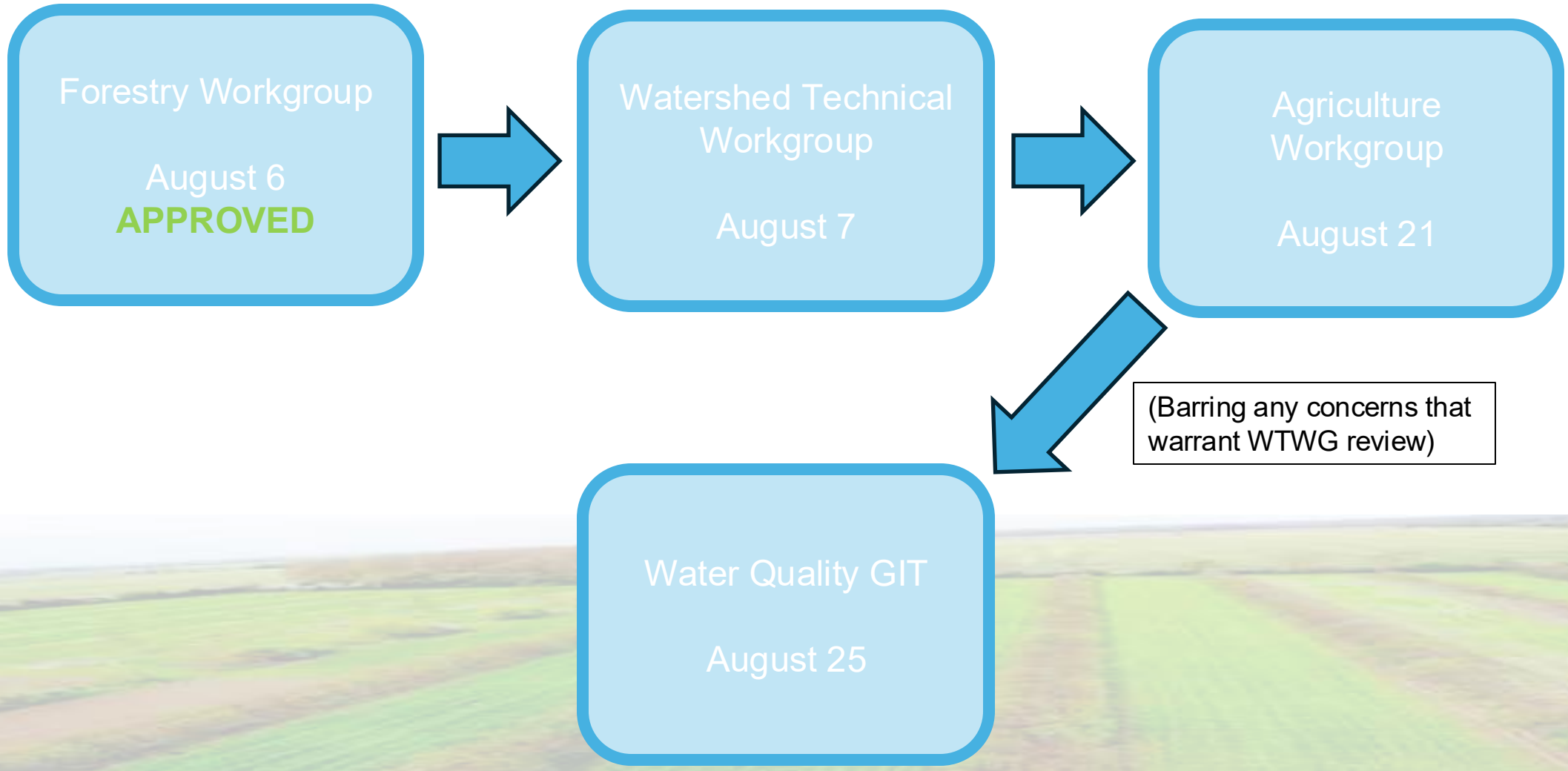
Agroforestry Expert Panel Establishment Group (EPEG): Request for Approval of Recommendations

Katie Brownson, USFS CBPO, FWG Coordinator

Eric Hughes, EPA CBPO, AgWG Coordinator

Proposed Decision Path



Who was involved?

Name	Affiliation
Approved Members	
John Fike	Virginia Tech
Brett Chedzoy	Cornell University Cooperative Extension
Elizabeth Hoffman	Maryland Dept. of Agriculture
Nick Miller	Maryland Dept. of Agriculture
Mark Batcheler	United States Forest Service - National Agroforestry Center
Robbie Coville	Pennsylvania Department of Conservation and Natural Resources - Bureau of Forestry
Joshua Greene	Trees For Graziers
Advisors and Regularly Consulted Parties	
Joe Alley	USDA - Natural Resources Conservation Service, *National Agroforester*
Aaron Hird	USDA - Natural Resources Conservation Service, *Pastureland Assessment Leader, CEAP for Grazing Land*
Support Staff	
Katie Brownson	United States Forest Service - CBPO
Ruth Cassilly	University of Maryland - CBPO
Mark Dubin	University of Maryland - CBPO
Eric Hughes	United States Environmental Protection Agency - CBPO
Olivia Devereux	Devereux Consulting - CBPO
Helen Golimowski Smith	Devereux Consulting - CBPO
Jessica Rigelman	J7 Consulting - CBPO

Major findings and recommendations

- Research supports crediting these practices for their water quality benefits if established critical management protocols are followed
- Recommend crediting as an efficiency BMP
- Efficiency reductions derived by simulating the conversion of 25% of the practice area into a forested loading rate (**using loading rates previously established by partnership for forests**), but practice area will stay in the original agricultural land use.
- Crediting will allow stacking of management BMPs such as nutrient management, conservation tillage, alternative pasture watering, etc. on same acreage
- Crediting requires that silvopasture be stacked with Precision Intensive Rotational/Prescribed grazing and that credit only be provided for adding trees to pasture (not removing trees from forest)
- **Recommend a 10-year credit duration** with directive to revisit crediting methods for these practices at the end of this period or earlier (from whatever Progress year starts the reporting)

Decision: 25% mature canopy minimum requirement for both practices

Rationale: Practice variability, similar criteria in terms of site design options, usage, light requirements for forages/crops

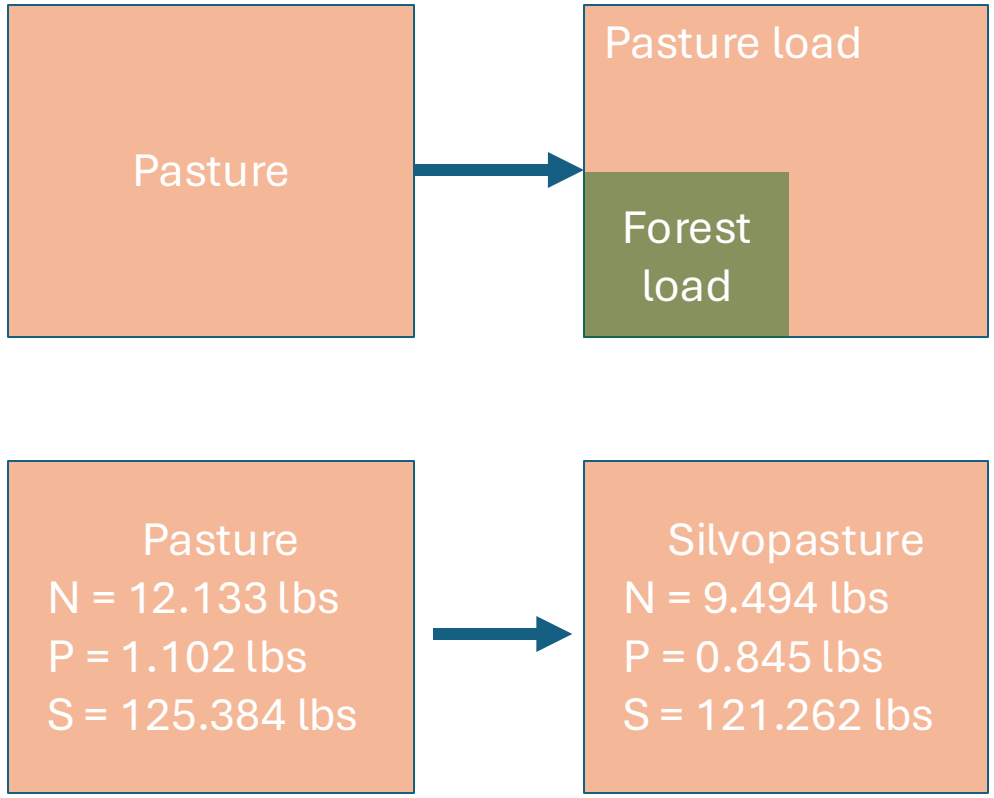
25%-35%: covers estimated minimum light needs for warm season grasses and variability of silvopasture and alleycropping system design

% mature canopy minimum translated to TPA (Trees per Acre):

- **Small trees/shrubs**: 20 ft-wide canopies at 20 x 60 ft spacing equals **36 TPA**
- **Large trees**: 30 ft-wide canopies at 30 x 60 ft spacing equals **16 TPA**

Silvopasture — Deriving the Efficiency N=21.75% P=23.36% S=03.29%

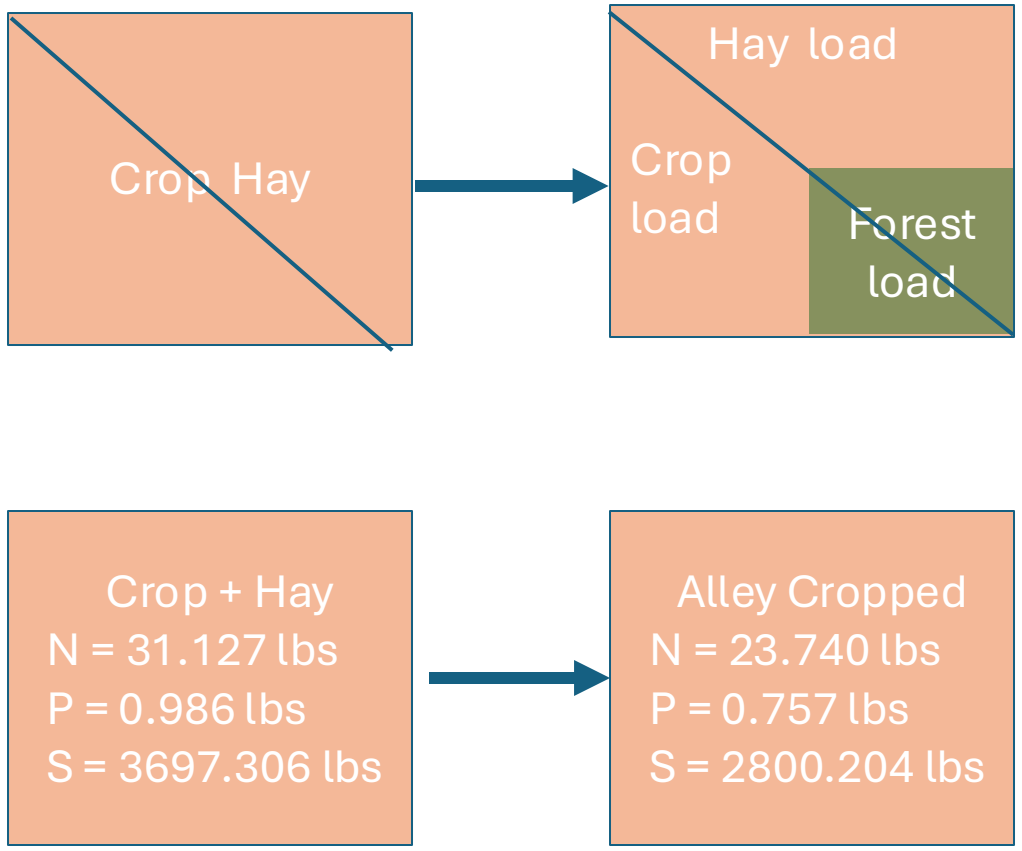
- Definition: Establishment *and management* of desired trees and forages *on pasture*.
- Eligible on the pasture land uses (not on currently forested land uses)
- Reduce load from 25% of the area to the forested land use load and keep the remaining 75% of the area at the existing land use load
- Acres remain as pasture and are not shifted to a new land use category
- Report for the entire field area
- These reductions are separate from the Precision Intensive Rotational/Prescribed Grazing BMP efficiency reduction credit



Graphics courtesy of Olivia Devereux

Alley Cropping — Deriving the Efficiency N=23.73% P=23.16% S=24.26%

- Definition: Trees or shrubs planted in sets of single or multiple rows *integrated* with agronomic, horticultural crops or forages produced in the alleys between the sets of woody plants that produce additional products.
- Eligible on the crop and hay land uses, efficiency calculated as the average load of crop and hay land uses
- Reduce load from 25% of the area to the forested land use load and keep the remaining 75% of the area at the existing land use load
- Acres remain as crop or hay and are not shifted to a new land use category
- Report for the entire field area



Graphics courtesy of Olivia Devereux

Efficiency Value Comparison: Research vs. CAST

- **Water quality improvements documented in the literature review:**
  - **Silvopasture: average reductions:**
    nutrient leaching losses (45%), sediment (42%), surface runoff (47%)
    [ranges: runoff (45–88%), soil losses (45–88%), (N –150–92%), P (– 48-91%)]
    average nutrient removal efficacy in North America of 45% (Zhu et al. 2020 meta-analysis)

  - **Alley Cropping**: Agroforestry buffer strips showed
    TN reductions 20-94%, TP reductions 17-91%, sediment reductions 0-97% (Tsonkova et al 2012 meta-analysis), lower values are coming from studies measuring reductions within the first 3-years post planting.

- **CAST Efficiency Reductions:**
  - **Silvopasture: N=21.75% P=23.36% S=03.29%**
  - **Alley Cropping: N=23.73% P=23.16% S=24.26%**

Where we are in the EPEG Process

Request from WG to evaluate a BMP:

1. Agroforestry EPEG Charge approved by FWG, AgWG, WQGIT **May 2024**
2. Formed EPEG: member approval, orientation, gather research/information for BMP evaluation- **August 2024**

**Request was sent to the Water Quality GIT for review*

STEP 1

Consensus: BMP definitions and water quality benefits, crediting, produce EPEG report recommendations **June/July 2025**

******E.g., if BMP is comparable to previously approved BMPs, lacks sufficient available scientific data, is comparable to another panel request, etc.***

STEP 2

Expert Panel (EP) is recommended & formed to establish BMP credit

Expert Panel (EP) is NOT recommended:

EPEG Report: efficiency credit recommended

STEP 3: Must be approved by AgWG, Forestry WG, WTWG, WQGIT

August/September 2025

Any Questions or Concerns?

Decision Requested:

WTWG Approval of Agroforestry EPEG technical appendix (recommendations) to establish credit for Silvopasture and Alley Cropping practices as Chesapeake Bay Program water quality BMPs in Phase 7, as outlined in the EPEG report

Reference Slides:

Review: Why was the EPEG formed?

- At the request of members of the Forestry and Agriculture Workgroups and WQGIT approval, the Agroforestry EPEG was formed in August 2024 to evaluate the NRCS Conservation Practice Standards (CPS) Silvopasture 381 and Alleycropping 311 for their water quality benefits and consider them for Chesapeake Bay Program BMP crediting

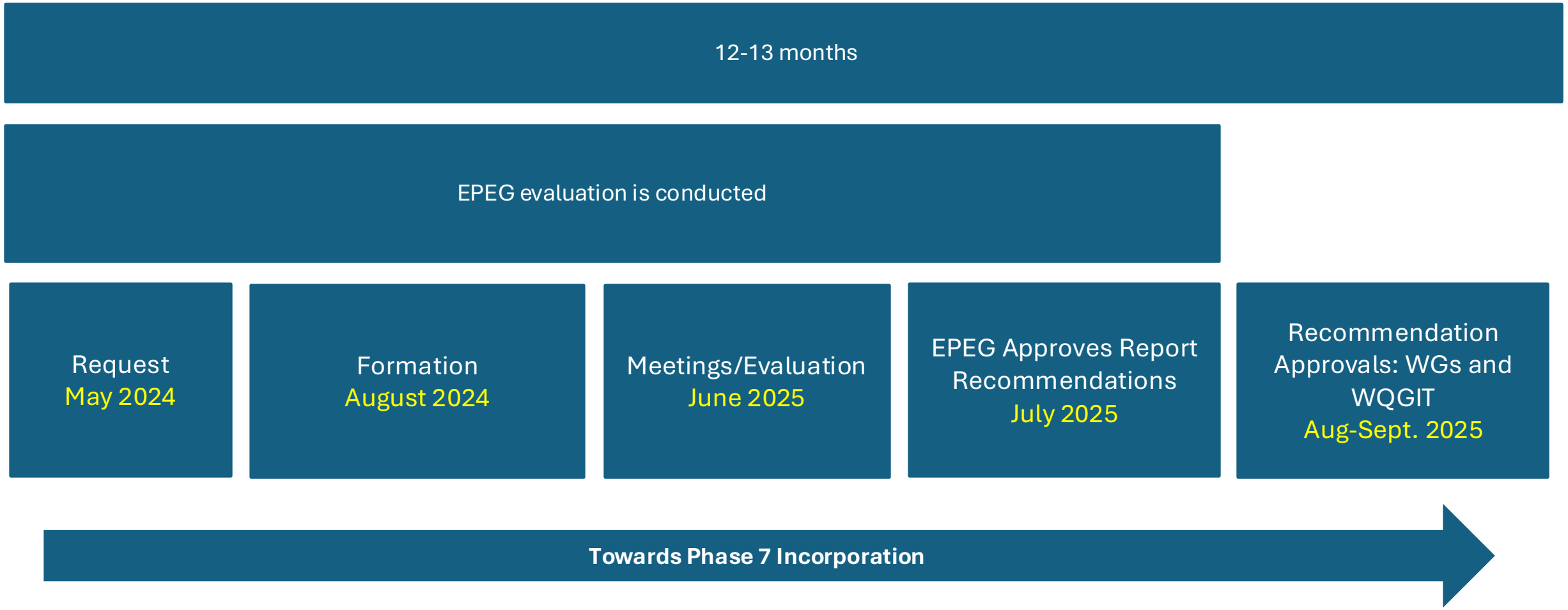
Rationale:

- USDA Forest Service Chesapeake Forest Restoration Strategy, Eastern Region State and Private Forestry | NA-IN-03-13 | Revised September 2020- Section 3 - Restoration in Agricultural Landscapes
- These practices are increasingly being implemented in most Bay jurisdictions and provide multiple benefits beyond water quality improvement, including resilience to changing environmental conditions
- In addition to NRCS support in some states, many jurisdictions have state level standards for these practices and are providing technical assistance, cost-share and grant funding towards implementation, there is also growing private sector and non-profit support

EPEG Process/Steps for Evaluating the BMPs:

Definitions	• a clear and concise definition of the practice and why an evaluation is being considered- water quality benefits
Current Science	• references to available science/data on the on the nutrient and sediment reduction efficiencies to support the request
Tracking & Reporting Info	• types of data the jurisdiction(s) currently track and report, and how the request could impact these efforts
Support for Panel	EPEG determined credit is warranted and recommended method is based on existing land-use loading rates; can but does not require the formation of an Expert Panel

Timeline Overview- EPEG Report Review and Approval



Definition of practices: Used NRCS Conservation Practice Standards as a starting point- made modifications

NRCS Practice	Altered NRCS Definition	Conditions Where Practice Applies:	Purpose
Alley cropping 311	**Trees or shrubs planted in sets of single or multiple rows integrated with agronomic, horticultural crops or forages produced in the alleys between the sets of woody plants that produce additional products.** **Key Additional Criteria for BMP**: based on existing NRCS/state practice recommendations **Crediting is based on the EPEG determination of minimum percentage of canopy coverage per acre**	On all cropland and hayland where trees, shrubs, crops, and forages can be grown in combination.	•Enhance microclimatic conditions to improve crop or forage quality and quantity. • **Reduce surface water runoff and erosion.** • **Improve soil health by increasing utilization and cycling of nutrients.** • **Alter subsurface water quantity or water table depths**. • Enhance wildlife and beneficial insect habitat. • Increase crop diversity. • **Decrease offsite movement of nutrients or chemicals**. • Increase carbon storage in plant biomass and soils. • Develop renewable energy systems. • Improve air quality.

Red text denotes changes and additional criteria the EPEG added to the existing NRCS CPS to qualify as a CBP BMP

NRCS Practice	Altered NRCS Definition	Conditions Where Practice Applies:	Purpose
Silvopasture (381)	**Establishment and management of desired trees and forages on pasture.** **Key Additional Criteria for BMP**: tree addition only, forage management, Precision Intensive Rotational/Prescribed grazing (precursor to impending NRCS change), based on NRCS/state practice recommendations **Crediting is based on the EPEG determination of minimum percentage of canopy coverage per acre**	May be applied on any pasture that is suitable for the desired forages, trees and livestock	•**Improve water quality.** •**Reduce erosion**. •Enhance wildlife habitat. •Improve biological diversity. •**Improve soil quality**. •Increase carbon sequestration and storage- Tree/Shrub planting on grazed grasslands only •Provide for beneficial organisms and pollinators.

Red text denotes changes and additional criteria the EPEG added to the existing NRCS CPS to qualify as a CBP BMP, only silvopasture establishment by the addition of trees will be credited

DRAFT Report Recommendation Summary:

- **Credit as a variation of the existing Agricultural Tree Planting BMP by establishing percent efficiency reductions for each practice,** to be applied to pasture or cropland respectively, allow stacking of cropland and pasture management BMPs on these acres
    - Establish efficiency values for both BMPs by calculating the load/acre reduction achieved when an established percentage of the crop or pasture acre is converted to a forested land-use loading rate, the calculated reduction would be subtracted from the existing cropland or pasture load/acre
    - Key qualifying criteria is the requirement for percent of canopy coverage per acre (model simulation only- no actual conversion of the land-use footprint)
    - **Recommend a 10 year credit duration** with directive to revisit crediting methods for these practices at the end of this period or earlier (from whatever Progress year starts the reporting)
    - **Revisitation** to address the current land-use misclassification (much current implementation being classified as forest harvest or suspended succession) and future conversion issue (mature trees being identified as forest in the CBP land-use imagery) and re-evaluate how the BMPs are treated in CAST

      GSAT input: in 10 years we expect significant changes in land-use imagery capabilities, may be able to map silvopasture and alley cropping BMPs explicitly and supplement with improved Ag Census data, see the conversion concern as a Phase 8 issue

Describe current capabilities: Possible to Establish as a New Land-Use with Unique Loading Rate?

- **CBP Information**: CAST land uses are load sources with unique loading characteristics supported by the literature, expert opinion, and data, need a way to estimate land-use footprint on the landscape
  - Establishing a loading rate for a new land-use for Phase 7 CAST- land uses are being considered now; finalized late summer and will be fixed for the next 6-10 years (until Phase 8).
  - Panel or Workgroup approval to assign a loading rate similar to an existing CAST land use- ex. USWG decided solar panels and pervious should load like impervious structures and turf grass, respectively.
  - **Biggest barrier**: **Phase 7 land uses need to exist for the period 1985 – 2022**, cannot identify with imagery or data- we have no Ag Census data for specific agroforestry practices on the landscape before 2022 Ag Census (privacy issues-see next slide), states and/or NRCS have some recent practice data- but this is incomplete