



Design and Implementation Activity

Soil Health Management System Design

DIA 162

Definition

Develop site-specific recommendations and designs for soil health related practices that address the four principles of soil health as identified in CPA 116 Soil Health Management Plan or a conservation plan.

REQUIREMENTS

General Requirements

A Design and Implementation Activity (DIA) assists a participant with implementing their conservation plan by providing site-specific instructions, requirements, plans, or specifications for putting conservation practices and enhancements on the land.

A DIA may involve providing assistance for a single conservation practice or a combination of structural, vegetative, or land management conservation practices, enhancements, and management activities.

Prior to initiation of the DIA, the Technical Service Provider (TSP) will schedule a conference with the participant and Natural Resources Conservation Service (NRCS) field office staff to ensure an understanding of the participant objectives (including practices to be covered by the DIA), required deliverables, and characteristics of the DIA tasks. The meeting between all parties may take place in person or virtually.

The participant and conservation planner determine which conservation practices a TSP will provide DIA assistance for. The TSP must be certified in the NRCS Registry for each practice they will help with through this DIA. If they are not certified for a specific practice, the TSP may find and use a subcontractor TSP who holds the required certification.

DIA assistance is based on the participant's conservation plan and applicable conservation practice standards and related technical guidance provided in the NRCS Field Office Technical Guide (FOTG). Each NRCS state office publishes appropriate technical guidance and reference information in the state's version of the FOTG. DIA assistance must conform with the conservation practice standards included in the FOTG, Section 4 for the state where the practice(s) will be implemented. A TSP must use conservation practice supporting documents found in the applicable state's FOTG, Section 4, to ensure adherence to state standards.

Examples of conservation practice supporting documents include statements of work (SOW), implementation requirements (IR), practice specifications (PS), standard drawings (SD), general specifications (GS), construction specifications (CS), material specifications (MS), and design support tools. The FOTG homepage hyperlink is <https://efotg.sc.egov.usda.gov/#/>.

Technical Requirements

The activity will meet the NRCS planning criteria for one or more of the following resource

concerns:

- Organic matter depletion.
- Compaction.
- Soil organism habitat loss or degradation.
- Aggregate instability.
- Concentration of salts or other chemicals.
- Plant productivity and health.
- Wind erosion.
- Sediment transported to surface water.
- Sheet and rill erosion.
- Naturally available moisture use.

Different land uses and soil types impact the soil ecosystem uniquely, causing soil health to vary. Because of this, this activity requires planning a system of conservation practices based on the four core principles of soil health, as detailed below for each land use.

Note: The term "optimize" is sometimes used instead of "maximize" or "minimize" because soil processes exist along a continuum, and more is not always better. The goal is to achieve the right balance of these principles to support healthy soils, resilient ecosystems, and sustainable land management.

- **Disturbance:** Appropriate levels of disturbance can support healthy plant and soil processes, while too little or too much disturbance can negatively affect systems.
- **Soil Cover:** Too little soil cover can increase erosion and evaporation, while excessive litter or thatch can reduce water infiltration and/or impede plant development in some systems.
- **Biodiversity:** The goal is to maintain, enhance, restore, or establish plant and soil organism communities that support desired ecosystem functions, not necessarily maximizing the number of species present.
- **Living Roots:** Living roots support biological activity, nutrient cycling, and soil structure, and management should consider site-appropriate root system types, such as tap-rooted, fibrous-rooted, and rhizomatous species, while balancing available water, nutrients, and objectives.

Cropland

- 1) **Minimize soil disturbance** by implementing conservation practices such as reducing tillage, managing irrigation, controlling traffic, managing grazing, and integrating pest management to improve soil structure and water infiltration, reduce aggregate breakdown, and protect soil organism habitat and organic matter.
- 2) **Maximize soil cover** by implementing conservation practices such as using cover crops, conservation cover, critical area seeding, and surface residue management to reduce nutrient runoff, buffer soil temperature, reduce evaporation, reduce erosion, reduce aggregate breakdown, protect soil organic matter, and provide habitat for biological organisms.

- 3) **Maximize biodiversity** using crop rotations, application of soil carbon amendments, multi-species cover crops, and livestock to improve nutrient cycling, break disease cycles, and enhance or stimulate below ground activity.
- 4) **Maximize living roots** by implementing conservation practices such as cover crops, crop rotations, and perennial crops to maximize time periods of active growth throughout the year that provide soil biota with a continuous food source.

Rangeland

- 1) **Optimize disturbance** by grazing management and prescribed fire to avoid soil compaction, protect soil structure and soil organism habitat, reduce erosion, and invasive plant species, and maintain productive, resilient rangelands. Grazing and fire are natural parts of many rangeland ecosystems, and when applied at the right intensity and timing, they support long-term soil and plant health.
- 2) **Optimize soil cover** by managing the amount and distribution of vegetation, litter, and residue to protect the soil surface from erosion, reduce water loss from evaporation, improve water infiltration, and support healthy soil function while avoiding excessive thatch accumulation that can limit water movement into the soil.
- 3) **Maximize biodiversity** by promoting a variety of plant species and soil organism communities that improve soil structure and aggregation, increase organic matter inputs, enhance nutrient cycling and water infiltration, and strengthen resilience to drought, pests, and other environmental stresses while supporting overall rangeland health and function.
- 4) **Maximize living roots** by selecting and managing vegetation to maintain active root growth for as much of the year as possible, increasing biological activity on and near root surfaces, supporting nutrient cycling, improving soil structure, improving water capture, and promoting healthy, productive plant communities.

Forestland

- 1) **Optimize disturbance** by managing natural and planned disturbances, such as prescribed fire, thinning, and invasive species control to support soil structure, nutrient cycling, water infiltration, and biological activity, while maintaining ecosystem function and promoting resilient, productive forests.
- 2) **Optimize soil cover** by maintaining an appropriate amount of vegetation, litter, and residue to protect the soil surface from erosion, conserve soil moisture, support water infiltration and biological activity, and reduce the risk of severe wildfire.
- 3) **Optimize biodiversity** by promoting a variety of plants, soil organisms, insects, and other wildlife that support nutrient cycling, soil organic matter accumulation, pore development, and biological activity. Careful, planned inclusion of livestock may enhance these soil health benefits, while unrestricted or prolonged access can be detrimental to forest health.
- 4) **Optimize continuous living roots** by maintaining healthy trees and understory vegetation with active, well-developed root systems that improve soil structure, aggregate stability, support nutrient and water cycling, stabilize soil on steep slopes, reduce erosion, prevent windthrow, and promote resilient forest systems.

Pastureland

- 1) **Optimize disturbance** by applying management practices such as grazing, brush management, and other conservation tools at the appropriate intensity, frequency, and

timing to support nutrient cycling, water infiltration, plant recovery, and biological activity while maintaining productive, resilient pasture systems.

- 2) **Optimize soil cover** by maintaining an appropriate amount of pasture vegetation and residue to reduce evaporation, moderate soil temperatures, improve water infiltration, reduce erosion, protect the soil surface from hoof traffic, support biological activity, and sustain productive forage growth while avoiding excessive litter accumulation that can limit water movement into the soil.
- 3) **Optimize biodiversity** by promoting a variety of pasture plants and soil organisms that support nutrient, energy, and water cycling, enhance biological activity, and forage production, and increase resilience to drought, pests, and other stressors while supporting productive grazing systems.
- 4) **Maximize continuous living roots** by managing pasture vegetation to maintain active root growth for as much of the year as possible, supporting biological activity on and near root surfaces, improving nutrient and water cycling, enhancing soil structure, and sustaining productive pasture systems.

The DIA includes developing implementation requirements for practices that can be used to enable the transition to a Soil Health Management System. It must meet the state adopted NRCS CPS, PS, IR, and SOW included in the participant's conservation plan or contract. It must also include one or more of the following primary practices and activities that address principles of soil health. Primary practices are below.

Note: *The selected conservation practice must have an applicable standard in the Field Office Technical Guide (FOTG) for the state where the evaluation is performed.*

Code	Primary Practice or Activity
311	Alley Cropping
327	Conservation Cover
328	Conservation Crop Rotation
329	Residue and Tillage Management, No-Till
334	Controlled Traffic Farming
336	Soil Carbon Amendment
340	Cover Crop
345	Residue and Tillage Management, Reduced-Till
379	Forest Farming
381	Silvopasture
420	Wildlife Habitat Planting
449	Irrigation Water Management
472	Access Control
484	Mulching
511	Forest Harvest Management
512	Pasture and Hay Planting
528	Grazing Management
550	Range Planting
554	Drainage Water Management

590	Nutrient Management
595	Pest Management Conservation System
610	Salinity & Sodic Soil Management
612	Tree/Shrub Establishment
666	Forest Stand Improvement

Supporting practices may be designed with primary practices to provide the necessary means to improve soil health.

Code	Supporting Practice
314	Brush Management
315	Herbaceous Weed Treatment
324	Deep Tillage
330	Contour Farming
333	Amending Soil Properties with Gypsum Products
338	Prescribed Burning
342	Critical Area Planting
382	Fence
391	Riparian Forest Buffer
384	Woody Residue Treatment
394	Firebreak
490	Tree/Shrub Site Preparation
516	Pipeline
548	Grazing Land Mechanical Treatment
561	Heavy Use Area Protection
574	Spring Development
575	Animal Trails and Walkways
580	Streambank and Shoreline Protection
614	Watering Facility
642	Water Well
655	Forest Trails and Landings

Ensure that all activities and deliverables from CPA 116 or another conservation plan have been completed as applicable. If another conservation plan is used, the plan needs to be approved by NRCS.

1) Evaluations

- a) Planned cropping system rotations.
- b) Soil Erosion Prediction with Soil Conditioning Index (SCI) and Soil Tillage Intensity Rating (STIR) – using current NRCS-approved technology.
- c) Windows Pesticide Screening Tool (WIN-PST) evaluation.
- d) Cover Crop utilization narrative for operation and each PLU.

- e) Cropland In-Field Soil Health Assessment.
 - f) Pasture Condition Score Sheet.
 - g) Determining Indicators of Pasture Health.
 - h) Rangeland In-Field Soil Health Assessment.
 - i) Interpreting Indicators of Rangeland Health reference sheet for each PLU.
 - j) Forestland In-Field Soil Health Assessment.
 - k) Soil Test Results- soil health, fertility, etc.
- 2) Soil Health Management Strategy
- a) Narrative description of the goals of the plan, to be based on evaluations and to incorporate monitoring.
 - b) Primary practices with a narrative description and implementation requirements as defined by the NRCS and documents in state's FOTG.
 - c) Supporting practices with a narrative description and implementation requirements as defined by the state. Only practices all parties agree on will be included in the plan.

Definitions

A Planning Land Unit (PLU) is a unique geographic area, defined by a polygon, which has common land use and is owned, operated, or managed by the same participant or participants. The PLU is the minimum unit for planning.

Soil health is the continued capacity for soil to function as a vital living ecosystem to support plants, animals, and humans.

A Soil Health Management System (SHMS) is a collection of NRCS conservation practices, which focuses on maintaining or enhancing soil health by adhering to the four soil health principles.

DELIVERABLES

The TSP must deliver comprehensive documentation of completed tasks in the following sections:

- **General Requirements**
- **Technical Requirements**
- And the following sections:

Cover Page

The cover page must include the following:

- 1) DIA name and number.
- 2) Participant information: Name, farm bill program name, contract number (TSP obtains contract number from participant), land identification (e.g., state, county, farm, and tract number).
- 3) TSP name, TSP number, TSP expiration date, mailing address, phone number, email address.
- 4) A statement by the TSP that services meet the DIA requirements, such as:

I certify the work completed and delivered for this DIA:

- *Complies with all applicable federal, state, tribal, and local laws and regulations.*

- *Meets the General and Technical Requirements for this DIA.*
- *Bases all planned practices on NRCS Conservation Practice Standards (CPSs) in the applicable state Field Office Technical Guide.*
- *Meets the conservation goals and objectives established in the participant's program contract.*
- *Incorporates alternatives that are both cost effective and appropriate to address the resource issue(s) and participant's objective(s).*

TSP Signature _____ Date _____

5) Participant's acceptance statement indicating:

I accept the completed DIA deliverables as thorough, complete, and fully aligned with my objectives.

Participant Signature _____ Date _____

6) A designated space for an NRCS reviewer to certify the agency's acceptance of the completed DIA.

NRCS administrative review and acceptance completed by:

Signature _____ Title _____ Date _____

Notes and Correspondence

- 1) Provide notes, in chronological order that:
 - a) Document each interaction with the participant, results of that interaction, and the date of the interaction.
 - b) Document each site visit, its participants, the activity completed in the field, and results of each site visit.
 - c) Provide name of the note-maker, if more than one person provides the assistance.
- 2) Information provided to support the participant's understanding of the planned conservation practices, such as applicable Implementation Requirements from the FOTG or other prepared material.
- 3) Provide all copies of correspondence between the TSP and the participant relating to decision making and completion of this DIA.

Implementation Maps

Maps to include, but not be limited to:

- 1) A DIA map (this may consist of several maps to account for the entire planning area). Map(s) will specifically include:
 - a) Boundary lines for the Planning Land Units (PLUs) with labels (name, number, or both).
 - b) Land-use designation and any applicable land-use modifiers such as irrigation for each PLU, as appropriate. The NRCS-recognized land use names and land use modifiers are listed in the National Planning Procedures Handbook, Definitions section (Handbook 180, Part 600.2). (<https://directives.sc.egov.usda.gov/>)
 - c) Acreage for each PLU.

- d) Location of sensitive resources and setbacks, if applicable.
 - e) Locations of planned and applied conservation practices.
 - f) If the planning area includes nonprivate lands, such as federal or tribal lands, a land status map must be included to display land ownership categories (private, state trust, Bureau of Land Management, tribal, and territorial, etc.).
- 2) Soil interpretative map(s) and other natural resource maps to support the planning activity and practice implementation. These could include but are not limited to drainage classes, hydrologic groups, ecological sites, and site-specific soil health properties.
 - 3) All maps developed for the DIA will meet NPHH requirements, including:
 - a) Map title.
 - b) Participant's name.
 - c) Assisted By [TSP planner's name].
 - d) Name of applicable conservation district, county, and state.
 - e) Date prepared.
 - f) Map scale.
 - g) Information needed to locate the planning area, such as geographic coordinates, public land survey coordinates, etc.
 - h) North arrow.
 - i) Appropriate map symbols and a map symbol legend on the map or as an attachment.

Design or Implementation Details

- 1) Develop site-specific written instructions for implementing each planned conservation practice or activity included in the participant's DIA. Those instructions must:
 - a) Include, at a minimum, all items listed in the applicable state's CPS "Plans and Specifications" section and the applicable Practice Specification (PS).
 - b) Include all items listed in the "Operations and Maintenance" section.
 - c) These items may be included in a single document or in multiple documents, as long as all practice specific information and documents are provided.
- 2) Statement of Work documents in a state's FOTG Section 4, include a design section that lists deliverables needed for the participant's successful implementation.
- 3) State Implementation Requirement (IR) documents in FOTG Section 4 are required for preparing and delivering site-specific conservation practice instructions.

Supporting Documentation

Provide results of design tools, resource assessments, or other analyses that are required to meet the criteria in the state's CPS, PS, IR, and SOW. The TSP can use existing records if available.

Deliver Completed Work

The TSP must:

- 1) Prepare and deliver two complete sets of all listed deliverables directly to the participant.
 - a) Participant Copy: Provide one complete set of all required deliverables directly to the participant for their permanent records.
 - b) NRCS Field Office Copy: Provide a second complete set directly to the participant. The participant is responsible for delivering this copy to the local NRCS Field Office.
 - The TSP may submit deliverables directly to the local NRCS Field Office only if explicitly authorized by the participant using the [CPA-1270 form](#).
 - c) Ensure the local NRCS Field Office receives all DIA deliverables early enough to thoroughly review the documentation before final acceptance is requested.

References

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- USDA NRCS. (n.d.). Technical Service Providers. Washington, D.C.
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- USDA NRCS. (n.d.). Water Erosion (RUSLE2). Washington, D.C.
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- USDA NRCS Soil Health Division. 2024. Range and Pasture Technical Note No. 4 (Title 190), Determining Indicators of Pasture Health. Washington, D.C.
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- USDA NRCS Soil Health Division. 2024. Soil Health Technical Note No. 6. (Title 470), Soil Health in Temperate Silvopasture Systems. Washington, D.C.
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- USDA NRCS Soil Health Division. 2025. Soil Health Technical Note No. 8 (Title 470), Forestland In-Field Soil Health Assessment (FIFSHA) Guide, Version 1.3. Washington, D.C. <https://directives.sc.egov.usda.gov/>
- USDA NRCS Soil Health Division. 2025. Soil Health Technical Note No. 10. (Title 470) Cropland

In-Field Soil Health Assessment Guide. Washington, D.C.

<https://directives.sc.egov.usda.gov/>

USDA NRCS Soil Health Division. 2025. Soil Health Technical Note No. 12. (Title 470)

Determining and Managing for Soil Health in Pasture. Washington, D.C.

<https://directives.sc.egov.usda.gov/>

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Pastureland Soil Health: Soil Organism Habitat Loss or Degradation, Version 2.

Washington, D.C. <https://directives.sc.egov.usda.gov/>

USDA NRCS Soil Health Division. 2025. Soil Health Technical Note No. 18. (Title 470) The Basics of Addressing Resource Concerns with Conservation Practices within Integrated Soil Health Management Systems on Cropland, Version 2. Washington D.C.

<https://directives.sc.egov.usda.gov/>

USDA NRCS Soil Health Division. 2026. Soil Health Technical Note No. 19. (Title 470) Soil

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