

# Climate-Smart Agriculture and Forestry Mitigation Activities – FY25

USDA-NRCS Climate Office | October 2024

FARM PRODUCTION AND CONSERVATION  
FSA | NRCS | RMA | Business Center



# NRCS Mission

- Delivers conservation solutions so farmers, ranchers, and private forest landowners can protect natural resources and feed a growing world.
- Keep working lands working
- Boost rural economies
- Improve the quality of our air, water, soil, and habitat.



# Forestry GHG Quantification

- IRA funds – implement climate mitigating practices and enhancements that reduce GHG emissions or increase carbon storage
- Report to Congress annually
- Comet quantifies carbon storage for Tree-Shrub Establishment and agroforestry practices
- No system for quantify GHG benefits for silvicultural treatments



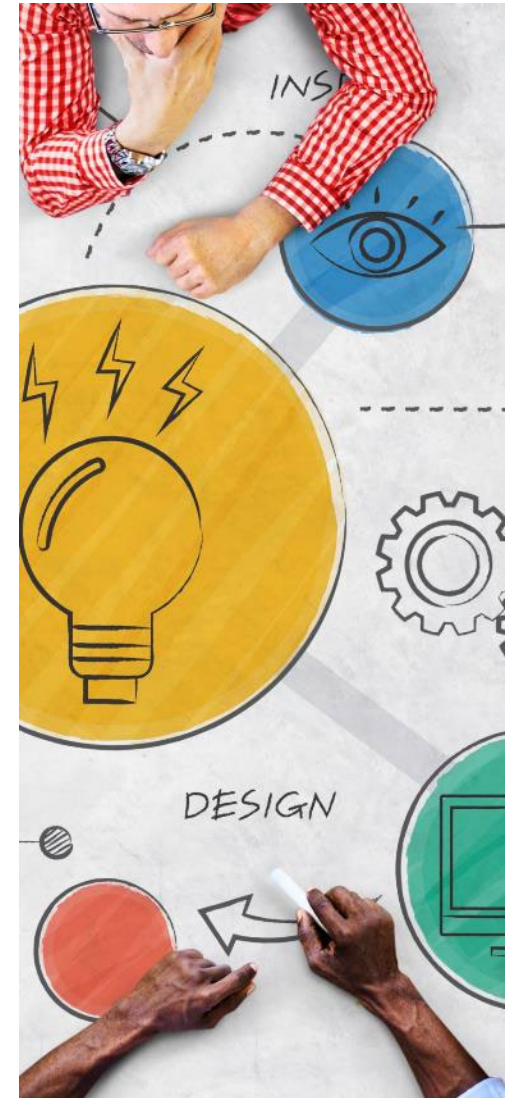
# CSAF Mitigation Activity Evaluation Criteria

## Criterion 1

- Is the activity expected to result in direct impact on ... net greenhouse gas emission reduction or removal within a given scope...as supported by the scientific literature?

## Criterion 2

- Does NRCS have a science-based approach for quantitatively estimating mitigation benefits using available NRCS activity data?







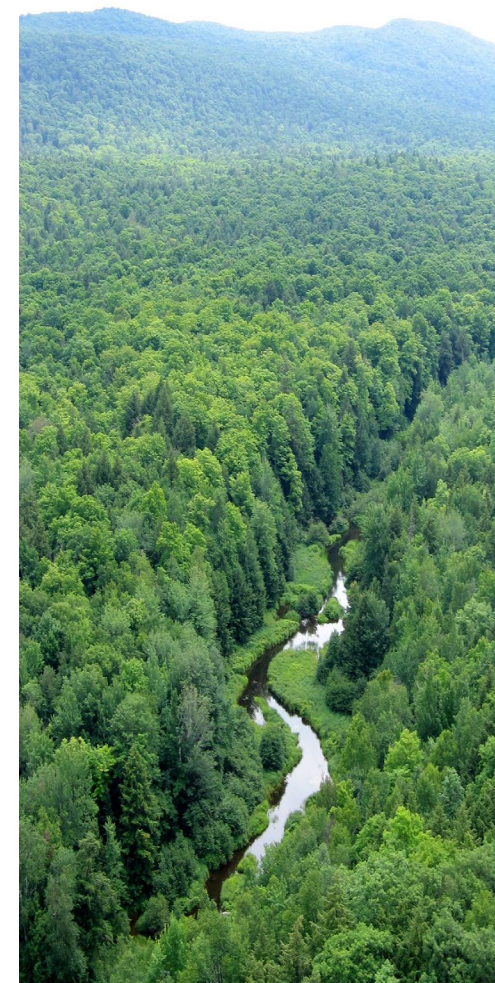
# Entity Guideline Use

## Criterion 1

- Determine if current science indicates Forest Stand Improvement, Fuel Break, and Woody Residue are climate mitigating and under what circumstances

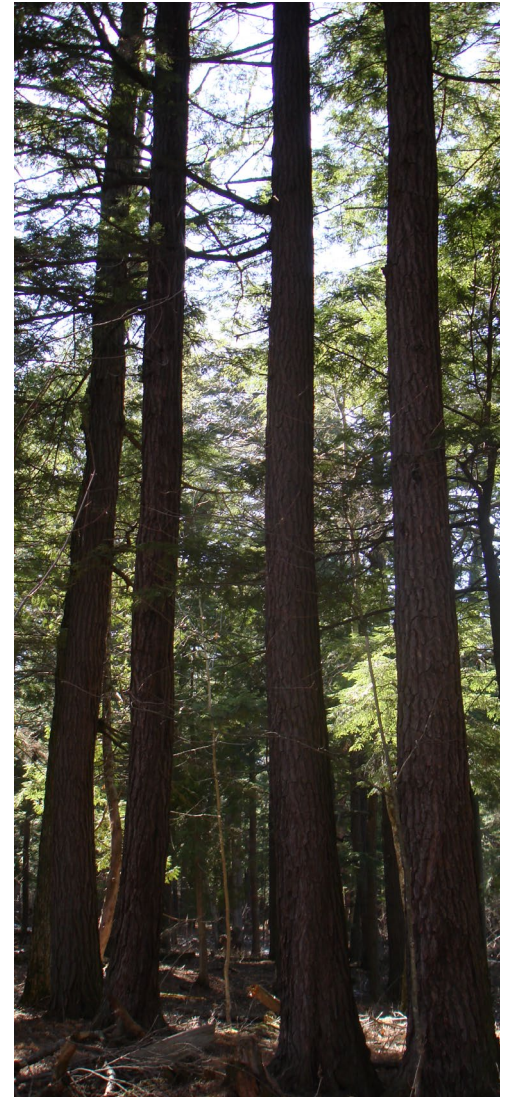
## Criterion 2

- Multi-agency scientific panel – evaluated the Entity Guidelines Managed Forests Systems and determined it can be used to quantify carbon benefits of Forest Stand Improvement, Fuel Break, and Woody Residue Treatment.



# NRCS Use case

- To meet our second criterion, estimation approaches rely on regional values generated using Excel Workbook V1.0
- Coarse program-level estimates lack site-specific data, assumptions around implementation of the practice across geographies is needed





# NRCS Use case

- East: Carbon stocks and flux in eastern forests are estimated using the Detailed Ecosystem Carbon Scenario Projection within Workbook
  - “Basic Projection” forest management activity “Level 1” quantification approach is applied. For each Eastern region, estimates are based on area of treatment, the “unknown” forest type, stand origin, and age class to render average estimates.
- West: Avoided carbon emissions in western forests are based on simulations of fire emissions using Fire Results within Workbook
  - Estimates are based on the area of treatment, and the “unknown” forest type is selected to render average estimates across forest type groups in the selected region for moderate severity fire and applying a recurrent probability discount value.



# Entity Guideline Strengths

- Allows NRCS to quantify carbon benefits for three forestry practices
- Other quantification methods are limited to specific forest types or conditions
- Excel workbook is easy to use





# Entity Guideline Weakness

- Silvicultural treatment options do not align with NRCS Forest Stand Improvement usage
- NRCS needs to improve conversion of state data for national reporting



# Entity Guideline – Next steps

- Projections around BAU scenarios – what would projected carbon stocks look like in absence of forest management/Forest Stand Improvement (CPS 666)?
- Methods for silvicultural practices aligned with NRCS Conservation Practice Standards, such as Forest Stand Improvement, Woody Residue Treatment, and Fuel Break





# Resources - Public Information Dashboard



## NRCS Conservation Practices and Greenhouse Gas Mitigation Information

Select the NRCS Practice of Interest

Forest Stand Improvement



[Download Summary PDF](#)

### Forest Stand Improvement (666)

**Specific Implementation (when applicable):** Not applicable

**Summary of Expected Mitigation Benefits:** Enhanced carbon storage in forests and avoided wildfire emissions. Selected references: Kalies et al., Kern et al., 2021; 2016; Ontl et al., 2020

**Greenhouse Gases Mitigated:** Carbon dioxide (CO<sub>2</sub>), Methane (CH<sub>4</sub>), Nitrous Oxide (N<sub>2</sub>O)

**Estimation Approach:** Estimation methods are dependent on the region where the practice is implemented. Carbon stocks and flux in eastern forests are estimated applying the “Level 1” quantification methodology as described in the Managed Forest Systems chapter in the USDA Quantifying Greenhouse Gas Flux in Agriculture and Forestry: Methods for Entity-Scale Inventory and are based on regional averages for any combination of forest type group, stand origin, age class variables from U.S. Forest Service Forest Inventory and Analysis (FIA) data. Avoided carbon emissions in western forests are based on simulations of fire emissions combining Forest Service Treemap Data and the Forest Service Forest Vegetation Simulator (FVS) Fire and Fuels Emissions (FFE) extension reflecting medium severity burns based on expected tree mortality and grouped by region and forest type.

**NRCS Key Estimation Assumptions:** Forest Stand Improvement practices in Eastern states, the “Basic Projection” forest management activity “Level 1” quantification approach is applied. For each Eastern region, estimates are based on area of treatment, the “unknown” forest type, stand origin, and age class to render average estimates reflecting relevant forest type groups, stand origin and age class for the selected region. For each Western region, estimates are based on the area of treatment, and the “unknown” forest type is selected to render average estimates across forest type groups in the selected region. As avoided emissions from wildfire only occur if fire occurs on the treated area, a conservative estimate of “potential avoided emissions” will be reported reflecting a “moderate severity” fire scenario and a recurrent probability discount value will be applied as a conservative approach.

#### Select References Cited:

Kalies, E. L., Haubensak, K. A., & Finkral, A. J. (2016). A meta-analysis of management effects on forest carbon storage. *Journal of Sustainable Forestry*, 35(5), 311–323.  
<https://doi.org/10.1080/10549811.2016.1154471>

Kern, C. C., Kenefic, L. S., Kuehne, C., Weiskittel, A. R., Kaschmitter, S. J., D'Amato, A. W., ... & Schuler, T. M. (2021). Relative influence of stand and site factors on aboveground live-tree carbon sequestration and mortality in managed and unmanaged forests. *Forest Ecology and Management*, 493, 119266.

Ontl, T. A., Janowiak, M. K., Swanston, C. W., Daley, J., Handler, S., Cornett, M., Hagenbuch, S., Handrick, C., McCarthy, L., & Patch, N. Forest Management for Carbon Sequestration and Climate Adaptation, *Journal of Forestry*, 2020. Vol 118, No. 186-101.

Murray, L.T., C. Woodall, A. Lister, K. Stockmann, H. Gu, Urbanski, S., Riley, K., Greenfield E., et al. (2024). Chapter 5: Quantifying greenhouse gas sources and sinks in managed forest systems. In Hanson, W.L., C. Itie, K. Edquist. (eds.). *Quantifying greenhouse gas fluxes in agriculture and forestry: Methods for entity-scale inventory*. Technical Bulletin Number 1939, 2nd edition. Washington, DC: U.S. Department of Agriculture, Office of the Chief Economist.

Stockmann, K., A. Lister, L. Murray, C. Woodall, P. Nepal, J. Smith, H. Gu, P. Khatri, S. Urbanski, K. Riley, J. Shaw. 2024. *USDA Greenhouse Gas Flux Entity-Scale Guidelines for Managed Forest Systems Level 1 Workbook Tool (Version 1.0)*

# Resources – FAQs

- [External FAQs](#) available to public; posted on NRCS web
  - <https://www.nrcs.usda.gov/our-agency/faqs-climate-smart-agriculture-and-forestry-mitigation-activities-and-inflation>

#### 4. Why does NRCS no longer list certain practices as “provisional,” as was done in FY23 and FY24?

In FY23 and FY24, some practices were designated as “provisional” because they were expected to provide mitigation benefits (they met criterion 1, per the requirement of the Inflation Reduction Act). However, quantification of those benefits had not yet been incorporated into NRCS reporting activity data (i.e., did not meet criterion 2 at the time). This led to confusion. To avoid further confusion, the designation of “provisional” will no longer be used for FY25 and beyond, because all listed practices are expected on average to provide a direct impact resulting in net greenhouse gas emission reduction or removal as supported by the scientific literature. NRCS is continually working to improve its ability to quantitatively estimate the benefits of its Climate-Smart Agriculture and Forestry Mitigation Activities. Additional information about each listed practice can now be found on the [NRCS Conservation Practices and Greenhouse Gas Mitigation Information dashboard](#). NRCS will continue to update this dashboard as additional scientific literature and data become available.

#### 5. What does it mean if a practice is listed with a specific implementation?

This means the practice is considered a mitigation activity only when implemented in a specified way. These are described in the [Climate-Smart Agriculture and Forestry Mitigation Activities list](#).