number of measurements per sample group must be taken.

2) The RPF will ensure each cruiser has written cruise instructions on how plots or measure trees will be identified on the ground, how measure trees will be selected, measurements to be recorded, plot locations, boundary plot directions, and any other information necessary to conduct a proper cruise.

3) Field data recorders with the applicable Forest Service cruising software must be used during data collection for tree-based cruise methods. Unless otherwise agreed, the RPF will provide and process cruise data using the most current versions of Forest Service cruising software. The applicable electronic cruise files (.cruise and .out files) will be provided to the Forest Service on a weekly or otherwise agreed to basis throughout the cruise implementation.

4) All measurements and defect determinations will be completed in accordance with FSH 2409.12, Chapters 10 and 20. Document reasons for defect deductions on measure trees. Record all unusual features at plot locations which may influence cruise procedures, hence accuracy (excessive slope, blowdown patch, hazardous conditions, etc.).

5) The names of cruisers must be documented for each unit. Unless otherwise agreed, cruisers will manually record cruise tree information and notes on a Timber Cruise Data Sheet that is available in the back of the Timber Cruise Reference Guide. It is recommended that RPF periodically record tallies and/or sum of KPI by sample group to ensure timber cruise data can be re-entered into a field data recorder if the file becomes damaged.

A. Cruise Implementation:

Cruise the tree that is randomly or systematically selected as a measure tree.

1) Do not manipulate cruise tree selection (add or delete measure trees outside of the planned frequency) if the actual selection of measure trees appears higher or lower than planned. Notify the Forest Service if the design frequencies appear to be falling short of meeting the target errors or number of measure trees. Any frequency adjustments require a new stratum. All strata must meet the applicable error limits.

2) If a species is discovered that is not in the cruise file, add it into the applicable sample group for minor species in the cruise file(s) and notify the Forest Service.

3) Faulty equipment that is out of adjustment and not reading measurements correctly will be replaced and measurements taken with this equipment will be re-measured.

4) Plots must be located on a systematic grid. Do not drop or move a boundary plot if the center falls inside the harvest unit.

B. Plot And Measure Tree Locations:

The RPF will supply cruise maps for each unit with the actual location of plot centers, cruise trees, and insurance trees. If cruise trees and/or plots were located with GPS, provide the shapefiles to the Forest Service. If plots are not located using GPS coordinates, RPF will hang flagging with distance and direction to nearest plot on adjacent roads. RPF is encouraged to use unique plot and tree numbers for all samples.
C. Cruise Evaluation:

The cruise must be evaluated by a Forest Service check cruiser and meet standards described in FSH 2409.12. Chapter 60. The evaluation includes office data audits and field measurement comparisons. The number of samples checked during a field review depends on the cruise methods used but a minimum of 35 trees on a sale must be re-measured. If the results are unsatisfactory with the specified number checked, 10 additional trees per major species will be checked. If the results are still unsatisfactory, a complete or partial re-cruise may be required, depending on the issue(s) identified. A description of elements checked and associated tolerances can be found in Chapter 60, Section II.5.

Designation (Tree Marking) of Cut or Leave Trees

All marking will meet the standards and guidelines in the Timber Cruising Handbook WO and RS Supplements of FSH 2409.12, Chapter 70, and the forest’s Timber Theft Prevention Plan (TTPP).

List all included units, the min and max DBH (if unit specific) for all products and applicable designation (Leave Tree Mark, Individual (cut) Tree Mark, or other):

When selecting cut or leave trees, the RPF will follow the provided Silvicultural prescriptions and/or Marking Guidelines. In addition to the following:

a. The RPF will designate trees that meet the marking guidelines as cut trees in ITM units and leave trees in LTM units.
b. Cut trees in ITM units will be marked with tracer paint and leave trees in LTM units will be marked with tracer paint. Paint a highly visible attention band 2” wide at eye level. The attention mark will be visible from 360 degrees and from at least 50 feet, unless stated otherwise in specific project task orders. The RPF will paint two personalized stump marks on all marked trees. The stump marks will be placed in the furrows of the bark at ground level on the downhill and uphill sides of the trees. Stump marks should touch the ground and be at least 2” wide.
c. Measure tree designations for trees not in plots will include a painted band approximately 1 foot above the original mark and painted cruise tree numbers at eye level and on opposite sides of the tree. If insurance trees are part of this project, paint the same as a cruise tree but add an (I) in front of the cruise tree number. Hang several flags around the cruise tree. Write the cruise tree number, unit number and cruiser’s initials in permanent ink on one of the attention flags. GPS or mark on a map the location of the cruise tree.
d. Use BLACK tracer paint to cancel a mark on a tree. Apply black marks as described in individual task orders. The original marking will be only partially obscured so it will be obvious that this tree was deleted from the timber sale. The black paint must be visible from all directions. Note areas with extensive deleted trees on a map.

Record the amount of marking paint used by color and batch number for each unit.

Quality Control of projects

RPF functions as inspection and quality control on a daily basis for all service items and product removal items within the agreement.

RPF will review the contract and related pre-sale data such as preliminary logging plan,
environment assessment, appraisal, etc. Determines that all prerequisites to contract work are taken care of such as, but not limited to, advance deposits, delegations of authority, road construction and timber cutting coordination, improvement locations, operating schedules, logging plan preparations, scaling arrangements, and environmental protection measures. Reviews plans and schedules with Partners to assure common understanding of conditions and responsibilities.

Throughout the life of the project, the RPF is responsible for continuing field inspection and control of Partner’s operations such as falling, skidding and yarding, loading, hauling, and all log accountability requirements. Determines whether utilization, slash disposal, and erosion control are adequate. Documents all findings for the project record. Takes appropriate action to correct deficiencies, and assesses penalties when needed. Ensures that stream courses and other land features are protected.

Advises Partner’s field representative of adequacy or inadequacy of operations and achieves compliance with contract terms, including safety and employment requirements.

Determines when log hauling may be allowed on system roads under construction, makes agreements, and weekly reports of progress with Forest Service.

Ensures that all contractual obligations are met before making final inspection in coordination with Forest Service.

<table>
<thead>
<tr>
<th>Project</th>
<th>Unit Layout</th>
<th>Cruise/Cruise Design</th>
<th>Paint Boundaries</th>
<th>Mark Unit</th>
<th>G.P.S Boundaries</th>
<th>Q.C of Hand Crew</th>
<th>Q.C of Mechanical Work</th>
</tr>
</thead>
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<td>All Units</td>
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<td>X</td>
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<td>X</td>
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<td>X</td>
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