



**CONSERVATION ENHANCEMENT ACTIVITY
E666134Z**

**CONSERVATION
STEWARDSHIP
PROGRAM**

**Enhance development of the forest understory to create
conditions resistant to pests**

Conservation Practice 666: Forest Stand Improvement

APPLICABLE LAND USE: Forest

RESOURCE CONCERN ADDRESSED: Degraded Plant Condition

ENHANCEMENT LIFE SPAN: 10 Years

Enhancement Description:

Forest stand improvement that manages the structure and composition of overstory and understory vegetation to reduce vulnerability to damage by insects and diseases of forest trees. Managing the understory vegetation will also reduce the risk of wildfire, and promote development of herbaceous plants that benefit wildlife. 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. These practices encourage the development of a less dense forested ecosystem. The canopy gaps and open understory allow for air circulation that reduces the incidence of disease, and the improved health of the residual trees increases their ability to withstand insect attacks. 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.

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



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- The acres planned must have an “acceptable growing stock” level of at least the B line on an appropriate stocking chart.
- 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.



Documentation and Implementation Requirements:

Participant will:

- Prior to implementation, review NRCS Conservation Practice Standard Forest Stand Improvement (Code 666) which contains information needed to meet criteria for this enhancement.
- Prior to implementation, develop an understanding of management practices that reduce a dense understory of small trees and brush, and the types of understory vegetation that will be encouraged by these practices. (Request NRCS technical assistance, as needed.)
- Prior to implementation, work with a professional forester to prepare or update a current Forest Management Plan (FMP) that includes activities required to implement this enhancement. The FMP will include guidelines for thinning the stand and maintaining fully stocked conditions as specified in enhancement criteria. The FMP will also include recommended practices for managing understory vegetation to minimize risks of insect and disease outbreaks.
- Prior to implementation, recognize that other NRCS Conservation Practice Standards may be needed to apply this enhancement. These may include:
 - Forest Trails and Landings (Code 655)
 - Integrated Pest Management (Code 595)
 - Woody Residue Treatment (Code 384)
 - Prescribed Burning (Code 338)
- Prior to implementation, acquire all necessary approvals and permits (i.e. local, state, or federal, as applicable).
- Prior to implementation, work with a professional forester who will mark trees and groups of trees to be removed or killed, and will develop a strategy for controlling undesirable understory vegetation.
- Prior to implementation, take pre-treatment photos of the site to show representative conditions.
- During implementation, follow FMP guidelines, criteria in NRCS Conservation Practice Standard Forest Stand Improvement (Code 666), and specifications provided by NRCS, to ensure that:
 - Trees are removed, killed, or retained to achieve all planned purposes and landowner objectives.

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- The desired spacing, density, size-class distribution, number of trees, and amount of understory is achieved.
- The operation avoids or minimizes damage to desirable vegetation.
- During implementation, follow state-approved Forestry Best Management Practices (BMPs) to protect streams, water quality, and minimize soil loss.
- During implementation, reduce stand stocking to correspond with the B-line of an appropriate stocking chart, retaining trees with larger, healthy crowns and undamaged trunks. If tree removal is not an option, reduce density by killing selected trees through girdling and/or chemically treatments.
- During implementation, control undesirable competing vegetation using appropriate methods for the tree species and site conditions. If prescribed burning will be used, work with NRCS and a professional forester or biologist to obtain a state approved prescribed burn plan. If using chemical methods, follow application and timing recommendations from an approved source.
- During implementation, limit the size of debris piles to minimize wildfire hazards.
- During implementation, as needed, evaluate and review with NRCS any planned changes to verify they meet the enhancement criteria.
- After implementation, take digital photos showing representative post-treatment conditions.
- After implementation, notify NRCS that the work has been completed and make treatment documentation records available for NRCS review and certification.

NRCS will:

- Prior to implementation, provide assistance with interpretation of a current or updated FMP for sites where this enhancement will be applied.
- Prior to implementation, provide and explain the following NRCS Conservation Practice Standards as they relate to implementing this enhancement.
 - Forest Stand Improvement (Code 666)
 - Woody Residue Treatment (Code 384)
 - Forest Trails and Landings (Code 655)
 - Integrated Pest Management (Code 595)
 - Prescribed Burning (Code 338)



- Prior to implementation, provide and explain the state's Forestry BMP guidelines.
- During implementation, provide technical assistance if requested by the participant.
- During implementation, evaluate any planned changes to verify they meet the enhancement criteria.
- During implementation, provide technical assistance if requested by the participant.
- After implementation, review treatment documentation records and certify that the enhancement was completed according to specifications in this enhancement, and in NRCS Conservation Practice Standard Forest Stand Improvement (Code 666).

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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 _____



**INDIANA SUPPLEMENT TO
CONSERVATION ENHANCEMENT ACTIVITY**

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E666134Z

Additional Criteria for Indiana

In addition to the criteria specified in the National job Sheet E666134Z the following addition criteria apply to Indiana:

- Livestock must be excluded from all forested acres enrolled for this enhancement.
- When felling trees >5" DBH, follow all *USFWS/NRCS Requirements for the Indiana Bat and Northern Long-Eared Bat*. This document is attached to end of the Indiana CSP Wildlife Species Guidance (2018).

Additional Documentation Requirements for Indiana

In addition to the documentation requirements specified in the National job sheet E666134Z the following additional documentation requirements apply in Indiana:

- Activities "a" and "c" are often not a resource concern in Indiana. Documentation by a NRCS personnel or professional forester is needed, if these activities are not a concern in the area where the enhancement applies.
- When a professional forester is utilized to implement the work, marking trees and groups of trees is not required.
- Woody Residue Treatment Standard (Code 384) is not adopted by Indiana NRCS and is not a requirement for treating slash and debris for this enhancement. However, assure that slash and debris does not pose an unacceptable fire, safety, environmental, or pest hazard.

Notes and comments on the National Enhancement:

- Use appropriate Gingrich stocking charts. Contact NRCS State Forester with questions. Other appropriate stocking charts or tables can be used to determine the acceptable growing stock level (B line stocking), as described in the National job sheet criteria.
- Not Compatible with: E666118Z, E666115Z2, E666135Z1, E666137Z7, E666119Z, E666133X, E666132Z2 , E666136Z2, E314133Z, E314134Z