



CONSERVATION ENHANCEMENT ACTIVITY

E666E

**CONSERVATION
STEWARDSHIP
PROGRAM**

Reduce height of the forest understory to limit wildfire risk

Conservation Practice 666: Forest Stand Improvement

APPLICABLE LAND USE: Forest

RESOURCE CONCERN: Plants

ENHANCEMENT LIFE SPAN: 10 Years

Enhancement Description:

Forest stand improvement that manages forest structure to reduce the risk of wildfire, and creates conditions that facilitate prescribed burning. The fire risk reduction is accomplished by reducing the height of the woody understory and midstory, creating space between the ground cover and the tree canopy. This enhancement provides for management of the understory vegetation in a forested area, using mechanical, chemical or manual methods to improve the plant species mix and the health of the residual vegetation, and reduce the risk of wildfire. In appropriate stands, the treatment creates conditions that favor prescribed burning. Forest stand improvement (FSI) activities are used to remove trees of undesirable species, form, quality, condition, or growth rate. The quantity and quality of forest for wildlife and/or timber production will be increased by manipulating stand density and structure. These treatments can also reduce wildfire hazards, improve forest health, restore natural plant communities, and achieve or maintain a desired native understory plant community for soil health, wildlife, grazing, and/or browsing.

Criteria:

States will apply general criteria from the NRCS National Conservation Practice Standard Forest Stand Improvement (Code 666) as listed below, and additional criteria as required by the NRCS State Office.

- The enhancement will be applied to sites which have an uncharacteristically dense understory of shrubs and small trees that limit development of ground cover.



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- Develop or update a forest management plan in consultation with NRCS personnel and a professional forester to direct the management of the property.
- Describe the current and desired future condition of each stand that will be treated. Include the species, cover type, and size-class distribution. Stocking will be described in terms of crop trees per acre, basal area per acre, trees per acre, between-tree spacing, or by any other appropriate and professionally accepted density or stocking protocol.
- Identify and retain preferred tree and understory species to achieve all planned purposes and landowner objectives.
- Use available guidelines for species and species groups to determine spacing, density, size-class distribution, number of trees, and amount of understory species to be retained. Schedule treatments to avoid overstocked conditions using approved silvicultural/stocking guides.
- Vegetation may be treated by chemical methods such as spraying or single stem treatments, or mechanical methods like a heavy-duty brush cutter or similar equipment. Refer to criteria in NRCS Conservation Practice Standard Integrated Pest Management (Code 595), Brush Management (Code 314), or Herbaceous Weed Control (315).
- Time tree felling to avoid buildup of insect or disease populations.
- Implement forest stand improvement activities in ways that avoid or minimize soil erosion, compaction, rutting, and damage to remaining vegetation, and that maintain hydrologic conditions. Protect site resources by selecting the method, felling direction and timing of tree felling, and heavy equipment operation. For temporary access use NRCS Conservation Practice Standard Forest Trails and Landings (Code 655), to protect soil and site resources from vehicle impacts.
- Where slash and debris will be generated, use NRCS Conservation Practice Standard Woody Residue Treatment (Code 384) to appropriately treat slash and debris, as necessary, to assure that it will not present an unacceptable fire, safety, environmental, or pest hazard. Remaining woody material will be placed so that it does not interfere with the intended purpose or other management activities. Do not burn vegetative residues except where fire hazard or threats from diseases and insects are of concern or when other management objectives are best achieved through burning. When slash and other debris will be burned onsite use NRCS Conservation Practice Standard Prescribed Burning (Code 338).
- The acres planned must have an “acceptable growing stock” level of at least the B line on an appropriate stocking chart.



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- This enhancement requires implementation of the following activities (a through d) in the area where the enhancement applies.
 - a. Excessive volatile live vegetation and woody debris – When volatile, live grasses and shrubs and/or woody debris are present, a reduction of these fuels may be accomplished by using heavy duty brush cutters or similar equipment.
 - b. Closed canopy – When trees form a continuous closed canopy, thin the stand to allow for heat escape and to improve the health of residual trees and understory vegetation. Open the canopy by cutting or killing selected trees to allow sunlight to reach the forest floor. Reduce slash from the cut trees by cutting off the limbs as needed. An alternative is to use single tree injections to reduce the density of poor-quality trees and open up the canopy.
 - c. Ladder fuels – When ladder fuels form connections between the ground and the higher levels of the canopy, thus increasing the risk of fire spreading into tree crowns, break the continuity of fuel between the ground and the upper canopy. Complete removal is not required as long as the continuity is disrupted.
 - d. Undesirable Vegetation – Use control measures to reduce or eliminate undesirable vegetation and favor desirable vegetation for the site.
- Minimize damage to residual trees during the treatment process.
- If machinery is being used, operate under dry conditions when the machinery will not cause rutting and/or soil compaction.
- The enhancement will comply with all applicable federal, state, and local laws and regulations, and with States’ Forestry Best Management Practices for Water Quality.



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Documentation and Implementation Requirements:

Participant will:

- Prior to implementation, work with a professional forester to develop or update a forestry management plan for the property.
- Prior to implementation, work with a professional forester to include **current** species, cover type, and size class distribution for stands to be treated in the plan.
- Prior to implementation, work with a professional forester to include **current** crop trees per acre, basal area per acre, trees per acre, between-tree spacing, or by any other appropriate and professionally accepted density or stocking protocol for stands to be treated in the plan.
- Prior to implementation, work with a professional forester to include **desired** species, cover type, and size class distribution for stands to be treated in the plan.
- Prior to implementation, work with a professional forester to include **desired** crop trees per acre, basal area per acre, trees per acre, between-tree spacing, or by any other appropriate and professionally accepted density or stocking protocol for stands to be treated in the plan.
- Prior to implementation, work with a professional forester to include in the updated or developed plan to identify and retain preferred tree and understory species to achieve all planned purposes and landowner objectives to get from **current to desired** conditions for the stands to be treated. This would be part the silviculture prescription.
- Prior to implementation, work with a professional forester using available guidelines for species and species groups to determine spacing, density, size-class distribution, number of trees, and amount of understory species to be retained to get from **current to desired** conditions for the stands to be treated. This would be part the silviculture prescription.
- Prior to implementation, work with professional forester and NRCS to delineate on a map the treatment areas and dates.
- Prior to implementation, discuss with professional forester or NRCS if NRCS Conservation Practice Standard Forest Trails and Landings (Code 655) will be necessary for access or to reduce erosion from vehicles/equipment.
- Prior to implementation, discuss with professional forester and NRCS if NRCS Conservation Practice Standard Woody Residue Treatment (Code 384) to appropriately treat slash and debris.
- Prior to implementation, discuss with professional forester and NRCS if NRCS Conservation Practice Standard Prescribed Burning (Code 338) to appropriately treat slash and debris.
- During implementation, notify NRCS of any planned changes to verify they meet the enhancement criteria.



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- During implementation, keep evidence to support the treatment activities were completed using representative photos. Location of representative photos must be indicated on the map delineating treated areas.
- After implementation, notify NRCS that treatment has been completed and submit pictures and map to support this.

NRCS will:

- Prior to implementation, provide and discuss with participant, as needed, NRCS Conservation Practice Standards Forest Trails and Landings (Code 655), Woody Residue Treatment (Code 384), and Prescribed Burning (Code 338).
- Prior to Implementation, verify that participant plan has been developed or updated by a professional forester.
- Prior to implementation, verify that participant plan has been developed or updated by a professional forester to include **current** species, cover type, and size class distribution for stands to be treated.
- Prior to implementation, verify that participant plan has been developed or updated by a professional forester to include **current** crop trees per acre, basal area per acre, trees per acre, between-tree spacing, or by any other appropriate and professionally accepted density or stocking protocol for stands to be treated.
- Prior to implementation, verify that participant plan has been developed or updated by a professional forester and includes **desired** crop trees per acre, basal area per acre, trees per acre, between-tree spacing, or by any other appropriate and professionally accepted density or stocking protocol for stands to be treated.
- Prior to implementation, verify that participant plan has been developed or updated by a professional forester and includes **desired** crop trees per acre, basal area per acre, trees per acre, between-tree spacing, or by any other appropriate and professionally accepted density or stocking protocol for stands to be treated.
- Prior to implementation, verify that participant plan has been developed or updated by a professional forester and identifies and retains preferred tree and understory species to achieve all planned purposes and landowner objectives to get from **current to desired** conditions for the stands to be treated. This would be part the silviculture prescription.
- Prior to implementation, verify that participant plan has been developed or updated by a professional forester and uses available guidelines for species and species groups to determine spacing, density, size-class distribution, number of trees, and amount of understory species to be retained to get from **current to desired** conditions for the stands to be treated. This would be part the silviculture prescription.



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- Prior to implementation, assist the landowner, as needed, to delineate on a map the treatment areas and dates of treatment.
- During Implementation, verify any planned changes in plan will meet the enhancement criteria.
- After Implementation, verify that the treatment has been completed and meets enhancement criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

NRCS Technical Adequacy Signature

Date



WASHINGTON SUPPLEMENT TO CONSERVATION ENHANCEMENT ACTIVITY

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E666E

Additional Criteria for Washington

- In addition to the criteria specified in the National job sheet E666E the following additional criteria apply in Washington:
 - Work with a forester or natural resources professional to update your forest management plan. In addition, the participant should consult with a forester or natural resources professional for guidance on how to: inventory forests, mark cut or leave trees to achieve the objective, control undesirable species and lay out and/or stake the boundaries of the treatment areas.
 - In WA, minimum acceptable growing stock levels for a fully stocked stand are determined by Forestry Technical Note 10 Table 1 (FOTG, Section I). These stand density guidelines are based on species and shade tolerance. Conifers and hardwood species listed in Forestry Technical Note 10 have commercial markets. Table 1 will be helpful in determining appropriate spacing guidelines, if timber production with generally good forest health are the top priorities. If other ecosystem services (such as wildlife habitat, wildfire risk reduction, drought resistance, carbon storage, grazing... and others) are the priority objectives or non-commercial species are preferred then Table 2 will provide more flexibility in achieving objectives.
 - Site suitability for plants can be found in WebSoil Survey in a several soils reports - Ecological Site Descriptions (ESD), Forest Productivity, and Rangeland and Forest Vegetation Classification. Natural Heritage Program ecosystems of WA or USFS plant associations may be substituted for ESDs, if ESDs are unavailable. These documents and reports may provide appropriate cover for understory species.
 - Pruning overstory tree branches is helpful in disrupting continuity of ladder fuels. Use Conservation Practice Standard for 660 Tree & Shrub Pruning (FOTG, Section IV) for guidance in successfully pruning trees for reduction of ladder fuels. To manage ladder fuels the bottom of the crowns should be at least 3 times the height of the ground fuels (slash and vegetation) plus the height of the ground



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fuel. If height ground fuels (shrubs, grasses, forbs and slash) is 2' then the minimum pruning height (live and dead branches from ground to base of crown or unpruned branches) would be 8'. Ground fuel height is 2' times 3 equals 6'. 6' plus the ground fuel height of 2' equals 8'.

- Whenever chemicals are being used, determine the risk rating of the proposed chemical by running the on-line version of WINPST. For help with WINPST consult your local NRCS Field Office.
- Based on WebSoil Survey soil suitabilities and limitations, protect soils sensitive to rutting, compaction and erosion, by using machinery only when the soil is dry or frozen, managing water runoff on the road surface, and/or vegetating the roads, trails and landing. All work done on Forest roads will be in compliance with WA Forest Practices Regulations (See WAC 222-24 and guidelines in Board Manual Section III).
- Use the Conservation Practice 384 Woody Residue Treatment Specification Guide (FOTG, Section IV), USFS forest residue photo series, or use some other professionally accepted protocol for estimating the amount of down wood on site and/or created by silviculture activities. In fire prone areas (dry forests) keep down woody debris (forest slash) to 9 tons/acre or less. The 9 tons will be lopped and scattered and < 2' in height. The woody debris should be distributed across the site and break continuity in order to disrupt the spread of a fire. Woody debris amounts greater than 9 tons/acre will need to treated through piling, chipping, crushing or removal (See WAC 332-24-652).
- **NRCS WA does not provide technical or financial assistance for prescribed burning. See WA Dept. of Natural Resources for all assistance associated with prescribed burning such as burn plans and burn permits.**
- To reduce damage to residual crop trees, avoid thinning from March 1st through July 4th. **To avoid exacerbating *Ips* beetle populations in pine stands do not thin until after August 1st and before January.** Do not pile slash until it is dried out and is no longer habitat for *Ips*. See USFS FIDL 122 for treatment alternatives.
- Consider mitigation for wildlife habitat, which may include habitat piles or increasing pruning heights in areas where the understory vegetation heights are left higher for wildlife cover. Ask NRCS for acceptable habitat pile design and



strategic placement for wildlife habitat and reduction of wildfire hazard. (Refer to Woodland Fish and Wildlife publication- Wildlife-Friendly Fuels Reduction in Dry Forests of the Pacific Northwest.)

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Additional Documentation Requirements for Washington

- In addition to the documentation requirements specified in the National job sheet E666E the following additional documentation requirements apply in Washington:
 - Provide Implementation Requirements for Forest Stand Improvement (666) which includes overstory tree data, document the pre- and post treatment understory species composition, condition and cover of the main understory species.
 - Document current and post treatment forest residue/fuel loading. Also document which method was used for estimating the amount of forest residue.
 - WINPST risk rating reports for any chemicals used and their labels.
 - Document any mitigations methods and protocols, use to protect wildlife habitat.
 - Document WA Forest Practice Application requirements have been met.