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Resource Concern Assessment

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Revision History Notes

Date	Summary Description
8/16/2019	Revised version based on feedback collected as result of National Bulletin 440-9-19
9/6/2019	Revisions to Subsidence, Soil Organic Matter Depletion, Soil Organism Habitat Loss or Depletion, Aggregate Instability, and Seeps were made in order to incorporate use of webservices to assist in identification of the resource concerns
9/16/2019	Revised Primary Species List in the Preliminary Inventory section
9/27/2019	Revised Primary Species List. Revised the nutrient management existing condition question that appears under the following components: Nutrients Transported to Surface Water (field loss), Nutrients Transported to Groundwater (field loss), Particulate Matter-Nitrogen Fertilizer, GHG-Nitrogen Fertilizer, Objectionable Odors-Nitrogen Fertilizer, Emissions of Airborne Reactive Nitrogen-Reactive Nitrogen
10/9/2019	Clarified answers and reference text on the Integrated Pest Management question
10/29/3019	Updated text throughout document, including: • Updated reference text for the Pasture Condition Scoresheet questions to match 2019 update • Alignment with latest draft of NRCS Planning Criteria • Clarified future geospatial web services Edits to specific Resource Concerns include: • Compaction: Changed to variable threshold, all applicable land uses now included in one existing condition question • Organic Matter Depletion: All applicable land uses use variable threshold and have one existing condition question • Nutrients Transported to Surface Water and Groundwater (field loss): Clarified how points are allocated for pasture land uses • Sediment Transported to surface Water: Clarified points/analysis • Plant Structure and Composition: Updated reference text for Range existing condition question and clarified land uses
11/22/2019	Updated Soil Runoff tables (#s 67-69, 88-90, 114-116) and Soil Leaching table (#76)
12/18/2019	Corrected reference text in PCS-Live or Dormant Plant Cover question, clarified the three water factors (quantity, quality, and distribution) in Inadequate Livestock Water Existing condition question, and edited Sediment from erosion sources component section for non-cropland land uses to use same analysis as Sheet and rill erosion on non-cropland.
1/3/2020	Changed references to the Rangeland Health Assessment (RHA) to Interpreting Indicators of Rangeland Health (IIRH): tables 17, 24, 34, 38, 45, 46, 65, 119, 156, and 164. Updated Forest Existing Condition tables for Plant productivity and health (tables 157-160), Plant structure and composition (table 165), and Wildfire hazard from

	biomass accumulation (table 169-170). Adjusted Not Applicable and Not Assessed values on wildlife tables 171,172, and 177 for consistency.
1/10/2020	Fixed formatting issues for clarity
1/27/2020	Clarified land use and water feature modifier language in the Aquatic Habitat section, updated Table 171 to align with CART survey answer choices, and corrected points in Table 175 for Terrestrial Range Habitat question #3

Overview

A conservation plan is a record of the client's decisions and supporting information for treatment of a unit of land for one or more identified natural resource concerns as a result of the planning process. The plan describes the schedule of implementation for practices and activities needed to solve identified natural resource concerns and takes advantage of opportunities. The needs of the client, the resources, and Federal, State, Tribal, and local requirements will be met. Planning criteria are established for all resource concerns to provide the minimum level of treatment needed to address any particular concern.

The Conservation Assessment Ranking Tool (CART) is designed to assist conservation planners as they assess site vulnerability, existing conditions, and identify potential resource concerns on a unit of land. Although CART does not directly rely on planning criteria for resource assessment, it utilizes similar inputs to provide thresholds to document whether planning criteria have been achieved, or if additional conservation practices are necessary to meet them. CART results are then used to support conservation planning for the client. CART also captures this information to prioritize programs and report outcomes of NRCS investments in conservation. CART, in its first iteration, will not complete component plans or practice designs.

CART provides a streamlined framework to assess any of the 47 resource concerns identified by NRCS. Assessment of resource concerns is determined by the planner's interaction with a client and considers the client's conservation objectives. Accordingly, a planner may to choose to assess and document a subset of the 47 resource concerns consistent with the progressive planning process. CART assessment questions are not meant to document every question, criteria, and consideration that may be evaluated on a land unit. Rather, they are designed to document resource concerns and the need for conservation practices to meet the assessment threshold. No assessment can completely capture all the potential variability a conservation planner may encounter across the nation and CART is designed to document cases when a planner identifies a basis to override the CART Assessment. This override should be used when a planner can identify through observation or other assessment method that planning criteria has or has not been met, but may be outside or improperly recognized using the streamlined CART questions, information, and analysis framework designed to capture typical conditions. All information is captured on a land unit basis which allows CART to maintain this information for future planning efforts on the same operation. The aggregate data set can be used to improve future iterations of the tool.

CART Methodologies

CART provides a configurable system to evaluate geospatial information along with planner entered data through targeted questions. To efficiently design a system to both capture the data and utilize it for multiple purposes, a point system framework was developed. Every field is evaluated for key intrinsic site characteristics, when applicable, which affect each resource concern. A threshold score is set which is intended to represent the effort needed to attain a target-level of resource conservation using conservation management and conservation practices. Sites are then evaluated for existing management and conservation efforts and compared to the threshold to determine what level of conservation effort is needed.

To combine the many tools and methods in the assessment into a streamlined evaluation, the numerous existing methods needed to be modified to fit the point system to allow for streamlined and efficient capture of the planner's observations and site data. This was not intended to change the expected outcome of planning on a given land unit, but does quantify many of the observations and documents them in a single compatible system which can be used for planning, ranking, outcomes reporting, and environmental assessment.

In general, resource concerns fall into one of three categories for the assessment method used to assess and document a resource concern:

- Client Input/Planner Observation
- Procedural/Deductive
- Predictive

Client Input/Planner Observation: Many of the resource concerns fall into this category. Within the CART system, to the extent possible, a streamlined choice list or list of options will be presented to the planner to document the client input and/or planner observation. These observations will then be compared against the threshold. The majority of Client Input or Planner Observation resource concerns will have a CART system threshold of 50. If the existing condition choice is below 50, then the assessment threshold is not met. Likewise, if the existing condition choice is at or above 50, then the assessment threshold is met. In some cases, geospatial interpretations will be available to help set a threshold. In these situations, the variable threshold attempts to communicate a higher risk or priority for this site, which is likely to require additional conservation to address to the threshold and also communicate additional priority to ranking and the environmental assessment.

Procedural/Deductive: A large group of the remaining resource concerns fall into this category and either reference a tool which consists of an inventory which leads to a determination or have a list of inventory-like criteria in the assessment write-up. Within the CART system, to the extent possible, a streamlined choice list which either replicates or approximate the data captured in the referenced tools is incorporated. Because of the local variability in state tools, these choices will be broad in nature to allow states to more carefully align them with State conditions. As above, many of these have a set threshold of 50, but may have variable thresholds for the same reasons as above.

Predictive: The remaining group of resource concerns are assessed using some sort of predictive interactive model simulation. The CART systems attempt to replicate the outcomes related to the assessment threshold being met or not compared to the model outputs. Most of these have variable thresholds related to the intrinsic site conditions which reflect significant impacts on the model outputs.

Conservation Practices and Activities: After identifying resource concerns and answers to existing condition questions, existing and planned conservation practices and activities can be added to the existing condition to determine the state of the management system. Supporting practices may be necessary to support the conservation practices and activities, and will be identified as necessary supporting practices, but do not add conservation management points to the total. A comprehensive list

of Conservation Practices and Activities and their points towards addressing each resource concern by land use is available as an attachment to this document.

Table 1*: NRCS Resource Concerns*

SWAPA +E Categories	NRCS Resource Concerns
Soil	1. Sheet and rill erosion
	2. Wind erosion
	3. Ephemeral gully erosion
	4. Classic gully erosion
	5. Bank erosion from streams, shorelines, or water conveyance channels
	6. Subsidence
	7. Compaction
	8. Organic matter depletion
	9. Concentration of salts or other chemicals
	10. Soil organism habitat loss or degradation
	11. Aggregate instability
Water	12. Ponding and flooding
	13. Seasonal high water table
	14. Seeps
	15. Drifted snow
	16. Surface water depletion
	17. Groundwater depletion
	18. Naturally available moisture use
	19. Inefficient irrigation water use
	20. Nutrients transported to surface water
	21. Nutrients transported to groundwater
	22. Pesticides transported to surface water
	23. Pesticides transported to groundwater
	24. Pathogens and chemicals from manure, biosolids, or compost applications transported to surface water
	25. Pathogens and chemicals from manure, biosolids, or compost applications transported to groundwater
	26. Salts transported to surface water
	27. Salts transported to groundwater
	28. Petroleum, heavy metals, and other pollutants transported to surface water
	29. Petroleum, heavy metals, and other pollutants transported to groundwater
	30. Sediment transported to surface water

	31. Elevated water temperature
Air	32. Emissions of particulate matter (PM) and PM precursors
	33. Emissions of greenhouse gasses (GHGs)
	34. Emissions of ozone precursors
	35. Objectionable odors
	36. Emissions of airborne reactive nitrogen
Plants	37. Plant productivity and health
	38. Plant structure and composition
	39. Plant pest pressure
	40. Wildfire hazard from biomass accumulation
Animals	41. Terrestrial habitat for wildlife and invertebrates
	42. Aquatic habitat for fish and other organisms
	43. Feed and forage imbalance
	44. Inadequate livestock shelter
	45. Inadequate livestock water quantity, quality and distribution
Energy	46. Energy efficiency of equipment and facilities
	47. Energy efficiency of farming/ranching practices and field operations

Preliminary Inventory information

Several preliminary inventory questions in CART will be asked which will inform other resource assessment questions specific to resource concerns. For example, if "yes" is identified for "Does a surface water feature exist within the PLU?" then planners will be asked the next question, "What type of surface water feature is in the PLU?". However, if "no" is identified for the first question then the second question will not be asked. Land use specific questions will only be asked for the applicable land uses and modifiers. For example, planners will only be asked to identify the crop group, if the PLU they are completing the assessment for is categorized as cropland. Note that CART does not evaluate Undetermined land uses.

Table 2*: Does a surface water feature exist within the PLU?*

** Note: This question will be answered by the water feature PLU modifier.*

Answer
Yes
No

Table 3*: Type of surface water feature in the PLU*

Note: Multiple water features can be selected. This question is required if water feature is selected as a land use modifier.

Answer
Lake or Pond
River
Seep
Spring
Stream
Water Conveyance Channel
Wetland

Table 4*: Furrow Irrigation*

Note: This appears as a check box available for selection if Irrigated is selected as land use modifier.

Answer
Yes
No

Table 5*: Irrigation Amount (inches per acre per year)*

Note: An amount must be entered in a numeric entry box if Irrigated is selected as a land use modifier.

Answer
<12
12 – 23.9
24 – 35.9
≥36

Table 6*: Livestock present on the PLU?*

Answer
Yes
No

Table 7*: Primary Species*

Answer
Cattle Beef Cow/Calf
Cattle Beef Stocker
Dairy cows/heifers
Dry cows
Goats
Horses
Poultry
Sheep
Swine
Aqua culture
Bees
Bison
Deer
Elk
Llamas
Mules
Rabbits
Turkeys
Alpacas

Emu
Fish
Ratites
Other Livestock

Table 8*: Animal Numbers*

Answer
1-10
11-100
101-300
301-1,000
1,001-5,000
5,001-10,000
10,001-100,000
>100,000

Table 9: *Crop Group*

Answer
Unknown
Orchards, vineyards, berries and nut crops
Vegetable Crops
Cotton
Seed crops
Flooded rice and cranberry crops
Turfgrass for sod and nursery crops

Close grown crops - residue not harvested
Close grown crops – residue removed
Row crops – durable residue not harvested
Row crops - residue removed or fragile
Christmas trees
Hay crops - forage

Table 10: *Range Group*

Answer
Natural Grasslands
Savannas
Most Deserts
Tundra
Alpine Plant Communities
Coastal and Freshwater Marshes
Wet Meadows

Table 11: *Pasture Group*

Answer
Warm Season Grasses
Cool Season Grasses

Table 12: *Forest Group*

Answer
100 White/Red/Jack Pine group
120 Spruce/Fir group
140 Longleaf/Slash Pine group
150 Tropical softwoods group
160 Loblolly/Shortleaf Pine group
170 Other eastern softwoods group
180 Pinyon/Juniper group
200 Douglas-fir group
220 Ponderosa Pine group
240 Western White Pine group
260 Fir/Spruce/Mountain Hemlock group
280 Lodgepole Pine group
300 Hemlock/Sitka Spruce group
320 Western Larch group
340 Redwood group
360 Other Western Softwood group
370 California Mixed Conifer group
380 Exotic Softwoods group
390 Other softwood group
400 Oak/Pine group
500 Oak/Hickory group
600 Oak/Gum/Cypress group
700 Elm/Ash/Cottonwood group

800 Maple/Beech/Birch group
900 Aspen/Birch group
910 Alder/Maple group
920 Western Oak group
940 Tanoak/Laurel group
950 Other Western Hardwoods group
960 Other Hardwood group
970 Woodland Hardwoods group
980 Tropical Hardwoods group
988 Cloud Forest
990 Exotic Hardwoods group
999 Nonstocked

Soil

Sheet and Rill Erosion

Component: Sheet and rill erosion

Description: Detachment and transport of soil particles caused by rainfall, melting snow, or irrigation.

Objective: Reduce sheet and rill erosion to T.

Analysis within CART:

Crop

Each planned land unit (PLU) designated as cropland will have a calculated PLU Erodibility Index - water (EI_{wt}) based on the dominant critical soil (see equation 1 below) in the PLU. The (EI_{wt}) will be categorized into four soil erodibility potentials through the Conservation Resource Web Services – PLU Modified Erodibility Potential-Water. The service utilizes the NRCS published soils database (SSURGO) according to equations 1 and 2.

Equation 1: $EI_{wt} = K*(LS)/T$

Where K is the soil erodibility factor of the surface horizon of the dominant critical soil component. The dominant critical soil component is determined as the soil with the highest

surface K factor and is a major map unit component (majorcompflag=True) that is greater than 10% of the PLU. In case of a K factor tie, choose the soil component among the set having the highest percent of the PLU. K is obtained from the SSURGO data base data element for soil erodibility factor (chorizon.kffact).

LS is derived from a simplification of the original LS calculation of Wischmeier and Smith (1978). This simplification by Stone and Hilborn (2012) removes the need for trigonometric functions in the LS calculation.

Equation 2: $LS = [0.065 + 0.0456 (slope) + 0.006541 (slope)^2] (slope\ length \div constant)^{NN}$

Where:
slope = slope steepness in percent from the representative slope in SSURGO (component.slope_r).

slope length = length of slope in m (ft) calculated using "default slope parameters" created by Lightle and Weesies (1998, data not shown) using the representative slope in SSURGO (component.slope_r).

constant = 22.1 metric (72.5 Imperial)

NN is derived from the slope. For slopes <1, NN = 0.2; for slopes equal to 1 and less than 3, NN = 0.3; for slopes equal to three and less than 5, NN = 0.4; for slopes equal to and greater than 5, NN = 0.5

Table 13: *PLU Modified Erodibility Potential – Water (EIw) Categories.*

PLU Modified Erodibility Potential – Water (EI_{wt})
High (≥0.20)
Moderately High (≥0.10 – <0.20)
Moderate (≥0.05 – <0.10)
Low (<0.05)

Using the R factor from digitized map of R factor classes (via a web service) and the EI_{wt} the threshold of conservation management points necessary can be determined in Table 14 and modified by irrigation amount and type in Table 15.

Table 14: *Determining Sheet and Rill Erosion Threshold*

PLU Modified Erodibility Potential – Water (EI_{wt})	R Factor			
	≤50	>50-150	>150-250	>250
High	30	40	60	80
Moderately High	20	30	50	60
Moderate	10	20	40	50
Low	10	10	20	40

Irrigation Adjustment:

Table 15: *Irrigation R Factor Adjustment*

Irrigation R Factor Adjustment				
R Factor Modification	R Factor Class Inches Per Acre Per Year			
	≤50	>50 – 150	>150 – 250	>250
Move 1 Class Higher	12 to 23.9	12 to 23.9	≥12	N/A
Move 2 Classes Higher	24 to 35.9	≥24	N/A	N/A
Move 3 Classes Higher	≥36	N/A	N/A	N/A
* Cannot move class higher than “>250”				

If yes is selected for furrow irrigation, R factor modification is >250.

The existing condition Crop Rotation Cover/Residue/Biomass Credit question will set the existing score as seen in Table 16. Note: This question, like others, is only asked once in CART but points will be assigned to multiple resource concerns as appropriate.

Table 16: *Crop Rotation Cover/Residue/Biomass Credit*

Existing Condition - Crop Rotation Credit Existing condition credits are based on system benefits for cover/residue/biomass of all crops and cover crops in the rotation combined with the effects of harvesting, grazing and tillage. Individual credits for associated practices like crop rotation, cover crop and residue management are added to this system level credit.	Sheet and Rill Erosion Points

None – Rapidly Depleting Soil Organic Matter • Soil Conditioning Index is well below zero • Generally fallow, or crops with no durable residue or cover crops, with up to full field tillage.	0
Low – Depleting Soil Organic Matter • Soil Conditioning Index is just below zero • Generally, crops with durable residue or cover crops, or part of the rotation in high residue conserving use crops, with up to full field tillage.	5
Moderate – Maintaining Soil Organic Matter • Soil Conditioning Index is zero or above • Generally, crops with durable residue or cover crops, or part of the rotation in high residue conserving use crops, with reduced tillage or no-till.	15
High – Building Soil Organic Matter • Soil Conditioning Index is well above zero • Generally high residue conserving use crops or perennial crops with full ground cover, not tilled or tilled infrequently.	40

Range

For Range land uses, a standard threshold of 50 is set. This component will be addressed by answering the Interpreting Indicators of Rangeland Health (IIRH) question in Table 17.

Table 17: *Rangeland Health - Soil/Site Stability Limitations*

Answer	Existing Condition Points	Reference for Existing Condition
Not assessed	-1	
None to Slight	60	Interpreting Indicators of Rangeland Health, version 5
Slight to Moderate	51	Interpreting Indicators of Rangeland Health, version 5
Moderate	30	Interpreting Indicators of Rangeland Health, version 5
Moderate to Extreme	15	Interpreting Indicators of Rangeland Health, version 5
Extreme to Total	1	Interpreting Indicators of Rangeland Health, version 5

Pasture

For Pasture land uses, a standard threshold of 50 is set. This component will be addressed by answering the Pasture Condition Score Sheet (PCS) existing condition questions in Table 18, Table 19, and Table 20.

Table 18: *Pasture Condition Score Sheet - Plant Vigor*

Answer	Existing Condition Points	Reference for Existing Condition
Not assessed	-1	
High	20	• Rapid recovery of desirable forage. All healthy green forage. • Pasture Condition Score element score = 5
Good	17	• Good recovery of desirable forage. Light green and dark green forage present. • Pasture Condition Score element score = 4
Fair	10	• Adequate recovery of desirable forage. Yellowish and dark green areas due to manure and urine patches. • Pasture Condition Score element score = 3
Low	5	• Some recovery. Yellowish green forage, or moderately or sight stunting of desirable forage. • Pasture Condition Score element score = 2
Poor	1	• No plant recovery after grazing/harvest. Pale, yellow or brown, or severe stunting of desirable forage. • Pasture Condition Score element score = 1

Table 19: *Pasture Condition Score Sheet– Live or Dormant Plant Cover*

Answer	Existing Condition Points	Reference for Existing Condition
Not assessed	-1	
High	20	• More than 95% live (non-dormant) leaf canopy. Remaining is either dead standing material, or bare ground. • Pasture Condition Score element score = 5
Good	17	• 81-95% live leaf canopy. Remaining is either dead standing material, or bare ground.

		• Pasture Condition Score element score = 4
Fair	10	• 66-80% live leaf canopy. Remaining is either dead standing material, or bare ground. • Pasture Condition Score element score = 3
Low	5	• 40-65% is live leaf canopy Remaining is either dead standing material, or bare ground. • Pasture Condition Score element score = 2
Poor	1	• Less than 40% is live leaf canopy. Remaining is either dead standing material, or bare ground. • Pasture Condition Score element score = 1

Table 20: *Pasture Condition Score Sheet – Erosion*

Answer	Existing Condition Points	Reference for Existing Condition
Not assessed	-1	
High	20	• Sheet and Rill: Plant density high, no runoff, good infiltration. No evidence of present or past erosion. • Pasture Condition Score element score = 5
Good	17	• Sheet and Rill: Plant density high, runoff low, good infiltration. May have evidence of past erosion if present. • Pasture Condition Score element score = 4
Fair	10	• Sheet and Rill: Plant density good and runoff moderate. If present, erosion concentrated on heavily used areas. • Pasture Condition Score element score = 3
Low	5	• Sheet and Rill: Plant density slows runoff. Erosion present and easily seen on steeper terrain. • Pasture Condition Score element score = 2
Poor	1	• Sheet and Rill: Plant density is insufficient to stop runoff and poor infiltration. Erosion easily visible throughout pasture. • Pasture Condition Score element score = 1

Forest, Farmstead, Associated Agriculture Land, Other Rural Land

If the Resource concern component is applicable the planner will identify this resource concern based on site-specific conditions. A threshold value of 50 will be set and the existing condition question will be triggered. The existing condition question will set the existing score as seen in Table 21.

Table 21: *Sheet and Rill Erosion Existing Condition*

Answer	Existing Condition Points
Not assessed	-1
Not applicable	0
Site is stable and without visible signs of active erosion.	51
Site is NOT stable and has visible signs of active erosion.	1

Wind Erosion

Component: Wind erosion

Description: Detachment and transport of soil particles caused by wind.

Objective: Reduce wind erosion to T.

Analysis within CART:

Crop

Each PLU for crop will have the PLU soil wind erosion potential determined based on the dominant critical soil component as described below. The (EP_{wd}) will be categorized into four soil erodibility potentials through the Conservation Resource Web Services – PLU Modified Erodibility Potential-Wind (EP_{wd}). The service utilizes the NRCS-published soils database (SSURGO).

The Stewardship Tool for Environmental Performance (STEP) PLU Erodibility Potential – Wind for a PLU is calculated as

$$EP_{wd} = C*I/T$$

Where:

C Factor (Wind erosion climatic factor). Using geolocation, the C Factor is obtained established from a digitized C Factor map. In the future, a better estimation of a wind energy utilizing the climate data used in WEPS may be investigated.

I Factor (soil erodibility factor – wind) of the surface horizon of the dominant critical soil component. Dominant critical is determined as the soil with the highest surface sand percentage, is a major map unit component (majorcompflag=True) that is greater than 10% of the PLU. The I factor is obtained from the SSURGO data base data element for wind erodibility index (component.wei).

T is the soil loss tolerance factor for the component. The T factor is determined for the dominant critical soil component. T is obtained from the SSURGO data base data element for the soil loss tolerance factor (component.tfact).

Table 22*: Determining Wind Erosion Vulnerability*

Wind Erosion Vulnerability (Based on C*I/T)	Threshold
High (≥16)	80
Moderately High (≥8 to <16)	50
Moderate (≥4 to <8)	20
Low (<4)	10

Irrigation Adjustment:

If the PLU is irrigated, the I value used for the calculation will be lowered by one I factor for factors that are 180 or less.

The existing condition question will set the existing score as seen in Table 23.

Table 23*: Crop Rotation Cover/Residue/Biomass Credit*

Existing Condition - Crop Rotation Credit Existing condition credits are based on system benefits for cover/residue/biomass of all crops and cover crops in the rotation combined with the effects of harvesting, grazing and tillage. Individual credits for associated practices like crop rotation, cover crop and residue management are added to this system level credit.	Wind Erosion Points
None – Rapidly Depleting Soil Organic Matter • Soil Conditioning Index is well below zero • Generally fallow, or crops with no durable residue or cover crops, with up to full field tillage.	0
Low – Depleting Soil Organic Matter	5

• Soil Conditioning Index is just below zero • Generally, crops with durable residue or cover crops, or part of the rotation in high residue conserving use crops, with up to full field tillage.	
Moderate – Maintaining Soil Organic Matter • Soil Conditioning Index is zero or above • Generally, crops with durable residue or cover crops, or part of the rotation in high residue conserving use crops, with reduced tillage or no-till.	15
High – Building Soil Organic Matter • Soil Conditioning Index is well above zero • Generally high residue conserving use crops or perennial crops with full ground cover, not tilled or tilled infrequently.	40

Range

For Range land uses, a standard threshold of 50 is set. This component will be addressed by answering the question in Table 24.

Table 24: *Rangeland Health - Soil/Site Stability Limitations*

Answer	Existing Condition Points	Reference for Existing Condition
Not assessed	-1	
None to Slight	60	Interpreting Indicators of Rangeland Health, version 5
Slight to Moderate	51	Interpreting Indicators of Rangeland Health, version 5
Moderate	30	Interpreting Indicators of Rangeland Health, version 5
Moderate to Extreme	15	Interpreting Indicators of Rangeland Health, version 5
Extreme to Total	1	Interpreting Indicators of Rangeland Health, version 5

Pasture:

For Pasture land uses, a standard threshold of 50 is set. This component will be addressed by answering the PCS existing condition questions in Table 25 and Table 26.

Table 25: *Pasture Condition Score Sheet – Live or Dormant Plant Cover*

Answer	Existing Condition Points	Reference for Existing Condition
Not assessed	-1	
High	32	• More than 95% live (non-dormant) leaf canopy. Remaining is either dead standing material, or bare ground. • Pasture Condition Score element score = 5
Good	30	• 81-95% live leaf canopy. Remaining is either dead standing material, or bare ground. • Pasture Condition Score element score = 4
Fair	26	• 66-80% live leaf canopy. Remaining is either dead standing material, or bare ground. • Pasture Condition Score element score = 3
Low	10	• 40-65% is live leaf canopy Remaining is either dead standing material, or bare ground. • Pasture Condition Score element score = 2
Poor	1	• Less than 40% is live leaf canopy. Remaining is either dead standing material, or bare ground. • Pasture Condition Score element score = 1

Table 26: *Pasture Condition Score Sheet – Erosion*

Answer	Existing Condition Points	Reference for Existing Condition
Not assessed	-1	
High	32	• Wind: No exposed soil. • Pasture Condition Score element score = 5
Good	30	• Wind: Minimal soil exposed, some detached vegetation windrolled, minor plant damage. • Pasture Condition Score element score = 4
Fair	26	• Wind: Occasional scoured areas, litter windrolled. • Pasture Condition Score element score = 3
Low	10	• Wind: Scoured areas common, deposition affecting plants.

		• Pasture Condition Score element score = 2
Poor	1	• Wind: Severe scoured areas and deposition throughout. • Pasture Condition Score element score = 1

Forest, Farmstead, Developed Land, Associated Agriculture Land, Other Rural Land

If the resource concern component is applicable the planner will identify this resource concern based on site-specific conditions. A threshold value of 50 will be set and the existing condition question will be triggered. The existing condition question will set the existing score as seen in Table 27.

Table 27*: Wind Erosion Existing Condition*

Answer	Existing Condition Points
Not assessed	-1
Site is stable and without visible signs of active erosion	51
Site is NOT stable and has visible signs of active erosion	1
Not applicable	0

Ephemeral Gully Erosion

Component: Ephemeral gully erosion

Description: Soil erosion that results in small gullies in the same flow area that can be obscured by tillage.

Objective: Control the formation of ephemeral gullies.

Analysis within CART:

Crop

The planner will identify this resource concern based on aerial maps and site-specific conditions. A threshold value of 50 will be set and the existing condition questions will be triggered. The existing condition question will set the existing score as seen in Table 28.

In the future, geospatial layers such as lidar-based maps may be used in to identify potential locations where ephemeral gullies may occur.

Table 28*: Ephemeral Gully Erosion Existing Condition*

Answer	Existing Condition Points
Not assessed	-1
No ephemeral gullies observed	51
Ephemeral gullies are observed	1

Classic Gully Erosion

Component: Classic gully erosion

Description: Gullies created by runoff that can enlarge a channel progressively by head cutting, lateral widening.

Objective: Stabilize an actively eroding gully.

Analysis within CART:

Crop, Forest, Range, Pasture, Farmstead, Developed Land, Associated Agriculture Land, Other Rural Land

The planner will identify this resource concern based on site-specific conditions, a threshold value of 50 will be set, and existing condition questions will be triggered. The existing condition question will set the existing score as seen in Table 29.

In the future, potential for lidar-based maps to identify potential locations where classic gully erosion may occur.

Table 29*: Classic Gully Erosion Existing Condition*

Answer	Existing Condition Points
Not assessed	-1
No active gully erosion observed	51
Active gully erosion is observed	1

Bank Erosion from Streams, Shorelines, or Water Conveyance Channels

Component: Bank erosion from streams, shorelines, or water conveyance channels

Description: Erosion resulting from poor land management practices upstream such as reduced soil infiltration water holding capacity, storm events, wave action, rain, ice, wind, runoff, loss of vegetation, hydrologic dynamics, stream isolation from floodplains, other disturbed or altered geomorphological processes.

Objective: Restore the stability of eroding banks.

Analysis within CART:

Crop, Forest, Range, Pasture, Farmstead, Developed Land, Associated Land, Other Rural Land

If a water feature land use modifier is selected, the planner will be required to identify the type of water feature that exists. In the future, geospatial layers may be used in the future to indicate blue line streams or state specified stream designations and other water features such as ponds.

The planner will then be required to identify the bank condition. The existing bank condition will be classified into four categories as identified in Table 30. The threshold value of 50 is equivalent to a moderately stable bank. This is consistent with the planning criteria that requires that *Element 3 Bank Condition* in the Stream Visual Assessment Protocol 2 (SVAP2) be at least moderately stable. Although SVAP2 is not used to assess erosion on shorelines or water conveyance channels, the same general bank conditions should be used to determine the threshold.

Table 30*: Bank Erosion Existing Condition*

Answer	Conservation Management Points
Not assessed	-1
Not applicable	0
Stable	60
Moderately stable	51
Moderately unstable	25
Unstable	1

Subsidence

Component: Subsidence

Description: Loss of volume and depth of organic soils due to oxidation caused by above normal microbial activity resulting from excessive water drainage, soil disturbance, or extended drought. This excludes karst, sinkholes, and issues or depressions caused by underground activities. This resource concern is only applicable when the soil is a histosol.

Objective: Reduce potential for subsidence to occur and treat existing subsidence.

Analysis within CART:

Crop, Forest, Range, Pasture, Farmstead, Associated Agriculture Land

Oxidation of organic matter, by introduction of conditions favorable to development of aerobic organisms causes subsidence and may negatively affect the intended land use.

If the planner determines assessment of the resource concern will occur, a Soil Data Access (Agricultural Organic Soil Subsidence Interpretation, https://jneme910.github.io/CART/chapters/Agricultural_Organic_Soil_Subsidence) web service will be used to determine the percentage of organic soils in the PLU. The Soil Data Access services utilizes the NRCS published soils database (SSURGO). The service request calculates the rolling sum values for rating acres and rating percent for each resource concern and finds the single most limiting rating (per land unit) that comprises **at least 10% by area or 10 acres**. Soils with a severe, or moderate rating for vulnerability to subsidence are present, a threshold value of 50 will be set (see Table 31) and existing condition question will be triggered. The existing condition question will set the existing score as shown in Table 32.

Table 31*: Determining Subsidence Threshold*

Answer	Subsidence Vulnerability Points	Definition
Soil has severe to moderate vulnerability to subsidence	50	The soil has features that are vulnerable to subsidence.
Soils rated “low subsidence” or “mineral soil”	no threshold set	"Low subsidence" indicates that the soil has one or more features that are unfavorable for aerobic soil organisms. With careful management, the soil can be used for crop production and be nearly sustainable. Soils that are not organic are rated "Mineral soil" that do not subside due to organic matter oxidation.

Table 32*: Subsidence Existing Condition*

Answer	Existing Condition Points
Not assessed	-1
Organic soil-building conditions have been restored	51
Impairs the intended land use	1
Does not occur	51

Compaction

Component: Compaction

Description: Management-induced soil compaction at any level throughout the soil profile resulting in reduced plant productivity, biological activity, infiltration, aeration, or some combination of these.

Objective: Reduce potential for compaction to occur and treat existing compaction.

Analysis within CART:

If the planner determines assessment of the resource concern will occur, a Soil Data Access (Soil Susceptibility to Compaction Interpretation, https://jneme910.github.io/CART/chapters/Soil_Susceptibility_to_Compaction) web service will be used to determine the percentage of soils with inherent susceptibility to compaction. The Soil Data Access services utilizes the NRCS-published soils database (SSURGO). If the potential for compacted soils are present, a threshold value will be set as determined in Table 33 and the existing condition question will be triggered. The existing condition question will set the existing score as seen in Table 34.

Table 33*: Determining Compaction Threshold*

Answer	Threshold	Definition
Low	1	Low – The potential for compaction is insignificant. This soil can support standard equipment with minimal compaction. The soil is moisture insensitive, exhibiting only small changes in density with changing moisture content.
Medium	30	Medium – The potential for compaction is significant. The growth rate of seedlings may be reduced following compaction. After the initial compaction (i.e., the first equipment pass), this soil can support standard equipment with only minimal increases in soil density. The soil is intermediate between moisture insensitive and moisture sensitive.
High	50	High – The potential for compaction is significant. The growth rate of seedlings will be reduced following compaction. After initial compaction, this soil is still able to support standard equipment, but will continue to compact with each subsequent pass. The soil is moisture sensitive, exhibiting large changes in density with changing moisture content.

Crop, Forest, Associated Agriculture Land, Other Rural Land, Pasture, Range

Table 34*: Compaction Existing Condition Points*

Answer	Existing Condition Points	Reference/explanatory information
Compaction is not significant	51	Cropland, Forest, Associated Ag. Land or Other • No observed evidence of compaction, such as ponding, stunted plant growth, or root growth limitation. • Penetrometer rating less than 150 psi within top 6" depth and less than 300 in 6-18" depth; • State-modified In-Field Soil Health Assessment Worksheet based on the national template indicates no compaction resource concern Range • Interpreting Indicators of Rangeland Health, version 5 indicates: • Soil Site Stability: slight to moderate or less AND • Hydrologic Function: slight to moderate or less OR • Compaction Indicator 11 slight to moderate or less. OR • No observed evidence of compaction, such as ponding, stunted plant growth, or root growth limitation. Pasture • Pasture Condition Score Sheet use indicates Soil Compaction and Soil Regenerative Features element 4 or higher • Compaction: Minor dense or platy layer; good aggregates common (crumbly soil): • Roots: Few horizontal, more downward through the soil profile; • Soil Life: Signs numerous throughout.
Compaction is significant	0	Cropland, Forest, Associated Ag. Land or Other

		• Evidence of compaction, such as ponding, stunted plant growth, or root growth limitation is observed. • Penetrometer rating greater than 150 psi within top 6" depth and greater than 300 in 6-18" depth; • State-modified In-Field Soil Health Assessment Worksheet based on the national template indicates a compaction resource concern occurs. Range • Interpreting Indicators of Rangeland Health, version 5 indicates: • Soil Site Stability: greater than moderate AND • Hydrologic Function: greater than moderate OR • Compaction Indicator 11 greater than moderate OR • Evidence of compaction, such as ponding, stunted plant growth, or root growth limitation is observed. Pasture • Pasture Condition Score Sheet use indicates Soil Compaction and Soil Regenerative Features element 3 or lower. • Thin to thick, dense or platy layer present; • Roots: at least some horizontal; • Soil Life: Signs scattered to few throughout.
Not Assessed	-1	

Organic Matter Depletion

Component: Organic matter depletion

Description: Management-induced depletion of any or all pools of soil organic matter resulting in limited soil function and processes that support plant productivity, biological activity, water and nutrient cycling, or some combination of these.

Objective: Maintain, increase, or improve soil organic matter.

Analysis within CART:

Crop, Forest, Associated Agriculture Land, Pasture, Range

If the planner determines assessment of the resource concern will occur, a Soil Data Access (Agricultural Organic Matter Depletion Interpretation, https://jneme910.github.io/CART/chapters/Organic_Matter_Depletion) web service will be used to determine the percentage of soils susceptible to organic matter depletion in the PLU. The Soil Data Access services utilizes the NRCS published soils database (SSURGO). The service request calculates the rolling sum values for rating acres and rating percent for each resource concern and finds the single most limiting rating (per land unit) that comprises **at least 10% by area or 10 acres**.

Table 35*: Organic Matter Threshold*

Soil Interpretation Rating	Threshold
Soil highly capable of accumulating SOM (rating = Low or moderately low vulnerability to depletion)	40
Soil moderately capable of accumulating SOM (rating = Moderate to moderately high vulnerability to depletion)	50
Soil barely capable of accumulating SOM (rating = High vulnerability to depletion)	60
No soil rating available	50

Note: If the PLU is irrigated, then it moves to the next *higher* soil interpretation rating class because irrigation use reduced moisture deficit in the soil thereby enhancing its capability to accumulate SOM.

When selected for evaluation, the existing condition question will be triggered as shown below for each land use.

Crop

Existing condition points are based on the combination of the soil's inherent capability to maintain or accumulate SOM with the cropping management system benefits for cover/residue/biomass of all crops and cover crops in the rotation combined with the effects of harvesting, grazing and tillage. Individual points for associated practices like crop rotation, cover crop and residue management are added to this system level credit.

Table 36*: Organic Matter Existing Condition*

Answer	Existing Condition Points				Reference for Existing Condition
	Soil highly capable of accumulating OM	Soil moderately capable of accumulating	Soil barely capable of accumulating OM	No soil rating available	

	(rating = Low or moderately low vulnerability to depletion)	OM (rating = Moderate to moderately high vulnerability to depletion)	(rating = High vulnerability to depletion)		
Not Assessed	-1	-1	-1	-1	
None – Rapidly Depleting Soil Organic Matter	0	0	0	0	• Soil Conditioning Index is well below zero • Generally fallow, or crops with no durable residue or cover crops, with up to full field tillage.
Low - Depleting Soil Organic Matter	10	10	10	10	• Soil Conditioning Index is just below zero • Generally, crops with durable residue or cover crops, or part of the rotation in high residue conserving use crops, with up to full field tillage.
Moderate - Maintaining Soil Organic Matter	40	50	60	50	• Soil Conditioning Index is zero or above • Generally, crops with durable residue or cover crops, or part of the rotation in high residue conserving use crops, with reduced tillage or no-till.

Forest, Associated Agriculture Land

Table 37*: Organic Matter Existing Condition*

Answer	**Existing Condition Points**				**Reference for Existing Condition**
	Soil highly capable of accumulating OM (rating = Low to moderately low vulnerability to depletion)	Soil moderately capable of accumulating OM (rating = Moderate to moderately high vulnerability to depletion)	Soil barely capable of accumulating OM (rating = High vulnerability to depletion)	No soil rating available	
Not Assessed	-1	-1	-1	-1	

None – Rapidly Depleting Soil Organic Matter	0	0	0	0	Soil is bare, vegetation and litter a sparse
Low - Depleting Soil Organic Matter	10	10	10	10	The ground is partly covered with plant litter in various stages of decomposition, herbaceous vegetation, and/or a biological crust that protects the soil.
Moderate - Maintaining Soil Organic Matter	40	50	60	50	The ground is thoroughly covered with plant litter in various stages of decomposition, herbaceous vegetation, and/or a biological crust that protects the soil.

Range

Table 38*: Organic Matter Existing Condition*

Answer	**Existing Condition Points**				**Reference for Existing Condition**
	Soil highly capable of accumulating OM (rating = Low to moderately low vulnerability to depletion)	Soil moderately capable of accumulating OM (rating = Moderate to moderately high vulnerability to depletion)	Soil barely capable of accumulating OM (rating = High vulnerability to depletion)	No soil rating available	
Not Assessed	-1	-1	-1	-1	
None – Rapidly Depleting Soil Organic Matter	0	0	0	0	Interpreting Indicators of Rangeland Health, version 5 - Soil/Site Stability Limitations AND Biotic Integrity ratings are between Total and Moderate.

Low - Depleting Soil Organic Matter	10	10	10	10	Interpreting Indicators of Rangeland Health, version 5 - Soil/Site Stability Limitations AND Biotic Integrity ratings are between Moderate and Slight.
Moderate - Maintaining Soil Organic Matter	40	50	60	50	Interpreting Indicators of Rangeland Health, version 5 - Soil/Site Stability Limitations AND Biotic Integrity ratings are between Slight and None.

Pasture

Table 39*: Organic Matter Existing Condition*

Answer	**Existing Condition Points**				**Reference for Existing Condition**
	Soil highly capable of accumulating OM (rating = Low to moderately low vulnerability to depletion)	Soil moderately capable of accumulating OM (rating = Moderate to moderately high vulnerability to depletion)	Soil barely capable of accumulating OM (rating = High vulnerability to depletion)	No soil rating available	
Not Assessed	-1	-1	-1	-1	
None – Rapidly Depleting Soil Organic Matter	0	0	0	0	Pasture Condition Score Sheet use indicates 1. **Live or Dormant Plant Cover** element score is 2 or lower (less than 65% is live leaf canopy, and remainder is dead standing material or bare ground) AND 2. **Plant Residue and Litter as Soil Cover**

					element score is 2 or lower (opening of bare soil can be seen fairly easily; soil cover is below 40%) AND 3. **Plant Diversity by Dry Weight** element score is 2 or lower (diversity is low or worse, 2 or fewer desirable species in 1 functional group or two functional groups represented by minor species totaling less than 15%)
Low - Depleting Soil Organic Matter	10	10	10	10	Pasture Condition Score Sheet use indicates 1. **Live or Dormant Plant Cover** element score is 3 (less than 81% is live leaf canopy, and remainder is dead standing material or bare ground) AND 2. **Plant Residue and Litter as Soil Cover** element score is 3 (small openings of bare soil can be seen but are minimal; soil cover is below 60%) AND 3. **Plant Diversity by Dry Weight** element score is 3 (diversity is moderate, 3 dominant desirable species in 1 functional group OR 2-3 dominant desirable species in 2 functional

					groups OR 3 functional groups each represented by minor species totaling ≥15%)
Moderate - Maintaining Soil Organic Matter	40	50	60	50	Pasture Condition Score Sheet use indicates 1. **Live or Dormant Plant Cover** element score is 4 or 5 (more than 81% is live leaf canopy, and remainder is dead standing material or bare ground) AND 2. **Plant Residue and Litter as Soil Cover** element score is 4 or 5 (no bare soil can be easily seen; soil cover is above 61% with good biological activity and decomposition of older residue) AND 3. **Plant Diversity by Dry Weight** element score is 4 or 5 (diversity is high, 4 or more desirable species in 2 or more functional groups or 3 or more dominant desirable species in 2 functional groups and 1 additional functional group represented by minor species totaling more than 15%)

Concentration of Salts or Other Chemicals

Component: Concentration of salts or other chemicals

Description: Concentration of salts leading to salinity and/or sodicity reducing productivity or limiting desired use, or concentrations of other chemicals impacting productivity, populations of beneficial organisms, or limiting desired use.

Objective: Reduce concentration of salts or other chemicals in the soil.

Analysis within CART:

Crop, Forest, Range, Pasture, Associated Agriculture Land, Farmstead, Developed Land

If the planner determines assessment of the resource concern will occur, a Soil Data Access (Agricultural Surface Salt Concentration Interpretation, (https://jneme910.github.io/CART/chapters/Surface_Salt_Concentration) web service will be used to determine the percentage of soils susceptible to excess salinity or sodicity in the PLU. The Soil Data Access services utilizes the NRCS published soils database (SSURGO). The service request calculates the rolling sum values for rating acres and rating percent for each resource concern and finds the single most limiting rating (per land unit) that comprises at least 10% by area or 10 acres.
If saline or sodic soils are present, a threshold value will be set according to Table 40 and the existing condition question will be triggered.

Table 40*: Determining Threshold for Concentration of Salts and Other Chemicals*

Answer	Concentration of Salts and Other Chemicals Vulnerability Points	Definition
High surface salinization risk or already saline	50	"High surface salinization risk or already saline" indicates that the soil has features that are very favorable for the accumulation of salts at the surface or are already saline. These soils are already limited by excess surface salts.
Surface salinization risk	30	"Surface salinization risk" indicates that the soil has features that are somewhat favorable for surface salinization. Careful management will be needed to avoid damage from salinity.
Low surface salinization risk	1	"Low surface salinization risk" indicates that the soil has one or more features that are unfavorable for salinization. These soils exist in climates where salinization does not occur or on landscape positions where salts are unlikely to accumulate.

SSURGO did not indicate have potential Concentration of Salts and Other Chemicals	0	Soil with low vulnerability can still suffer salinity or sodicity. On-site observation and use of the planner override should be used.

Table 41*: Surface Salinization Risk*

Answer	Existing Condition Points
Not assessed	-1
Soil or irrigation water test report indicates salinity/sodicity is within suitable range for desired plants. (Crop specific electrical conductivity (EC), pH, or sodium adsorption ratio (SAR) threshold values are not exceeded.) OR No plant tissue salt injury symptoms are apparent OR For range and pasture, salt concentrations are match what is expected for the ecological site description	51
Observation of mineral crust on the soil surface, OR Soil or irrigation water test report indicates a salinity/sodicity impairment for desired plants. (Crop specific electrical conductivity (EC), pH, or sodium adsorption ratio (SAR) threshold values are exceeded.) OR Observation of plant tissue salt injury symptoms including necrosis (burning) of leaf margins,	1

stunted plants, wilting and in severe cases, plant death OR For range and pasture, salt concentrations are outside what is expected for the ecological site description.	
No evidence of existing salinity/sodicity problem	51

Soil Organism Habitat Loss or Degradation

Component: Soil organism habitat loss or degradation

Description: Quantity, quality, diversity or connectivity of food, cover, space, shelter and/or water is inadequate to meet requirements of beneficial organisms

Objective: Improve habitat for beneficial soil organisms.

Analysis within CART:

If the planner determines assessment of the resource concern will occur, a Soil Data Access (Agricultural Organic Matter Depletion Interpretation, https://jneme910.github.io/CART/chapters/Suitability_for_Aerobic_Soil_Organisms) web service will be used to determine the percentage of soils suitable for aerobic soil organisms in the PLU. The Soil Data Access services utilizes the NRCS published soils database (SSURGO). The service request calculates the rolling sum values for rating acres and rating percent for each resource concern and finds the single most limiting rating (per land unit) that comprises at least 10% by area or 10 acres.

Crop
When selected for evaluation, a threshold value will be set based on the Soil Data Access web service and the existing condition question (matching what is used in soil erosion evaluations) will be triggered.

Table 42*: Soil Organism Habitat Loss or Degradation Threshold, based on Suitability for Aerobic Soil Organisms*

Soil Interpretation Rating	Threshold
Very favorable	40
Somewhat favorable	50
Not favorable	60
No soil rating available	50

Note: If the PLU is irrigated, then it moves to the next *higher* soil interpretation rating class because irrigation use reduced moisture deficit in the soil thereby enhancing its capability to accumulate SOM.

Existing condition points are based on the combination of the soil's inherent suitability for aerobic soil organism habitat with the cropping management system benefits for cover/residue/biomass of all crops and cover crops in the rotation combined with the effects of harvesting, grazing and tillage. Individual points for associated practices like crop rotation, cover crop and residue management are added to this system level credit.

Table 43*: Soil Organism Habitat Loss or Degradation Existing Condition Points*

Answer	**Existing Condition Points**				**Reference for Existing Condition**
	Very favorable	Somewhat favorable	Not favorable	No soil rating available	
Not Assessed	-1	-1	-1	-1	
None – Rapidly Depleting Soil Organic Matter	0	0	0	0	• Soil Conditioning Index is well below zero • Generally fallow, or crops with no durable residue or cover crops, with up to full field tillage.
Low - Depleting Soil Organic Matter	10	10	10	10	• Soil Conditioning Index is just below zero • Generally, crops with durable residue or cover crops, or part of the rotation in high residue conserving use crops, with up to full field tillage.
Moderate - Maintaining Soil Organic Matter	40	50	60	50	• Soil Conditioning Index is zero or above • Generally, crops with durable residue or cover crops, or part of the rotation in high residue conserving use crops, with reduced tillage or no-till.

Forest, Developed Land, Associated Agriculture Land

If applicable, the planner will identify this resource concern based on site-specific conditions. A threshold value of 50 will be set and the existing condition question will be triggered. The existing condition question will set the existing score as seen in Table 44.

Table 44*: Soil organism habitat loss or degradation existing condition*

Answer	Existing Condition Points
The ground is covered with plant litter in various stages of decomposition, herbaceous vegetation, and/or a biological crust that protects the soil.	51
Soil organic matter depletion exists and is uncontrolled	1
Not assessed	-1

Range

If applicable, the planner will identify this resource concern based on site-specific conditions. A threshold value of 50 will be set and the existing condition questions will be triggered. The existing condition questions will set the existing score as seen in Table 45 and Table 46.

Table 45*: Rangeland Health - Soil/Site Stability Limitations*

Answer	Existing Condition Points	Reference for Existing Condition
Not assessed	-1	
None to Slight	30	Interpreting Indicators of Rangeland Health, version 5
Slight to Moderate	26	Interpreting Indicators of Rangeland Health, version 5
Moderate	15	Interpreting Indicators of Rangeland Health, version 5
Moderate to Extreme	8	Interpreting Indicators of Rangeland Health, version 5
Extreme to Total	1	Interpreting Indicators of Rangeland Health, version 5

Table 46*: Rangeland Health - Biotic Integrity*

Answer	Existing Condition Points	Reference for Existing Condition
Not assessed	-1	
None to Slight	30	Interpreting Indicators of Rangeland Health, version 5

Slight to Moderate	26	Interpreting Indicators of Rangeland Health, version 5
Moderate	15	Interpreting Indicators of Rangeland Health, version 5
Moderate to Extreme	8	Interpreting Indicators of Rangeland Health, version 5
Extreme to Total	1	Interpreting Indicators of Rangeland Health, version 5

Pasture

If applicable, the planner will identify this resource concern based on site-specific conditions. A threshold value of 50 will be set and the PCS existing condition questions will be triggered and set the existing score as seen in Table 47, Table 48, Table 49, and Table 50.

Table 47*: Pasture Condition Score Sheet – Live or Dormant Plant Cover*

Answer	Existing Condition Points	Reference for Existing Condition
Not Assessed	-1	
High	15	• More than 95% live (non-dormant) leaf canopy. Remaining is either dead standing material, or bare ground. • Pasture Condition Score element score = 5
Good	13	• 81-95% live leaf canopy. Remaining is either dead standing material, or bare ground. • Pasture Condition Score element score = 4
Fair	4	• 66-80% live leaf canopy. Remaining is either dead standing material, or bare ground. • Pasture Condition Score element score = 3
Low	3	• 40-65% is live leaf canopy Remaining is either dead standing material, or bare ground. • Pasture Condition Score element score = 2
Poor	1	• Less than 40% is live leaf canopy. Remaining is either dead standing material, or bare ground. • Pasture Condition Score element score = 1

Table 48*: Pasture Condition Score Sheet - Plant Residue and Litter as Soil Cover*

Answer	Existing Condition Points	Reference for Existing Condition
Not Assessed	-1	
High	15	• No bare soil is seen; • Soil cover is >80% with good biological activity and decomposition of older residue.

		• Pasture Condition Score element score = 5
Good	13	• No bare soil is easily seen; • Soil cover is 61-80%. • Pasture Condition Score element score = 4
Fair	4	• Small openings of bare soil can be seen, but minimal; • Soil cover is 41-60%. • Pasture Condition Score element score = 3
Low	3	• Openings of bare soil can be seen fairly easily; • Soil cover is 21-40%. • Pasture Condition Score element score = 2
Poor	1	• Bare soil is very easily seen; • There is <20% cover on the soil surface or it is excessive, and slow to break down. • Pasture Condition Score element score = 1

Table 49*: Pasture Condition Score Sheet - Plant Diversity by Dry Weight*

Answer	Existing Condition Points	Reference for Existing Condition
Not Assessed	-1	
High	15	• Diversity: Very High • 4 dominant desirable species in 3 functional groups OR 4 dominant desirable species in 2 functional groups AND 1 additional functional group represented by minor species totaling ≥15% • Pasture Condition Score element score = 5
Good	13	• Diversity: High • 4 dominant desirable species in 2 functional groups OR 3 dominant desirable species in 3 functional groups OR 3 dominant desirable species in 2 functional groups AND 1 additional functional group represented by minor species totaling ≥15% • Pasture Condition Score element score = 4
Fair	4	• Diversity: Moderate • 3 dominant desirable species in 1 functional group OR 2-3 dominant desirable species in 2 functional groups OR 3 functional groups each represented by minor species totaling ≥15% • Pasture Condition Score element score = 3
Low	3	• Diversity: Low

		• 2 dominant desirable species in 1 functional group OR 2 functional groups each represented by minor species totaling ≥15% • Pasture Condition Score element score = 2
Poor	1	• Diversity: Very Low • <50% desirable species OR 1 dominant desirable species in 1 functional group OR no dominant desirable species and all minor species in each functional group totaling <15% • Pasture Condition Score element score = 1

Table 50: *Pasture Condition Score Sheet – Soil Compaction and Soil Regenerative Features*

Answer	Existing Condition Points	Reference for Existing Condition
Not assessed	-1	
High	15	• Compaction: No dense or platy layers; crumbly soil throughout; • Roots: Abundant growth primarily downward through the soil profile; • Color: Surface horizon dramatically darker than subsoil; • Soil Life: Signs abundant throughout. • Pasture Condition Score element score = 5
Good	13	• Compaction: Minor dense or platy layer; good aggregates common (crumbly soil): • Roots: Few horizontal, more downward through the soil profile; • Soil Life: Signs numerous throughout. • Pasture Condition Score element score = 4
Fair	4	• Compaction: Thin dense or platy layer still present; • Roots: Some horizontal with increasing downward; • Color: Surface horizon moderately darker than subsoil; • Soil Life: Signs scattered throughout. • Pasture Condition Score element score = 3
Low	3	• Compaction: Dense or moderate platy layer noticeable;

		• Roots: Numerous horizontal; moderate amount shallow/sparse; • Soil Life: Signs scattered in surface layer. • Pasture Condition Score element score = 2
Poor	1	• Compaction: Dense or thick platy layer very distinct; • Roots: Dominantly horizontal; most shallow/sparse; • Color: Surface horizon same as subsoil; • Soil Life: Few or no signs • Pasture Condition Score element score = 1

Aggregate Instability

Component: Aggregate instability

Description: Management-induced degradation of water stable soil aggregates resulting in destabilized soil carbon; surface crusting; reduced water infiltration, reduced water holding capacity, reduced aeration; depressed resilience to extreme weather; increased ponding and flooding; increased soil erosion and plant stress; and reduced habitat and soil biological activity.

Objective: Improve aggregate stability.

Analysis within CART:

Crop

If the planner determines assessment of the resource concern will occur, a Soil Data Access (Agricultural Aggregate Instability Interpretation, (https://jneme910.github.io/CART/chapters/Aggregate_stability). web service will be used to determine the percentage of soils with potential to maintain stable soil aggregates in the PLU. The Soil Data Access services utilizes the NRCS published soils database (SSURGO). The service request calculates the rolling sum values for rating acres and rating percent for each resource concern and finds the single most limiting rating (per land unit) that comprises at least 10% by area or 10 acres.

When selected for evaluation, a threshold value will be set based on the Soil Data Access web service and the existing condition question (matching what is used in soil erosion evaluations) will be triggered.

Table 51*: Aggregate Instability Threshold*

Soil Interpretation Rating	Threshold
High to Moderately High potential to maintain stable aggregates	40
Moderate potential to maintain stable aggregates	50
Low potential to maintain stable aggregates	60
No soil rating available	50

Existing condition points are based on the combination of the soil's inherent suitability for aerobic soil organism habitat with the cropping management system benefits for cover/residue/biomass of all crops and cover crops in the rotation combined with the effects of harvesting, grazing and tillage. Individual points for associated practices like crop rotation, cover crop and residue management are added to this system level credit.

Table 52*: Aggregate Instability Existing Condition Points*

Answer	**Existing Condition Points**			
	High to Moderately High potential to maintain stable aggregates	Moderate potential to maintain stable aggregates	Low potential to maintain stable aggregates	No soil rating available
Not Assessed	-1	-1	-1	-1
None – Rapidly Depleting Soil Organic Matter	0	0	0	0
Low - Depleting Soil Organic Matter	10	10	10	10
Moderate - Maintaining Soil Organic Matter	40	50	60	50

Forest, Associated Agriculture Land

The planner will identify this resource concern based on site-specific conditions. A threshold value of 50 will be set and the existing condition question will be triggered. The existing condition question will set the existing score as seen in Table 53 and the planner will identify this resource concern based on site-specific conditions. A threshold value of 50 will be set and the existing condition question will be triggered. The existing condition question will set the existing score.

Table 53*: Aggregate Instability Existing Condition Points*

Answer	Existing Condition Points

Not assessed	-1
Evidence of poor aggregate stability, such as surface crusting, lack of soil structure	1
No evidence of poor aggregate stability, such as surface crusting, lack of soil structure	51

Range

The planner will identify this resource concern based on site-specific conditions. A threshold value of 50 will be set and the existing condition question will be triggered. The existing condition question will set the existing score.

Table 54*: Aggregate Instability Existing Condition Points*

Answer	Existing Condition Points
Stability Class 6: 75-100% of soil remains on sieve after 5 dipping cycles	51
Stability Class 5: 25-75% of soil remains on sieve after 5 dipping cycles	25
Stability Class 4: 10-25% of soil remains on sieve after 5 dipping cycles	15
Stability Class 3: 50% of structural integrity lost 30-300 seconds after insertion or	10
Stability Class 2: 50% of structural integrity lost 5-30 seconds after insertion.	5
Stability Class 1: 50% of structural integrity lost within 5 seconds of insertion in water OR too unstable to sample (falls through sieve).	1
Not assessed	-1

Pasture

The planner will identify this resource concern based on site-specific conditions. A threshold value of 50 will be set and the PCS existing condition question will be triggered which will set the existing score.

Table 55: *Pasture Condition Score – Soil Compaction and Soil Regenerative Features*

Answer	Existing Condition Points	Reference for Existing Condition
Not assessed	-1	
High	60	• Compaction: No dense or platy layers; crumbly soil throughout;

		• Roots: Abundant growth primarily downward through the soil profile; • Color: Surface horizon dramatically darker than subsoil; • Soil Life: Signs abundant throughout. • Pasture Condition Score element score = 5
Good	51	• Compaction: Minor dense or platy layer; good aggregates common (crumbly soil): • Roots: Few horizontal, more downward through the soil profile; • Soil Life: Signs numerous throughout. • Pasture Condition Score element score = 4
Fair	30	• Compaction: Thin dense or platy layer still present; • Roots: Some horizontal with increasing downward; • Color: Surface horizon moderately darker than subsoil; • Soil Life: Signs scattered throughout. • Pasture Condition Score element score = 3
Low	15	• Compaction: Dense or moderate platy layer noticeable; • Roots: Numerous horizontal; moderate amount shallow/sparse; • Soil Life: Signs scattered in surface layer. • Pasture Condition Score element score = 2
Poor	1	• Compaction: Dense or thick platy layer very distinct; • Roots: Dominantly horizontal; most shallow/sparse; • Color: Surface horizon same as subsoil; • Soil Life: Few or no signs • Pasture Condition Score element score = 1

Water

Ponding and Flooding

Component: Ponding and flooding

Description: Water covering the land surface, along with saturated conditions below the surface, degrades natural resources, or restricts capability of land to support its intended use.

Objective: Reduce the risk of natural resource degradation, or limitation to land use caused by flooding or ponding.

Analysis within CART:

Crop, Forest, Range, Pasture, Farmstead, Developed Land, Associated Agriculture Land

A standard threshold of 50 will be used for Ponding and Flooding. In the future, each PLU, regardless of land use, will trigger a soil data web service (https://jneme910.github.io/CART/chapters/Ponding_or_Flooding) to determine flood frequency and ponding frequency rating of occasional, frequent, or very frequent for any major soil component and will also trigger a web service to evaluate if the PLU is within a 100-year flood plain according to FEMA maps. Either condition will set the resource concern as having been identified through the webservice and marked accordingly. It is anticipated few sites will have FEMA flood plain maps and the use of the map will be a secondary source of information as well as support use of the web service in addressing the special environmental concerns associated with floodplains. The planner may identify the presence or absence of this resource concern based on site specific conditions and manually select the resource concern. The existing condition question will set the existing score as seen in Table 56.

Table 56*: Ponding and/or Flooding Existing Condition*

Answer	Existing Condition Points
Occurs but does not negatively affect the intended use of the PLU	51
Occurs and negatively affects the intended use of the PLU	1
Does not occur on the PLU	0
Not assessed	-1

Seasonal High Water Table

Component: Seasonal high water table

Description: Groundwater or a perched water table causing saturated conditions near the surface degrades water resources or restricts capability of land to support its intended use.

Objective: Reduce the risk of natural resource degradation or limitation to land use caused by a seasonal high water table.

Analysis within CART:

Crop, Forest, Range, Pasture, Farmstead, Developed Land, Associated Agriculture Land, Other Rural Land

A standard threshold of 50 will be used for Seasonal High Water Table. Currently the planner will identify the presence or absence of this resource concern based on site specific conditions and manually select the resource concern.

In the future each PLU will trigger a soil data web service (https://jneme910.github.io/CART/chapters/Depth_to_Water_Table) to determine if the water table is within 18 inches of the surface. If a high water table is identified through the service, the resource concern will be identified as being possible from the webservice and marked accordingly.

The existing condition score will be set by the planner as seen in Table 57: .

Table 57: *Seasonal High Water Table Existing Condition*

Answer	Existing Condition Points
Occurs but does not negatively affect the intended use of the PLU	51
Occurs and negatively affects the intended use of the PLU	1
Does not occur on the PLU	0
Not assessed	-1

Seeps

Component: Seeps

Description: Sub-surface saturated flows that percolate slowly to the surface, degrades water resources, or restrict capability of land to support its intended use.

Objective: Reduce the risk of natural resource degradation or limitation to land use caused by a seep.

Analysis within CART:

Crop, Forest, Range, Pasture, Farmstead, Developed Land, Associated Agriculture Land, Other Rural Land

A standard threshold of 50 will be used for Seeps. Currently the planner will identify the presence or absence of this resource concern based on site specific conditions and manually select the resource concern.

In the future each PLU will trigger a soil data web service (https://jneme910.github.io/CART/chapters/Hydric_Rating_by_Map_Unit) to determine if the soil map unit has a hydric rating of 1 or greater in Web Soil Survey and occurs on a representative slope gradient of 3% or more. If seeps are identified via the webservice, CART will designate they are possible and marked accordingly. If the web service doesn't trigger a positive response to the parameters, the planner may identify the presence or absence of this resource concern based on photo interpretation and/or site-specific conditions. These conditions will include "wet spot" special point features on a Web Soil Survey map, aerial imagery showing vegetation color and type differences consistent with a seep pattern, or both.

The existing condition question will set the existing score as seen in Table 58: .

Table 58: *Seeps Existing Condition*

Answer	Existing Condition Points
Do not negatively affect the intended use of the PLU.	51
Negatively affect the intended use of the PLU.	1
Not assessed	-1
Does not occur on PLU.	0

Drifted Snow

Component: Drifted snow

Description: Wind-blown snow accumulates around and over surface structures, which restricts access to humans and animals; or wind removes snow from desired locations where it can be used to accumulate water.

Objective: Control where snow drifts accumulate.

Analysis within CART:

Crop, Forest, Range, Pasture, Farmstead, Developed Land, Associated Agriculture Land, Other Rural Land

Each PLU will default to a "not assessed" status for drift snow. The planner will identify this resource concern based on site-specific conditions. A threshold value of 50 will be set and existing condition

question will be triggered. The existing condition question will set the existing score as seen in Table 59*:*
.

Table 59*: Drifted Snow Existing Condition*

Note: Drifted snow typically is thought of as a negative affect when it accumulates in unwanted locations. Consider the beneficial effects of forcing snow to accumulate in strategic locations for such things as snow melt for season soil moisture or supplemental water for livestock.

Answer	Existing Condition Points
Does not occur on PLU	0
Causes damage to buildings or structures; interferes with livestock access to food, water, or shelter; interferes with access to essential agricultural operations; planner or client can document that retention or accumulation of snow in strategic locations is beneficial to the enterprise.	1
Does not cause damage to buildings or structures; interfere with livestock accessing food, water, or shelter; interfere with access to essential agricultural operations; planner or client can document that retention or accumulation of snow in strategic locations is not needed.	51

Surface Water Depletion

Component: Surface water depletion

Description: Water from collected precipitation runoff, ponds, lakes, surface watercourses, and reservoirs is used at a rate that is detrimental to ecological functions or other identified uses and threatens sustained availability of surface water.

Objective: Reduce surface water depletion.

Analysis within CART:

Any Land Use

Each PLU for any land use will default to a “not assessed” status for Surface water depletion. Table 60 will be used to assess the existing condition through observation for all land uses. The threshold value for surface water depletion will be set at 50.

Table 60*: Surface Water Depletion Existing Condition*

Answer	Existing Condition Points
PLU activities do not affect water withdrawals	60
PLU activities are commensurate with available water supplies and/or meet state/local regulations	51
PLU activities contribute to depletions and/or do not meet state/local regulations	1
Not assessed	-1

Groundwater Depletion

Component: Groundwater depletion

Description: Underground water is used at a rate greater than aquifer recharge.

Objective: Reduce the risk of natural resource degradation, or limitation to land use caused by groundwater depletion

Analysis within CART:

Crop, Forest, Range, Pasture, Farmstead, Developed Land, Associated Agriculture Lands, Other Rural Land

Each PLU will default to a "not assessed" status for Groundwater depletion. Table 61 will be used to assess the existing condition through observation for all land uses. The threshold value for Groundwater depletion will be 50.

Table 61*: Groundwater Depletion Existing Condition*

Answer	Existing Condition Points
PLU activities do not affect water withdrawals	60
PLU activities are commensurate with available water supplies and/or meet state/local regulations	51
PLU activities contribute to depletions and/or do not meet state/local regulations	1
Not assessed	-1

Naturally Available Moisture Use

Components: Moisture management and drought susceptibility

Description: Natural precipitation is not optimally managed to support desired land use goals or ecological processes.

Objective: Manage natural precipitation more efficiently.

Analysis within CART:

Each PLU will default to a "not assessed" status for naturally available moisture use. Table 62 will be used to assess the existing condition through observation for all land uses except for range and pasture.

The appropriate Pasture Condition Score and Interpreting Indicators of Rangeland Health questions will be used to assess the existing condition through observation on Range and Pasture. A threshold value for naturally available moisture use will be set at 50.

Crop, Forest, Developed Land, Associated Agriculture Land

Table 62*: Naturally Available Moisture Is Being Managed to the Extent Possible*

Answer	Existing Condition Points
Yes	51
No	1
Not assessed	-1

Pasture

Table 63: *Pasture Condition Score Sheet – Soil Compaction and Soil Regenerative Features*

Answer	Existing Condition Points	Reference for Existing Condition
Not assessed	-1	
High	30	• Compaction: No dense or platy layers; crumbly soil throughout; • Roots: Abundant growth primarily downward through the soil profile; • Color: Surface horizon dramatically darker than subsoil; • Soil Life: Signs abundant throughout. • Pasture Condition Score element score = 5

Good	26	• Compaction: Minor dense or platy layer; good aggregates common (crumbly soil): • Roots: Few horizontal, more downward through the soil profile; • Soil Life: Signs numerous throughout. • Pasture Condition Score element score = 4
Fair	17	• Compaction: Thin dense or platy layer still present; • Roots: Some horizontal with increasing downward; • Color: Surface horizon moderately darker than subsoil; • Soil Life: Signs scattered throughout. • Pasture Condition Score element score = 3
Low	8	• Compaction: Dense or moderate platy layer noticeable; • Roots: Numerous horizontal; moderate amount shallow/sparse; • Soil Life: Signs scattered in surface layer. • Pasture Condition Score element score = 2
Poor	1	• Compaction: Dense or thick platy layer very distinct; • Roots: Dominantly horizontal; most shallow/sparse; • Color: Surface horizon same as subsoil; • Soil Life: Few or no signs • Pasture Condition Score element score = 1

Table 64*: Pasture Condition Score – Live or Dormant Plant Cover*

Answer	Existing Condition Points	Reference for Existing Condition
Not Assessed	-1	
High	30	• More than 95% live (non-dormant) leaf canopy. Remaining is either dead standing material, or bare ground. • Pasture Condition Score element score = 5
Good	26	• 81-95% live leaf canopy. Remaining is either dead standing material, or bare ground. • Pasture Condition Score element score = 4

Fair	17	• 66-80% live leaf canopy. Remaining is either dead standing material, or bare ground. • Pasture Condition Score element score = 3
Low	8	• 40-65% is live leaf canopy Remaining is either dead standing material, or bare ground. • Pasture Condition Score element score = 2
Poor	1	• Less than 40% is live leaf canopy. Remaining is either dead standing material, or bare ground. • Pasture Condition Score element score = 1

Range

Table 65: *Rangeland Health - Hydrologic Function*

Answer	Existing Condition Points	Reference for Existing Condition
Not assessed	-1	
None to Slight	60	Interpreting Indicators of Rangeland Health, version 5
Slight to Moderate	51	Interpreting Indicators of Rangeland Health, version 5
Moderate	25	Interpreting Indicators of Rangeland Health, version 5
Moderate to Extreme	15	Interpreting Indicators of Rangeland Health, version 5
Extreme to Total	1	Interpreting Indicators of Rangeland Health, version 5

Inefficient Irrigation Water Use

Component: Inefficient irrigation water use

Description: Irrigation water is not stored, delivered, scheduled, and/or applied efficiently.

Objective: Manage irrigation water efficiently.

Analysis within CART:

Crop, Forest, Range, Pasture, Farmstead, Developed Land, Associated Agriculture Land, Other Rural Land

Each PLU with "irrigated" assigned as a land use modifier will trigger the assessment with a threshold of 50 being set. The existing condition question will set the existing score as seen in Table 66: .

Table 66: *Irrigation System Existing Condition*

Note: System includes point of diversion (on site or off site), delivery ditches, canals, or pipelines (on site or off site), and on field delivery and application.

Answer	Existing Condition Points
Not assessed	-1
Irrigation water is being transported to, stored on, and/or applied to PLU in a manner that controls a known volume, frequency, and rate of application	51
Irrigation water is poorly managed or fails to meet critical crop growth needs even when water is available.	40
The irrigation delivery system is inadequate to control the rate of flow through the system and to the field, the conveyance system (ditches, canals, and/or reservoirs) has obvious leaks or soils that are naturally erosive, susceptible to excessive seepage, or both (e.g., sandy and gravelly soils)	30
The on-field irrigation method is uncontrolled flood and/or improvements to on-field application system will benefit natural resources	20

Nutrients Transported to Surface Water (field loss)

Components: Nonpoint nitrogen surface loss and nonpoint phosphorus surface loss

Description: Applied nutrients are transported beyond the edge of the field and have the potential to contaminate surface waters in quantities that degrade water quality and limit its use.

Objective: Reduce nonpoint nutrient transport beyond the edge of the field to an average of less than the established threshold value by requiring a level of conservation management that is appropriate for each site's potential for nonpoint nutrient runoff.

Analysis within CART:

Crop and Pasture

Each PLU will have the PLU soil runoff potential determined. Each soil map unit within the PLU will be categorized into one of four soil runoff potential classes through the Water Quality Management Services - Soil Runoff, based on its published map unit components. This service utilizes the NRCS published soils database (SSURGO) according to the charts in Table 67, Table 68, and Table 69. Dual

hydrologic group soils with an apparent water table in the rootzone will default their runoff rating to the drained phase if the PLU is drained and to the undrained phase if the PLU is not drained. The acre weighted average for the PLU is then determined based on ratings for each soil map unit in the PLU.

Table 67*: Soil Runoff Potential: Drained/No High Water Table*

Soil Runoff Potential	A	B	C	D
Low =0	ALL	Slope < 4	Slope < 2	Slope < 2 AND kfactor < 0.28
Moderate =1	-	Slope >= 4 AND Slope <= 6 AND kfactor < 0.32	Slope >= 2 AND slope <= 6 AND kfactor < 0.28	Slope < 2 AND kfactor >= 0.28
Moderately High =2	-	Slope>= 4 AND slope <= 6 AND kfactor >= 0.32	slope>= 2 AND slope <= 6 AND kfactor >= 0.28	(slope>= 2 AND slope <= 4)
High =3	-	Slope > 6	Slope > 6	Slope > 4

Table 68*: Soil Runoff Potential: If High Water Table Kind is Perched or Apparent and High Water Table is <= 61 cm AND Not Drained*

Soil Runoff Potential	A	B	C	D
Low =0	-	-	-	-
Moderate =1	-	-	-	-
Moderately High =2	-	-	-	-
High =3	All	All	All	All

Table 69*: Soil Runoff Potential: Dual hydrologic soil groups A/D, BD, C/D that are not drained*

Soil Runoff Potential	A/D	B/D	C/D
Low =0	-	-	-
Moderate =1	-	-	-
Moderately High =2	-	-	-
High =3	All	All	All

Irrigation Adjustment:

Using the R factor from Water Quality R factor service modified by the amount of irrigation and the PLU soil runoff potential, determine the threshold of conservation management points necessary to meet the assessment threshold. **Note that Nutrients Transported to Surface Water has a nitrogen**

component and a phosphorus component that each have separate thresholds established as seen in Table 70 **and** Table 71**.**

Table 70*: Determining Nonpoint Nitrogen Surface Loss Threshold*

Soil Vulnerability to Runoff	R Factor			
	≤50	>50-150	>150-250	>250
High	25	55	70	90
Moderately High	25	40	40	45
Moderate	25	40	40	40
Low	25	30	30	30

Table 71*: Determining Nonpoint Phosphorus Surface Loss Threshold*

Soil Vulnerability to Runoff	R Factor			
	≤50	>50-150	>150-250	>250
High	25	60	75	100
Moderately High	20	40	50	75
Moderate	20	25	25	30
Low	15	15	20	20

For cropland, the two existing condition questions below will set the existing condition points as seen in Table 72 and Table 73.

Table 72*: Existing Condition – Nutrient Application*

Answer	Existing Condition Points	Reference for Assessment Condition
Not assessed	-1	Unknown if nutrients are applied.
No nutrients applied	51	No organic or inorganic nutrients are applied mechanically or by hand. Note that this does not include nutrients deposited by grazing animals when these are the only nutrients applied to the PLU.

Nutrients are applied	0	Organic or inorganic nutrients are applied to the PLU mechanically or by hand.

Table 73*: Existing Condition - Cover/Residue/Biomass Crop Rotation Credit*

Existing Condition - Crop Rotation Credit Based on system benefits for cover/residue/biomass of all crops and cover crops in the rotation combined with the effects of harvest/grazing and tillage system. ***Note that individual credits for associated practices like crop rotation, cover crop and residue management are added to this system level credit.***	**Nitrogen Runoff**	**Phosphorus Runoff**
None – Rapidly Depleting Soil Organic Matter • Soil Conditioning Index is well below zero • Generally, fallow or crops with no durable residue or cover crops, with up to full field tillage.	0	0
Low – Depleting Soil Organic Matter • Soil Conditioning Index is moderately below zero • Generally, crops with durable residue or cover crops, or part of the rotation in high residue conserving use crops, with up to full field tillage.	2	5
Moderate – Maintaining Soil Organic Matter • Soil Conditioning Index is at or moderately above zero • Generally, crops with durable residue or cover crops, or part of the rotation in high residue conserving use crops, with reduced tillage or no-till.	5	10
High – Building Soil Organic Matter • Soil Conditioning Index is well above zero • Generally, high residue conserving use crops or perennial crops with full ground cover, not tilled or tilled infrequently.	10	15

For pasture, the existing condition questions below will set the existing condition points as seen in Table 74 and Table 75.

Table 74*: Existing Condition – Nutrient Application*

Answer	Existing Condition Points	Reference for Assessment Condition
Not assessed	-1	Unknown if nutrients are applied.
No nutrients applied	51	No organic or inorganic nutrients are applied mechanically or by hand. Note

		that this does not include nutrients deposited by grazing animals when these are the only nutrients applied to the PLU.
Nutrients are applied	0	Organic or inorganic nutrients are applied to the PLU mechanically or by hand.

Table 75: *Pasture Condition Score Sheet - Erosion*

Answer	Nitrogen Runoff Existing Condition Points	Phosphorus Runoff Existing Condition Points	Reference for Existing Condition
Not assessed	-1	-1	
High	10	15	• Sheet and Rill: Plant density high, no runoff, good infiltration. No evidence of present or past erosion. • Pasture Condition Score element score = 5
Good	5	10	• Sheet and Rill: Plant density high, runoff low, good infiltration. May have evidence of past erosion if present. • Pasture Condition Score element score = 4
Fair	2	5	• Sheet and Rill: Plant density good and runoff moderate. If present, erosion concentrated on heavily used areas. • Pasture Condition Score element score = 3
Low	1	2	• Sheet and Rill: Plant density slows runoff. Erosion present and easily seen on steeper terrain. • Pasture Condition Score element score = 2
Poor	0	0	• Sheet and Rill: Plant density is insufficient to stop runoff and poor infiltration. Erosion easily visible throughout pasture. • Pasture Condition Score element score = 1

Nutrients Transported to Groundwater (field loss)

Components: Nonpoint nitrogen leaching loss and nonpoint phosphorus leaching loss

Description: Applied nutrients are transported below the rootzone and have the potential to contaminate groundwater in quantities that could degrade water quality and limit its use.

Objective: Reduce nonpoint nutrient transport below the rootzone to groundwater to an average of less than 25 pounds of nitrogen and 1 pound of phosphorus per acre per year by requiring a level of management that is appropriate for each site's potential for nonpoint nutrient leaching.

Analysis within CART:

Crop and Pasture

Each PLU will have the PLU soil leaching potential determined. Each soil map unit within the PLU will be categorized into one of four soil leaching potentials through the Water Quality Management Services - Soil Leaching, based on published map unit components. The service utilizes the NRCS-published soils database (SSURGO) for mineral soils with no high water table according to the chart in Table 76. Dual hydrologic group soils with an apparent water table in the rootzone will default their leaching rating to High whether the PLU is drained or undrained. The acre weighted average rating for the PLU is then determined based on ratings for each soil map unit in the PLU.

Table 76*: Soil Leaching Potential*

Nutrient Leaching Potential (NLP)	A	B	C	D
Low =0	-	-	-	ALL
Moderate =1	-	(Slope <= 12 AND kfact >= 0.24) OR slope > 12	ALL	-
Moderately High =2	Slope > 12	Slope >= 3 AND slope <= 12 AND kfact < 0.24	-	-
High =3	Slope <=12	Slope < 3 AND kfactor < 0.24		

Exceptions:

High:

- Dual hydrologic soil group (A/D, B/D, C/D)
- Water table kind = "Apparent" AND High Water Table <= 76 cm)
- Taxonomic order = Histosols

Note: Drainage has no effect on leaching potential.

Coarse Fragment correction:

If coarse fragment volume > 30 then + 2 to NSLP (Note: final maximum NSLP is 3)

If coarse fragment volume > 10 AND <= 30 then + 1 to NSLP (Note: final maximum NSLP is 3)

Irrigation Adjustment:

Using the R factor from Water Quality R factor service modified by the amount of irrigation and the PLU soil leaching potential, determine the threshold of conservation management points necessary to meet the assessment threshold. **Note that Nutrients Transported to Groundwater has a nitrogen component and a phosphorus component that each have separate thresholds established as seen in** Table 77 **and** Table 78**.**

Table 77*: Determining Nonpoint Nitrogen Leaching Loss Threshold*

Leaching Vulnerability	R Factor			
	≤50	>50-150	>150-250	>250
High	25	45	45	50
Moderately High	25	35	40	45
Moderate	25	30	35	45
Low	25	30	30	45

Table 78*: Determining Nonpoint Phosphorus Leaching Loss Threshold*

Leaching Vulnerability	R Factor			
	≤50	>50-150	>150-250	>250
High	15	20	35	55
Moderately High	10	15	35	55
Moderate	10	15	30	55
Low	10	10	20	45

For cropland, the two existing condition questions below will set the existing condition points as seen Table 79 and Table 80.

Table 79*: Existing Condition – Nutrient Application*

Answer	Existing Condition Points	Reference for Assessment Condition
Not assessed	-1	Unknown if nutrients are applied.
No nutrients applied	51	No organic or inorganic nutrients are applied mechanically or by hand. Note that this does not include nutrients deposited by grazing animals when these are the only nutrients applied to the PLU.
Nutrients are applied	0	Organic or inorganic nutrients are applied to the PLU mechanically or by hand.

Table 80*: Existing Condition - Cover/Residue/Biomass Crop Rotation Credit*

Existing Condition - Crop Rotation Credit Based on system benefits for cover/residue/biomass of all crops and cover crops in the rotation combined with the effects of harvest/grazing and tillage system. ***Note that individual credits for associated practices like crop rotation, cover crop and residue management are added to this system level credit.***	**Nitrogen Leaching**	**Phosphorus Leaching**
None – Rapidly Depleting Soil Organic Matter • Soil Conditioning Index is well below zero • Generally, fallow or crops with no durable residue or cover crops, with up to full field tillage.	0	0
Low – Depleting Soil Organic Matter • Soil Conditioning Index is moderately below zero • Generally, crops with durable residue or cover crops, or part of the rotation in high residue conserving use crops, with up to full field tillage.	2	2
Moderate – Maintaining Soil Organic Matter • Soil Conditioning Index is at or moderately above zero • Generally, crops with durable residue or cover crops, or part of the rotation in high residue conserving use crops, with reduced tillage or no-till.	5	5
High – Building Soil Organic Matter • Soil Conditioning Index is well above zero • Generally, high residue conserving use crops or perennial crops with full ground cover, not tilled or tilled infrequently.	10	10

For pasture, the existing condition questions below will set the existing condition points as seen in Table 81 and Table 82.

Table 81*: Existing Condition – Nutrient Application*

Answer	Existing Condition Points	Reference for Assessment Condition
Not assessed	-1	Unknown if nutrients are applied.
No nutrients applied	51	No organic or inorganic nutrients are applied mechanically or by hand. Note that this does not include nutrients deposited by grazing animals when these are the only nutrients applied to the PLU.
Nutrients are applied	0	Organic or inorganic nutrients are applied to the PLU mechanically or by hand.

Table 82: *Pasture Condition Score Sheet - Erosion*

Answer	Nitrogen Runoff Existing Condition Points	Phosphorus Runoff	Reference for Existing Condition
Not assessed	-1	-1	
High	10	10	• Sheet and Rill: Plant density high, no runoff, good infiltration. No evidence of present or past erosion. • Pasture Condition Score element score = 5
Good	5	5	• Sheet and Rill: Plant density high, runoff low, good infiltration. May have evidence of past erosion if present. • Pasture Condition Score element score = 4
Fair	2	2	• Sheet and Rill: Plant density good and runoff moderate. If present, erosion concentrated on heavily used areas. • Pasture Condition Score element score = 3

Low	1	1	• Sheet and Rill: Plant density slows runoff. Erosion present and easily seen on steeper terrain. • Pasture Condition Score element score = 2
Poor	0	0	• Sheet and Rill: Plant density is insufficient to stop runoff and poor infiltration. Erosion easily visible throughout pasture. • Pasture Condition Score element score = 1

Nutrients Transported to Surface Water (storage and handling of pollutants)

Component 1: Concentrated nutrient and pathogen effluent from domestic animal confinement, including milkhouse waste and silage leachate

Description: Concentrated nutrients and pathogen effluent from domestic animal confinement (including milkhouse waste and silage leachate) impact surface waters in sufficient quantities that degrade water quality and may limit its use.

Objective: Reduce concentrated losses of nutrients and pathogen from domestic animal confinement by requiring appropriate management wherever concentrated sources of contaminants are identified by the planner.

Analysis within CART:

Crop, Forest, Pasture, Farmstead, Developed Land, Associated Agriculture Land, Other Rural Land

Each PLU will default to a "not assessed" status for the resource concern: nutrients and pathogens under the Nutrients transported – Surface Water resource concern. The planner will identify the applicable resource concern based on site-specific conditions. A standard threshold of 50 points will be set.

Table 83*: Concentrated nutrient and pathogen effluent discharged or stored on the PLU*

Note: (Both agricultural including milkhouse waste, feedstocks such as grains, silage, etc. and non-agricultural such as food waste)

Answer	Existing Condition Points
Not applicable - Nutrient and pathogen effluents are **NOT discharged or stored** on the PLU.	60
Not assessed - Nutrient and pathogen effluents **ARE discharged or stored** on the PLU and **UNKNOWN** if adequate control/treatment is in place.	-1

Nutrient and pathogen effluents **ARE discharged or stored** on the PLU and adequate control/treatment is **NOT** in place.	0
Nutrient and pathogen effluents **ARE discharged or stored** on the PLU and adequate control/treatment IS in place.	51

Component 2: Concentrated nutrient and pathogen surface loss from domestic animals standing in surface water

Description: Concentrated nutrients and pathogens are lost when domestic animals have direct access to surface waters in sufficient quantities that degrade water quality and limits its use.

Objective: Reduce concentrated losses of nutrients and pathogen from direct domestic animal access to surface water by requiring appropriate management wherever concentrated sources of contaminants are identified by the planner.

Analysis within CART:

Crop, Forest, Pasture, Farmstead, Developed Land, Associated Agriculture Land, Other Rural Land

Each PLU will default to a "not assessed" status for the resource concern: nutrients and pathogens under the Nutrients transported – Surface Water resource concern. The planner will identify the applicable resource concern based on site-specific conditions. A standard threshold of 50 points will be set.

Table 84*: Animal Access to Surface Waterbodies*

Answer	Existing Condition Points
Not applicable - Animals do **NOT** have direct access to surface water bodies	60
Not assessed - Is UNKNOWN if animals have direct access to surface water bodies	-1
Animals have UNCONTROLLED access to surface water bodies	0
Animals have CONTROLLED access to surface water bodies	51

Component 3: Concentrated nutrient and pathogen surface loss from storage and handling of manure, compost, biosolids, or non-ag food waste

Description: Manures, biosolids, compost, non-ag food wastes or other soil amendment and pathogen sources are present on the PLU, so they have the potential to contaminate surface waters. The planner will identify this resource concern based on site-specific conditions.

Objective: Control accidental release of manures, biosolids, compost, or other nutrient and pathogen sources products to prevent contamination of surface waters.

Analysis within CART:

Crop, Forest, Pasture, Farmstead, Developed Land, Associated Agriculture Land, Other Rural Land

Each PLU will default to a "not assessed" status for manures, biosolids, compost, or other nutrient and pathogen sources. The planner will identify this resource concern based on site-specific conditions. A planning threshold value of 50 will be set and the three existing condition questions will be triggered. The existing condition questions (Yes/No) will set the existing score as seen in Table 85.

Table 85*: Manures, Biosolids, Compost, or Other Soil Amendment and Pathogen Sources Stockpiled or Stored on PLU*

Answer	Existing Condition Points
Not applicable	0
Not assessed	-1
Only solid material storage - contained	51
Only solid material storage - not contained	1
Liquid or mixed manure storage - contained	51
Liquid or mixed manure storage – contained, aerobic or covered	51
Liquid or mixed manure storage - not contained	1

Nutrients Transported to Groundwater (storage and handling of pollutants)

Component 1: Concentrated nutrient and pathogen leaching loss from domestic animal confinement, including milkhouse waste and silage leachate

Description: Concentrated nutrients and pathogen effluent from domestic animal confinement (including milkhouse waste and silage leachate) impact groundwater in sufficient quantities that degrade water quality and may limit its use.

Objective: Reduce concentrated losses of nutrients and pathogen from domestic animal confinement by requiring appropriate management wherever concentrated sources of contaminants are identified by the planner.

Analysis within CART:

Crop, Forest, Pasture, Developed Land, Associated Agriculture Land, Other Rural Land

Each PLU will default to a "not assessed" status for the resource concern: nutrients and pathogens under the Nutrients transported – Groundwater resource concern. The planner will identify the applicable resource concern based on site-specific conditions. A standard threshold of 50 points will be set.

Table 86*: Concentrated nutrient and pathogen effluent discharged or stored on the PLU*

Note: (both agricultural including milkhouse waste, feedstocks such as grains, silage, etc. and non-agricultural such as food waste)

Answer	Existing Condition Points
Not applicable - Nutrient and pathogen effluents are **NOT discharged or stored** on the PLU.	60
Not assessed - Nutrient and pathogen effluents **ARE discharged or stored** on the PLU and **UNKNOWN** if adequate control/treatment is in place.	-1
Nutrient and pathogen effluents **ARE discharged or stored** on the PLU and adequate control/treatment is **NOT** in place.	0
Nutrient and pathogen effluents **ARE stored** on the PLU and adequate control/treatment IS in place.	51

Component 2: Concentrated nutrient and pathogen leaching loss from storage and handling of manure, compost, biosolids, and non-ag food waste

Description: Manures, biosolids, compost, non-ag food wastes or other soil amendment and pathogen sources are present on the PLU, so they have the potential to contaminate groundwater. The planner will identify this resource concern based on site-specific conditions.

Objective: Control accidental release of manures, biosolids, compost, or other nutrient and pathogen sources products to prevent contamination of groundwater.

Analysis within CART:

Crop, Forest, Pasture, Developed Land, Associated Agriculture Land, Other Rural Land

Each PLU will default to a "not assessed" status for manures, biosolids, compost, or other nutrient and pathogen sources. The planner will identify this resource concern based on site-specific conditions. A standard threshold value of 50 will be set. The existing condition questions will set the existing score as seen in Table 87 below.

Table 87*: Manures, Biosolids, Compost, or Other Soil Amendment and Pathogen Sources Stockpiled or Stored on the PLU*

Answer	Existing Condition Points
Not applicable	0
Not assessed	-1
Only solid material storage - contained	51
Only solid material storage - not contained	1
Liquid or mixed manure storage - contained	51
Liquid or mixed manure storage – contained, aerobic or covered	51
Liquid or mixed manure storage - not contained	1

Pesticides Transported to Surface Water

Component 1: Nonpoint pesticide surface loss

Description: Applied pesticides move offsite in runoff or drift and have the potential to be transported to surface water sources in quantities that degrade water quality and limit its use.

Objective: Reduce hazardous nonpoint pesticide losses in surface runoff or drift that can be transported to surface water sources.

Analysis within CART:

Any Land Use

Each PLU will have the PLU soil runoff potential determined. Each soil map unit within the PLU will be categorized into one of four soil runoff potentials through the Water Quality Management Services - Soil Runoff, based on its published map unit components. This service utilizes the NRCS-published soils database (SSURGO) according to the charts in Table 88, Table 89, and Table 90. The acre weighted average rating for the PLU is then determined based on ratings for each soil map unit in the PLU. Note that for CART analysis these runoff ratings do not split out solution runoff and adsorbed runoff the way the Windows Pesticide Screening Tool (WIN-PST) does to support the application of the Integrated Pest Management Conservation Practice (Code 595).

Table 88*: Soil Runoff Potential: Drained/No High Water Table*

Soil Runoff Potential	A	B	C	D
Low =0	ALL	Slope < 4	Slope < 2	Slope < 2 AND kfactor < 0.28
Moderate =1	-	Slope >= 4 AND Slope <= 6 AND kfactor < 0.32	Slope >= 2 AND slope <= 6 AND kfactor < 0.28	Slope < 2 AND kfactor >= 0.28
Moderately High =2	-	Slope>= 4 AND slope <= 6 AND kfactor >= 0.32	slope>= 2 AND slope <= 6 AND kfactor >= 0.28	(slope>= 2 AND slope <= 4)
High =3	-	Slope > 6	Slope > 6	Slope > 4

Table 89*: Soil Runoff Potential: If High Water Table Kind is Perched or Apparent and High Water Table is <= 61 cm AND Not Drained*

Soil Runoff Potential	A	B	C	D
Low =0	-	-	-	-
Moderate =1	-	-	-	-
Moderately High =2	-	-	-	-
High =3	All	All	All	All

Table 90*: Soil Runoff Potential: Dual hydrologic soil groups A/D, BD, C/D that are not drained*

Soil Runoff Potential	A/D	B/D	C/D
Low =0	-	-	-
Moderate =1	-	-	-
Moderately High =2	-	-	-
High =3	All	All	All

Each PLU will have the PLU R factor class determined by the R Factor Service. If the service is not available, the user will manually answer the question in CART. The R factor class result will be matrixed with the acre weighted average soil rating for the PLU in Table 91.

Table 91*: Determining Nonpoint Pesticide Surface Loss Threshold*

	R Factor

Soil Vulnerability to Runoff	Dry Climate: ≤50 R Factor	Humid Climate: >50 R Factor
High	30	60
Moderately High	30	60
Moderate	30	60
Low	15	30

Pesticide risk existing condition credit will come from the worst-case selection for the PLU.

Crop

For cropland the highest risk crop in the rotation should be selected for the Crop Group to inform the Pesticide Use and Risk category choice, and "High" should be the default when Pesticide Use and Risk is unknown.

Table 92*: Cropping Risk Categories for Pesticide Loss*

Answer	Pesticide Use and Risk	Existing Condition Score Dry Climate	Existing Condition Score Humid Climate
1. Unknown	High	1	1
2. Orchards, vineyards, berries and nut crops	High	1	1
3. Vegetable Crops	High	1	1
4. Cotton	High	1	1
5. Seed crops	High	1	1
6. Flooded rice and cranberry crops	High	1	1
7. Turfgrass for sod and nursery crops	High	1	1
8. Close grown crops - residue not harvested	Moderate	10	20
9. Close grown crops – residue removed	Moderate	10	20
10. Row crops – durable residue not harvested	Moderate	10	20
11. Row crops - residue removed or fragile	Moderate	10	20
12. Christmas trees	Moderate	10	20
13. Hay crops - forage	Low	15	30

Table 93*: Existing Condition - Cover/Residue/Biomass Crop Rotation Credit*

Existing Condition - Crop Rotation Credit Based on system benefits for cover/residue/biomass of all crops and cover crops in the rotation combined with the effects of harvest/grazing and tillage system. ***Note that individual credits for associated practices like crop rotation, cover crop and residue management are added to this system level credit.***	**Pesticide Runoff**
None – Rapidly Depleting Soil Organic Matter • Soil Conditioning Index is well below zero • Generally, fallow or crops with no durable residue or cover crops, with up to full field tillage.	0
Low – Depleting Soil Organic Matter • Soil Conditioning Index is moderately below zero • Generally, crops with durable residue or cover crops, or part of the rotation in high residue conserving use crops, with up to full field tillage.	10
Moderate – Maintaining Soil Organic Matter • Soil Index is at or moderately above zero • Generally, crops with durable residue or cover crops, or part of the rotation in high residue conserving use crops, with reduced tillage or no-till.	20
High – Building Soil Organic Matter • Soil Conditioning Index is well above zero • Generally, high residue conserving use crops or perennial crops with full ground cover, not tilled or tilled Conditioning infrequently.	30

Non-Cropland

Table 94*: Pesticide Use and Risk Category (non-Cropland)*

Answer	Existing Condition Score Dry Climate	Existing Condition Score Humid Climate
Low	15	30
None	30	60

Any Land Use

Table 95*: Integrated Pest Management – IPM System*

Note: What kind of Integrated Pest Management (IPM) System is implemented on the PLU to manage pests and pesticide environmental risk?

Answer	Existing Condition Points	Reference for Assessment Condition
Not assessed	-1	
Pest Management Conservation System (Code 595) - Full IPM System for Efficient Production and Environmental Protection	51	A full IPM System is utilized including Prevention, Avoidance, Monitoring, and Suppression to manage pests (including invasive plants) to meet production needs and manage pesticide environmental risk, including Windows Pesticide Screening Tool results for risks to water quality. If this answer is selected, do NOT select Practice code 595 on the Existing or Planned Practices pages so as not to double count points.
Full IPM System for Efficient Production	25	A full IPM System is utilized including Prevention, Avoidance, Monitoring, and Suppression to manage pests (including invasive plants) to meet production needs.
No IPM System, but pesticides are used to manage pests.	1	An IPM System is not utilized, but pesticides are applied according to label guidance to manage pests (including invasive plants) to meet production needs.
No IPM System, but pesticides are used to manage pests and spray drift is minimized.	1	An IPM system is not utilized, but pesticides are applied according to label guidance to manage pests (including invasive plants) to meet production needs, and pesticide drift is minimized with drift reducing spray technologies.
No IPM System, but pesticides are used to manage pests and the development of pest resistance is carefully managed.	1	An IPM system is not utilized, but pesticides are applied according to label guidance to manage pests (including invasive plants) to address production needs and the development of pest resistance is carefully managed.

No IPM System, but pesticides are used to manage pests, the development of pest resistance is carefully managed, and spray drift is minimized.	1	An IPM system is not utilized, but pesticides are applied according to label guidance to manage pests (including invasive plants) to address production needs, the development of pest resistance is carefully managed, and pesticide drift is minimized with drift reducing spray technologies.
No pesticides are used to manage pests.	51	Pests (including invasive plants) are managed to meet production needs without the use of pesticides.
No pesticides are used because pests are not managed.	51	Pests (including Invasive plants) are not managed (no pesticides are used) so production may be reduced beyond tolerable limits.

Component 2: Nonpoint pesticide drift to surface water

Any Land Use

Each PLU will default to a not assessed status for Pesticides Transported to Surface Water – Nonpoint Pesticide Drift to Surface Water. The planner will identify this resource concern based on site-specific conditions including proximity to a surface water body. Where identified, at least 50 points of pesticide drift mitigation will be required from appropriate conservation practices and activities, such as a Pest Management Conservation System.

For cropland the highest risk crop in the rotation should be used to inform the Pesticide Use and Risk category choice and “High” is the default when Pesticide Use and Risk is unknown.

Table 96*: Cropping Risk Categories for Pesticide Loss*

Answer	Pesticide Use and Risk	Existing Condition Score Dry Climate	Existing Condition Score Humid Climate
1. Unknown	High	1	1
2. Orchards, vineyards, berries and nut crops	High	1	1
3. Vegetable Crops	High	1	1
4. Cotton	High	1	1
5. Seed crops	High	1	1
6. Flooded rice and cranberry crops	High	1	1
7. Turfgrass for sod and nursery crops	High	1	1

8. Close grown crops - residue not harvested	Moderate	10	20
9. Close grown crops – residue removed	Moderate	10	20
10. Row crops – durable residue not harvested	Moderate	10	20
11. Row crops - residue removed or fragile	Moderate	10	20
12. Christmas trees	Moderate	10	20
13. Hay crops - forage	Low	15	30

Table 97*: Pesticide Use and Risk Category (non-Cropland)*

Answer	Existing Condition Score Dry Climate	Existing Condition Score Humid Climate
Low	15	30
None	30	60

Table 98*: Integrated Pest Management – IPM System*

Note: What kind of Integrated Pest Management (IPM) System is implemented on the PLU to manage pests and pesticide environmental risk?

Answer	Existing Condition Points	Reference for Assessment Condition
Not assessed	-1	
Pest Management Conservation System (Code 595) - Full IPM System for Efficient Production and Environmental Protection	51	A full IPM System is utilized including Prevention, Avoidance, Monitoring, and Suppression to manage pests (including invasive plants) to meet production needs and manage pesticide environmental risk, including Windows Pesticide Screening Tool results for risks to water quality. If this answer is selected, do NOT select Practice code 595 on the Existing or Planned Practices pages so as not to double count points.

Full IPM System for Efficient Production	51	A full IPM System is utilized including Prevention, Avoidance, Monitoring, and Suppression to manage pests (including invasive plants) to meet production needs.
No IPM System, but pesticides are used to manage pests.	1	An IPM System is not utilized, but pesticides are applied according to label guidance to manage pests (including invasive plants) to meet production needs.
No IPM System, but pesticides are used to manage pests and spray drift is minimized.	51	An IPM system is not utilized, but pesticides are applied according to label guidance to manage pests (including invasive plants) to meet production needs, and pesticide drift is minimized with drift reducing spray technologies.
No IPM System, but pesticides are used to manage pests and the development of pest resistance is carefully managed.	1	An IPM system is not utilized, but pesticides are applied according to label guidance to manage pests (including invasive plants) to address production needs and the development of pest resistance is carefully managed.
No IPM System, but pesticides are used to manage pests, the development of pest resistance is carefully managed, and spray drift is minimized.	51	An IPM system is not utilized, but pesticides are applied according to label guidance to manage pests (including invasive plants) to address production needs, the development of pest resistance is carefully managed, and pesticide drift is minimized with drift reducing spray technologies.
No pesticides are used to manage pests.	51	Pests (including invasive plants) are managed to meet production needs without the use of pesticides.
No pesticides are used because pests are not managed.	51	Pests (including Invasive plants) are not managed (no pesticides are used) so production may be reduced beyond tolerable limits.

Pesticides Transported to Groundwater

Component: Nonpoint pesticide leaching loss

Description: Applied pesticides move below the rootzone and have the potential to be transported to groundwater sources in quantities that degrade water quality and limit its use.

Objective: Reduce hazardous nonpoint pesticide losses that can be transported to groundwater sources.

Analysis within CART:

Any Land Use

Each PLU will have the PLU soil leaching potential determined. Each soil map unit component within the PLU will be categorized into one of four WIN-PST soil leaching potentials through the Water Quality Management Services – WIN-PST Soil Leaching. This service utilizes the NRCS-published soils database (SSURGO) data according to published WIN-PST criteria. Note that soils with a dual hydrologic group due to an apparent water table in the rootzone are rated as "High". The acre weighted average rating for the PLU is then determined based on ratings for each soil map unit in the PLU.

Users will select a Pesticide Use and Risk category. For cropland the highest risk crop in the rotation should be selected for Crop Group to inform the Pesticide Use and Risk category choice, and "High" should be the default when Pesticide Use and Risk is unknown.

Table 99*: Determining Nonpoint Pesticide Leaching Loss Threshold*

Soil Vulnerability to Leaching	R Factor	
	Dry Climate: ≤50 R Factor	Humid Climate: >50 R Factor
High	30	60
Moderately High	30	60
Moderate	30	60
Low	15	30

Pesticide risk existing condition credit will come from the worst-case selection for the PLU.

Crop

For cropland the highest risk crop in the rotation should be selected for the Crop Group to inform the Pesticide Use and Risk category choice, and "High" should be the default when Pesticide Use and Risk is unknown.

Table 100*: Cropping Risk Categories for Pesticide Loss*

Answer	Pesticide Use and Risk	Existing Condition Score Dry Climate	Existing Condition Score Humid Climate
1. Unknown	High	1	1

2. Orchards, vineyards, berries and nut crops	High	1	1
3. Vegetable Crops	High	1	1
4. Cotton	High	1	1
5. Seed crops	High	1	1
6. Flooded rice and cranberry crops	High	1	1
7. Turfgrass for sod and nursery crops	High	1	1
8. Close grown crops - residue not harvested	Moderate	10	20
9. Close grown crops – residue removed	Moderate	10	20
10. Row crops – durable residue not harvested	Moderate	10	20
11. Row crops - residue removed or fragile	Moderate	10	20
12. Christmas trees	Moderate	10	20
13. Hay crops - forage	Low	15	30

Table 101*: Existing Condition - Cover/Residue/Biomass Crop Rotation Credit*

Existing Condition - Crop Rotation Credit Based on system benefits for cover/residue/biomass of all crops and cover crops in the rotation combined with the effects of harvest/grazing and tillage system. ***Note that individual credits for associated practices like crop rotation, cover crop and residue management are added to this system level credit.***	**Pesticide Leaching**
None – Rapidly Depleting Soil Organic Matter • Soil Conditioning Index is well below zero • Generally, fallow or crops with no durable residue or cover crops, with up to full field tillage.	0
Low – Depleting Soil Organic Matter • Soil Conditioning Index is moderately below zero • Generally, crops with durable residue or cover crops, or part of the rotation in high residue conserving use crops, with up to full field tillage.	5
Moderate – Maintaining Soil Organic Matter • Soil Conditioning Index is at or moderately above zero	10

• Generally, crops with durable residue or cover crops, or part of the rotation in high residue conserving use crops, with reduced tillage or no-till.	
High – Building Soil Organic Matter • Soil Conditioning Index is well above zero • Generally, high residue conserving use crops or perennial crops with full ground cover, not tilled or tilled infrequently.	15

Non-Cropland

For all land uses other than cropland, the user will select the Pesticide Use and Risk category of "low" or "none" and the existing condition credit will be conditional on the Climate R Factor.

Table 102*: Pesticide Use and Risk Category (non-Cropland)*

Pesticide Use and Risk	Existing Condition Score Dry Climate	Existing Condition Score Humid Climate
Low	15	30
None	30	60

Any Land Use

Table 103*: Integrated Pest Management – IPM System*

Note: What kind of Integrated Pest Management (IPM) System is implemented on the PLU to manage pests and pesticide environmental risk?

Answer	Existing Condition Points	Reference for Assessment Condition
Not assessed	-1	
Pest Management Conservation System (Code 595) - Full IPM System for Efficient Production and Environmental Protection	51	A full IPM System is utilized including Prevention, Avoidance, Monitoring, and Suppression to manage pests (including invasive plants) to meet production needs and manage pesticide environmental risk, including Windows Pesticide Screening Tool results for risks to water quality. If this answer is selected, do NOT select Practice code 595 on the Existing or Planned

		Practices pages so as not to double count points.
Full IPM System for Efficient Production	25	A full IPM System is utilized including Prevention, Avoidance, Monitoring, and Suppression to manage pests (including invasive plants) to meet production needs.
No IPM System, but pesticides are used to manage pests.	1	An IPM System is not utilized, but pesticides are applied according to label guidance to manage pests (including invasive plants) to meet production needs.
No IPM System, but pesticides are used to manage pests and spray drift is minimized.	1	An IPM system is not utilized, but pesticides are applied according to label guidance to manage pests (including invasive plants) to meet production needs, and pesticide drift is minimized with drift reducing spray technologies.
No IPM System, but pesticides are used to manage pests and the development of pest resistance is carefully managed.	1	An IPM system is not utilized, but pesticides are applied according to label guidance to manage pests (including invasive plants) to address production needs and the development of pest resistance is carefully managed.
No IPM System, but pesticides are used to manage pests, the development of pest resistance is carefully managed, and spray drift is minimized.	1	An IPM system is not utilized, but pesticides are applied according to label guidance to manage pests (including invasive plants) to address production needs, the development of pest resistance is carefully managed, and pesticide drift is minimized with drift reducing spray technologies.
No pesticides are used to manage pests.	51	Pests (including invasive plants) are managed to meet production needs without the use of pesticides.
No pesticides are used because pests are not managed.	51	Pests (including Invasive plants) are not managed (no pesticides are used) so

		production may be reduced beyond tolerable limits.

Pathogens and Chemicals from Manure, Biosolids, or Compost Applications Transported to Surface Water

Component: Nonpoint pathogen surface loss

Description: Pathogens, pharmaceuticals, and chemicals from land applied manure, biosolids or compost are transported to surface waters in quantities that degrade water quality and limit its use.

Objective: Reduce nonpoint pathogen, pharmaceutical, and chemical transport beyond the edge of the field from land applied manure, biosolids or compost, by requiring a level of conservation management that is appropriate for each site's potential for nonpoint pathogen, pharmaceutical and chemical loss.

Analysis within CART:

Crop, Pasture

Each PLU will default to a not assessed status for Nonpoint Pathogen Surface Loss. The planner will identify this resource concern based on site specific conditions. A threshold value of 50 will be set and the existing condition question will be triggered. The existing condition question will set the existing score as seen in Table 104. The planner will identify this resource concern based on the application of manure, biosolids or compost, or the presence of domestic livestock on the PLU. Where identified, at least 50 points of mitigation will be required from appropriate conservation practices and activities, including Nutrient Management that utilizes application timing to avoid high runoff periods, incorporation to reduce runoff potential, and application setbacks to protect nearby surface water bodies, waste treatment practices that destroy potentially harmful pathogens, and Prescribed Grazing and other practices that can help manage livestock waste.

Table 104*: Manure, compost or biosolid application*

Answer	Existing Condition Points
Not assessed	-1
Not applicable	60
Left on the surface without incorporation	0
Injected or incorporated into the soil soon after application	51

Pathogens and Chemicals from Manure, Biosolids, or Compost Applications Transferred to Groundwater

Component: Nonpoint pathogen loss to groundwater

Description: Pathogens, pharmaceuticals, and chemicals from land applied manure, biosolids or compost are transported to groundwater in quantities that degrade water quality and limit its uses.

Objective: Reduce transport of pathogens, pharmaceuticals, leachate and polluting chemicals from manure, bio-solids, or compost to groundwater.

Analysis within CART:

Crop, Pasture

Each PLU will default to a not assessed status for Nonpoint pathogen loss to groundwater. The planner will identify this resource concern based on site specific conditions. A threshold value of 50 will be set and the existing condition question will be triggered. The existing condition question will set the existing score as seen in Table 105. The planner will identify this resource concern based on the application of manure, biosolids or compost, or the presence of domestic livestock on the PLU. Where identified, at least 50 points of mitigation will be required from appropriate conservation practices and activities, including Nutrient Management that utilizes application timing to avoid high water table periods, waste treatment practices that destroy potentially harmful pathogens, and Prescribed Grazing and other practices that can help manage livestock waste.

Table 105*: Manure, compost or biosolid application*

Answer	Existing Condition Points
Not assessed	-1
Not applicable	60
Left on the surface without incorporation	0
Injected or incorporated into the soil soon after application	51

Salts Transported to Surface Water

Component: Salt loss to surface water

Description: Irrigation or rainfall runoff transports salts to receiving surface waters in quantities that degrade water quality and limit use for intended purposes.

Objective: Limit transfer of salts from PLU to receiving surface waters.

Analysis within CART:

Any Land Use

Each PLU will default to a not assessed status for Salt Loss to Surface Water. The planner will identify this resource concern based on site-specific conditions such as being in a known salinity project area. Where identified, at least 50 points of salinity mitigation will be required from appropriate conservation practices and activities, including irrigation water management and irrigation tailwater recovery.

Table 106*: Salt Loss to Surface Water*

Answer	Existing Condition Points
Not assessed	-1
Not applicable	60
Yes - Is a concern but is NOT currently being managed	0
Yes - Is a concern and is being managed with irrigation water management and tail water recovery	51

Salts Transported to Groundwater

Component: Salt loss to groundwater

Description: Irrigation or rainfall runoff transport salts to groundwater in quantities that degrade aquifer water quality and limit intended uses.

Objective: Limit loss of salts from PLU to groundwater.

Analysis within CART:

Any Land Use

Each PLU will default to a not assessed status for salts – groundwater. The planner will identify this resource concern based on site-specific conditions such as being in a known salinity project area. Where identified, at least 50 points of salinity mitigation will be required from appropriate conservation practices and activities, including irrigation water management.

Table 107*: Salt Loss to Groundwater*

Answer	Existing Condition Points
Not assessed - Is UNKNOWN if it is a concern	-1
Not applicable	60
Yes - Is a concern but is NOT currently being managed	0
Yes - Is a concern but is being managed with the irrigation water management system	51

Petroleum, Heavy Metals, and Other pollutants Transported to Surface Water

Component 1: Concentrated agrichemical runoff loss and storage and handling of fertilizer and pesticides

Description: Agrichemical products (fertilizers and pesticides) are stored, mixed, loaded, or handled onsite, so they have the potential to contaminant surface waters.

Objective: Control accidental release of stored agrichemical products to prevent contamination of surface waters.

Analysis within CART:

Any Land Use

Each PLU will default to a "not assessed" status for agrichemical products. The planner will identify this resource concern based on site-specific conditions. A planning threshold value of 50 will be set and the existing condition question will be triggered. The existing condition question will set the existing score as seen in Table 108.

Table 108*: Agrichemical Product Storage (Pesticides and Fertilizers)*

Note: Are agrichemical products stored, mixed, loaded, or handled on the PLU?

Answer	Existing Condition Points
Not assessed	-1
Not applicable	60
Yes - ARE stored, mixed, loaded, or handled on PLU AND secondary containment is NOT in place	0
Yes - ARE stored, mixed, loaded, or handled on PLU AND secondary containment IS in place	51

Component 2: Petroleum and other pollutant containment to surface water

Description: Petroleum products are stored and handled on site without secondary containment, so the potential exists to contaminate surface waters. As well, heavy metals or other pollutants are present on the PLU from mining operations or other activities including storage and handling. Materials containing these pollutant types are present, stored or handled on site, so they have the potential to contaminate surface waters. The planner will identify this resource concern based on site-specific conditions.

Objective: Control accidental release of stored petroleum products and other pollutants to prevent contamination of surface waters.

Analysis within CART:

Any Land Use

Each PLU will default to a "not assessed" status for petroleum storage or other pollutants present. The planner will identify this resource concern based on site-specific conditions. A planning threshold value of 50 will be set and the existing condition question will be triggered. The existing condition question will set the existing score as seen in Table 109.

Table 109*: Petroleum products stored and handled on the PLU*

Answer	Existing Condition Points
Not assessed - ARE stored and handled on the PLU, but it is UNKNOWN if secondary containment is in place.	-1
Not applicable	60
Yes - ARE stored and handled on the PLU, but secondary containment is **NOT** in place.	0
Yes - ARE stored and handled on the PLU and secondary containment IS in place that meets the minimum assessment threshold.	51

Component 3: Mine waste remediation and containment - surface water

Description: Mining operations on the PLU have the potential to contaminate surface waters, including heavy metals or other mining effluent pollutants. Mine waste and materials containing pollutants are present, generated, released, stored or handled on site, so they have the potential to contaminate surface waters. The planner will identify this resource concern based on site-specific conditions.

Objective: Control release of mine waste and materials containing pollutants to prevent contamination of surface waters.

Analysis within CART:

Any Land Use

Each PLU will default to a "not assessed" status for mine waste or other mining effluent pollutants present. The planner will identify this resource concern based on site-specific conditions. A planning threshold value of 50 will be set and the existing condition question (Yes/No) will be triggered. The existing condition question will set the existing score as seen in Table 110.

Table 110*: Mine Waste Pollutants Present on the PLU*

Answer	Existing Condition Points
Not assessed - present on the PLU but is UNKNOWN if adequate control or treatment is in place	-1
Not applicable	60
Yes - present on the PLU, and adequate control or treatment is NOT in place	0
Yes - present on the PLU, but adequate control or treatment **IS** in place	51

Petroleum, Heavy Metals, and Other Pollutants Transported to Groundwater

Component 1: Concentrated agrichemical leaching loss and storage and handling of fertilizer and pesticides

Description: Agrichemical products (fertilizers and pesticides) are stored, mixed, loaded, or handled onsite, so they have the potential to contaminant groundwater.

Objective: Control accidental release of stored agrichemical products to prevent contamination of groundwater.

Analysis within CART:

Any Land Use

Each PLU will default to a "not assessed" status. The planner will identify this resource concern based on site-specific conditions. A planning threshold value of 50 will be set and the existing condition question will be triggered. The existing condition question will set the existing score as seen in Table 111.

Table 111*: Agrichemical Product Storage (Pesticides and Fertilizers)*

Note: Are agrichemical products stored, mixed, loaded, or handled on the PLU?

Answer	Existing Condition Points
Not assessed	-1
Not applicable	60
Yes - ARE stored, mixed, loaded, or handled on PLU AND secondary containment is NOT in place	0
Yes - ARE stored, mixed, loaded, or handled on PLU AND secondary containment IS in place	51

Component 2: Petroleum and other pollutant containment to groundwater

Description: Petroleum products are stored and handled on site without secondary containment, so the potential exists to contaminate groundwater. As well, other pollutants are present on the PLU from other activities including storage and handling. Materials containing these pollutant types are present, stored or handled on site, so they have the potential to contaminate groundwater. The planner will identify this resource concern based on site-specific conditions.

Objective: Control accidental release of stored petroleum products and other pollutants to prevent contamination of groundwaters.

Analysis within CART:

Any Land Use

Each PLU will default to a "not assessed" status for petroleum storage or other pollutants present. The planner will identify this resource concern based on site-specific conditions. A planning threshold value of 50 will be set and the existing condition question (Yes/No) will be triggered. The existing condition question will set the existing score as seen in Table 112 below.

Table 112*:* Petroleum products stored on the PLU

Answer	Existing Condition Points
Not assessed - ARE stored and handled on the PLU, but it is UNKNOWN if secondary containment is in place.	-1
Not applicable	60
Yes - ARE stored and handled on the PLU, but secondary containment is **NOT** in place.	0
Yes - ARE stored and handled on the PLU and secondary containment IS in place that meets the minimum assessment threshold.	51

Component 3: Mine waste remediation and containment - groundwater

Description: Mining operations on the PLU have the potential to contaminate surface waters, including heavy metals or other mining effluent pollutants. Mine waste and materials containing pollutants are present, generated, released, stored or handled on site, so they have the potential to contaminate groundwater. The planner will identify this resource concern based on site-specific conditions.

Objective: Control release of mine waste and materials containing pollutants to prevent contamination of groundwater.

Analysis within CART:

Any Land Use

Each PLU will default to a "not assessed" status for mine waste or other mining effluent pollutants present. The planner will identify this resource concern based on site-specific conditions. A planning threshold value of 50 will be set and the existing condition question (Yes/No) will be triggered. The existing condition question will set the existing score as seen in Table 113 below.

Table 113*: Mine Waste Pollutants Present on the PLU*

Answer	Existing Condition Points
Not assessed - present on the PLU but is UNKNOWN if adequate control or treatment is in place	-1
Not applicable	60
Yes - present on the PLU, and adequate control or treatment is NOT in place	0
Yes - present on the PLU, but adequate control or treatment **IS** in place	51

Sediment Transported to Surface Water

Component: Sediment from erosion sources

Description: Offsite transport of sediment to surface waters degrades water quality and limits use for intended purposes.

Objective: Limit sediment loss from site to surface waters.

Analysis within CART:

Crop

For sediment from sheet and rill erosion on cropland, each PLU will have the PLU soil runoff potential determined. Each soil map unit within the PLU will be categorized into one of four soil runoff potentials through the Water Quality Management Services - Soil Runoff, based on its published map unit components corresponding to the charts in Table 114, Table 115, and Table 116. The acre weighted average rating for the PLU is then determined based on ratings for each soil map unit in the PLU.

Table 114*: Soil Runoff Potential: Drained/No High Water Table*

Soil Runoff Potential	A	B	C	D

Low =0	ALL	Slope < 4	Slope < 2	Slope < 2 AND kfactor < 0.28
Moderate =1	-	Slope >= 4 AND Slope <= 6 AND kfactor < 0.32	Slope >= 2 AND slope <= 6 AND kfactor < 0.28	Slope < 2 AND kfactor >= 0.28
Moderately High =2	-	Slope>= 4 AND slope <= 6 AND kfactor >= 0.32	slope>= 2 AND slope <= 6 AND kfactor >= 0.28	(slope>= 2 AND slope <= 4)
High =3	-	Slope > 6	Slope > 6	Slope > 4

Table 115*: Soil Runoff Potential: If High Water Table Kind is Perched or Apparent and High Water Table is <= 61 cm AND Not Drained*

Soil Runoff Potential	A	B	C	D
Low =0	-	-	-	-
Moderate =1	-	-	-	-
Moderately High =2	-	-	-	-
High =3	All	All	All	All

Table 116*: Soil Runoff Potential: Dual hydrologic soil groups A/D, BD, C/D that are not drained*

Soil Runoff Potential	A/D	B/D	C/D
Low =0	-	-	-
Moderate =1	-	-	-
Moderately High =2	-	-	-
High =3	All	All	All

Using the R factor from R factor service, the PLU soil runoff potential is used to determine the threshold of conservation management points necessary to meet the assessment threshold, as seen in Table 117.

Table 117*: Determining Sediment Transport Threshold*

Runoff Vulnerability	R Factor			
	≤50	>50-150	>150-250	>250
High	5	50	85	100
Moderately High	5	30	50	85

Moderate	1	15	40	50
Low	1	1	25	40

The existing condition question will set the existing score for Cropland as seen in Table 118.

Table 118*: Existing Rotation Residue Value*

Existing Condition - Crop Rotation Credit Based on system benefits for cover/residue/biomass of all crops and cover crops in the rotation combined with the effects of harvest/grazing and tillage system. ***Note that individual credits for associated practices like crop rotation, cover crop and residue management are added to this system level credit.***	Sediment from Erosion Credit
None – Rapidly Depleting Soil Organic Matter • Soil Conditioning Index is well below zero • Generally, fallow or crops with no durable residue or cover crops, with up to full field tillage.	0
Low – Depleting Soil Organic Matter • Soil Conditioning Index is moderately below zero • Generally, crops with durable residue or cover crops, or part of the rotation in high residue conserving use crops, with up to full field tillage.	10
Moderate – Maintaining Soil Organic Matter • Soil Conditioning Index is at or moderately above zero • Generally, crops with durable residue or cover crops, or part of the rotation in high residue conserving use crops, with reduced tillage or no-till.	20
High – Building Soil Organic Matter • Soil Conditioning Index is well above zero • Generally, high residue conserving use crops or perennial crops with full ground cover, not tilled or tilled infrequently.	40

This Resource Concern is evaluated on Cropland with variable thresholds based on soils and R factor and mitigated with the Existing Condition question for SCI Crop Rotation and selected practices.

All other applicable land uses:

Below are the same existing condition questions and points used in the Sheet and rill erosion component to evaluate Sediment from erosion sources on non-cropland.

Range

For Range land uses, a standard threshold of 50 is set. This component will be addressed by answering the Interpreting Indicators of Rangeland Health (IIRH) question in Table 119.

Table 119: *Rangeland Health - Soil/Site Stability Limitations*

Answer	Existing Condition Points	Reference for Existing Condition
Not assessed	-1	
None to Slight	60	Interpreting Indicators of Rangeland Health, version 5
Slight to Moderate	51	Interpreting Indicators of Rangeland Health, version 5
Moderate	30	Interpreting Indicators of Rangeland Health, version 5
Moderate to Extreme	15	Interpreting Indicators of Rangeland Health, version 5
Extreme to Total	1	Interpreting Indicators of Rangeland Health, version 5

Pasture

For Pasture land uses, a standard threshold of 50 is set. This component will be addressed by answering the Pasture Condition Score Sheet (PCS) existing condition questions in Table 120, Table 121, and Table 122.

Table 120: *Pasture Condition Score Sheet - Plant Vigor*

Answer	Existing Condition Points	Reference for Existing Condition
Not assessed	-1	
High	20	• Rapid recovery of desirable forage. All healthy green forage. • Pasture Condition Score element score = 5
Good	17	• Good recovery of desirable forage. Light green and dark green forage present. • Pasture Condition Score element score = 4

Fair	10	• Adequate recovery of desirable forage. Yellowish and dark green areas due to manure and urine patches. • Pasture Condition Score element score = 3
Low	5	• Some recovery. Yellowish green forage, or moderately or sight stunting of desirable forage. • Pasture Condition Score element score = 2
Poor	1	• No plant recovery after grazing/harvest. Pale, yellow or brown, or severe stunting of desirable forage. • Pasture Condition Score element score = 1

Table 121: *Pasture Condition Score Sheet– Live or Dormant Plant Cover*

Answer	Existing Condition Points	Reference for Existing Condition
Not assessed	-1	
High	20	• More than 95% live (non-dormant) leaf canopy. Remaining is either dead standing material, or bare ground. • Pasture Condition Score element score = 5
Good	17	• 81-95% live leaf canopy. Remaining is either dead standing material, or bare ground. • Pasture Condition Score element score = 4
Fair	10	• 66-80% live leaf canopy. Remaining is either dead standing material, or bare ground. • Pasture Condition Score element score = 3
Low	5	• 40-65% is live leaf canopy Remaining is either dead standing material, or bare ground. • Pasture Condition Score element score = 2
Poor	1	• Less than 40% is live leaf canopy. Remaining is either dead standing material, or bare ground. • Pasture Condition Score element score = 1

Table 122: *Pasture Condition Score Sheet – Erosion*

Answer	Existing Condition Points	Reference for Existing Condition
Not assessed	-1	
High	20	• Sheet and Rill: Plant density high, no runoff, good infiltration. No evidence of present or past erosion. • Pasture Condition Score element score = 5
Good	17	• Sheet and Rill: Plant density high, runoff low, good infiltration. May have evidence of past erosion if present. • Pasture Condition Score element score = 4
Fair	10	• Sheet and Rill: Plant density good and runoff moderate. If present, erosion concentrated on heavily used areas. • Pasture Condition Score element score = 3
Low	5	• Sheet and Rill: Plant density slows runoff. Erosion present and easily seen on steeper terrain. • Pasture Condition Score element score = 2
Poor	1	• Sheet and Rill: Plant density is insufficient to stop runoff and poor infiltration. Erosion easily visible throughout pasture. • Pasture Condition Score element score = 1

Forest, Farmstead, Associated Agriculture Land, Other Rural Land

If the Resource concern component is applicable the planner will identify this resource concern based on site-specific conditions. A threshold value of 50 will be set and the existing condition question will be triggered. The existing condition question will set the existing score as seen in Table 123.

Table 123: *Sheet and Rill Erosion Existing Condition*

Answer	Existing Condition Points
Not assessed	-1
Not applicable	0
Site is stable and without visible signs of active erosion.	51

Site is NOT stable and has visible signs of active erosion.	1

Air

Emissions of Particulate Matter (PM) and PM Precursors

Component 1: PM – Diesel engines

Description: Direct emissions of particulate matter (PM) - dust and smoke - as well as the formation of fine particulate matter in the atmosphere from other agricultural emissions - ammonia, nitrogen oxides (NOx), and volatile organic compounds (VOCs) - can cause multiple negative environmental impacts.

Objective: Emissions of PM and PM precursors from diesel engines do not excessively contribute to negative impacts to human, plant, or animal health and do not excessively contribute to regional visibility degradation.

Analysis within CART:

Crop, Forest, Range, Pasture, Farmstead, Associated Agriculture Land

A threshold value of 50 will be set, and the combustion sources existing condition question will be triggered for diesel engines.

Each PLU will trigger an intersection with the PM2.5 and PM10 nonattainment geospatial data.

If there are no diesel engines in operation at the PLU, this component is not applicable. Otherwise, the existing condition question will set the existing condition score as seen in Table 124.

Table 124*: Diesel Engine Combustion Sources Existing Condition*

Note: If yes, document all diesel engines larger than 25 brake horsepower, including engine horsepower rating, model year, and annual hours of usage.

Answer	Existing Condition Points	Reference for Assessment Condition
Not assessed	-1	
Not applicable	0	
Low risk combustion sources	81	All diesel engines larger than 25 brake horsepower in operation at the PLU are certified to EPA Tier 4 final standards (based on engine model year and horsepower rating).

Low-medium risk combustion sources	74	**For PM attainment areas:** All diesel engines larger than 25 brake horsepower in operation at the PLU are certified to at least EPA Tier 3 standards (based on engine model year and horsepower rating). **For PM nonattainment areas:** All diesel engines larger than 25 brake horsepower in operation at the PLU are certified to at least EPA Tier 4 interim standards (based on engine model year and horsepower rating).
Medium risk combustion sources	51	**For PM attainment areas:** At least 75% of the normal annual horsepower-hours for diesel engines larger than 25 brake horsepower in operation at the PLU are from engines that are certified to at least EPA Tier 3 standards (based on engine model year and horsepower rating). **For PM nonattainment areas:** All diesel engines larger than 25 brake horsepower in operation at the PLU are certified to at least EPA Tier 3 standards (based on engine model year and horsepower rating).
High-medium risk combustion sources	26	**For PM attainment areas:** At least 50% of the normal annual horsepower-hours for diesel engines larger than 25 brake horsepower in operation at the PLU are from engines that are certified to at least EPA Tier 3 standards (based on engine model year and horsepower rating). **For PM nonattainment areas:** At least 75% of the normal annual horsepower-hours for diesel engines larger than 25 brake horsepower in operation at the PLU are from engines that are certified to at least EPA Tier 3 standards (based on engine model year and horsepower rating).
High risk combustion sources	1	**For PM attainment areas:** Less than 50% of the normal annual horsepower-hours for diesel engines larger than 25 brake horsepower in operation at the PLU are from engines that are certified to at

		least EPA Tier 3 standards (based on engine model year and horsepower rating). **For PM nonattainment areas:** Less than 75% of the normal annual horsepower-hours for diesel engines larger than 25 brake horsepower in operation at the PLU are from engines that are certified to at least EPA Tier 3 standards (based on engine model year and horsepower rating).

Component 2: PM – non-engine combustion equipment

Description: Emissions of PM and PM precursors from non-engine combustion equipment do not excessively contribute to negative impacts to human, plant, or animal health and do not excessively contribute to regional visibility degradation.

Analysis within CART:

Crop, Forest, Range, Pasture, Farmstead, Associated Agriculture Land

A threshold value of 50 will be set. If there are no non-engine combustion sources in operation at the PLU, this component is not applicable.

Each PLU will trigger an intersection with the PM2.5 and PM10 nonattainment geospatial data.

The existing condition question will set the existing condition score as seen in Table 125.

Table 125*: Non-Engine Combustion Sources Existing Condition*

Answer	Existing Condition Points	Reference for Assessment Condition
Not assessed	-1	
Not applicable	0	
Low risk combustion sources	81	All non-engine combustion sources utilize natural gas or propane as fuel and/or employ additional emissions control for PM and NOx emissions.
Medium risk combustion sources	51	**For PM attainment areas:** At least 50% of the normal annual fuel usage for non-engine combustion sources in operation at the PLU is either natural gas or propane, or at least 50% of the non-engine combustion sources in operation at the

		PLU utilize emissions control for PM and NOx emissions. **For PM nonattainment areas:** At least 75% of the normal annual fuel usage for non-engine combustion sources in operation at the PLU is either natural gas or propane, or at least 75% of the non-engine combustion sources in operation at the PLU utilize emissions control for PM and NOx emissions.
High risk combustion sources	1	**For PM attainment areas:** Less than 50% of the normal annual fuel usage for non-engine combustion sources in operation at the PLU is either natural gas or propane, and/or less than 50% of the non-engine combustion sources in operation at the PLU utilize emissions control for PM and NOx emissions. **For PM nonattainment areas:** Less than 75% of the normal annual fuel usage for non-engine combustion sources in operation at the PLU is either natural gas or propane, and/or less than 75% of the non-engine combustion sources in operation at the PLU utilize emissions control for PM and NOx emissions.

Component 3: PM – open burning

Description: Emissions of PM and PM precursors from fire do not excessively contribute to negative impacts to human, plant, or animal health and do not result in safety or nuisance visibility restrictions.

Analysis within CART:

Crop, Forest, Range, Pasture, Farmstead, Associated Agriculture Land

Each PLU will default to a not assessed status for this component. A threshold value of 50 will be set, and the existing condition question will set the existing condition score as seen in Table 126*: Are you using fire for management?*.

Table 126*: Are you using fire for management?*

Answer	Existing Condition Points

Not assessed	-1
Not applicable	0
Yes - basic smoke management practices are implemented	51
Yes - basic smoke management practices are NOT implemented	1

If fire is not applied at the PLU, this component is not applicable.

If less than 100% of all fire events at the PLU are conducted using Basic Smoke Management Practices, apply Prescribed Burning (338) to develop, implement, and follow a prescribed burn plan that includes Basic Smoke Management Practices for all fire events. Additional practices may be necessary to support Prescribed Burning (338).

Component 4: PM – pesticide drift

Description: Pesticide use does not result in unwanted chemical droplet drift.

Analysis within CART:

Crop, Forest, Range, Pasture, Farmstead, Associated Agriculture Land

Each PLU will default to a not assessed status for this component. The Planner may identify a Particulate Matter resource concern for this component based on site specific conditions. A threshold value will be set at 50.

If there is no chemical pesticide application at the PLU, this component is not applicable. Otherwise, the existing condition questions will set the existing condition score.

Table 127*: Integrated Pest Management – IPM System*

Note: What kind of Integrated Pest Management (IPM) System is implemented on the PLU to manage pests and pesticide environmental risk?

Answer	Existing Condition Points	Reference for Assessment Condition
Not assessed	-1	
Pest Management Conservation System (Code 595) - Full IPM System for Efficient Production and Environmental Protection	51	A full IPM System is utilized including Prevention, Avoidance, Monitoring, and Suppression to manage pests (including invasive plants) to meet production needs and manage pesticide environmental risk, including Windows Pesticide Screening Tool results for risks to water quality. If this answer is selected, do NOT select Practice

		code 595 on the Existing or Planned Practices pages so as not to double count points.
Full IPM System for Efficient Production	51	A full IPM System is utilized including Prevention, Avoidance, Monitoring, and Suppression to manage pests (including invasive plants) to meet production needs.
No IPM System, but pesticides are used to manage pests.	1	An IPM System is not utilized, but pesticides are applied according to label guidance to manage pests (including invasive plants) to meet production needs.
No IPM System, but pesticides are used to manage pests and spray drift is minimized.	51	An IPM system is not utilized, but pesticides are applied according to label guidance to manage pests (including invasive plants) to meet production needs, and pesticide drift is minimized with drift reducing spray technologies.
No IPM System, but pesticides are used to manage pests and the development of pest resistance is carefully managed.	1	An IPM system is not utilized, but pesticides are applied according to label guidance to manage pests (including invasive plants) to address production needs and the development of pest resistance is carefully managed.
No IPM System, but pesticides are used to manage pests, the development of pest resistance is carefully managed, and spray drift is minimized.	51	An IPM system is not utilized, but pesticides are applied according to label guidance to manage pests (including invasive plants) to address production needs, the development of pest resistance is carefully managed, and pesticide drift is minimized with drift reducing spray technologies.
No pesticides are used to manage pests.	51	Pests (including invasive plants) are managed to meet production needs without the use of pesticides.

No pesticides are used because pests are not managed.	51	Pests (including Invasive plants) are not managed (no pesticides are used) so production may be reduced beyond tolerable limits.

Component 5: PM – nitrogen fertilizer

Description: Emissions of ammonia (a PM precursor) from nitrogen fertilizer application do not excessively contribute to negative impacts to human, plant, or animal health and do not excessively contribute to regional visibility degradation.

Analysis within CART:

Crop, Forest, Pasture, Associated Agriculture Land

Each PLU will default to a not assessed status for this component. The Planner may identify a Particulate Matter resource concern for this component based on site specific conditions. A threshold value will be set at 50.

The existing condition question will set the existing condition score as seen in Table 128.

Table 128*: Existing Condition – Nutrient Application*

Answer	Existing Condition Points	Reference for Assessment Condition
Not assessed	-1	Unknown if nutrients are applied.
No nutrients applied	51	No organic or inorganic nutrients are applied mechanically or by hand. Note that this does not include nutrients deposited by grazing animals when these are the only nutrients applied to the PLU.
Nutrients are applied	1	Organic or inorganic nutrients are applied to the PLU mechanically or by hand.

If there is no NRCS-approved nutrient management plan that specifically addresses nitrogen for the PLU, apply Nutrient Management (590) to develop such a plan.

Component 6: PM – dust from field operations

Description: Mechanically-generated emissions of PM from field operations (including tillage, seed bed preparation, planting, harvest operations, or any combination of these) do not excessively contribute to negative impacts to human, plant, or animal health; do not excessively contribute to unwanted deposition on surfaces; and do not result in safety or nuisance visibility restrictions.

Analysis within CART:

Crop, Pasture

Each PLU will default to a not assessed status for this component. The Planner may identify a Particulate Matter resource concern for this component based on site specific conditions. A threshold value will be set at 50.

If field operations are not conducted at the PLU, this component is not applicable. Otherwise, the existing condition questions will set the existing condition score as seen in Table 129.

Table 129*: Dust from Field Operations*

Note: Has the client or planner observed any PM/dust issues related to field operations at the PLU, and have any practices or techniques been previously applied to address the observed PM/dust issues?

Answer	Existing Condition Points	Reference for Assessment Condition
Not assessed	-1	
Not applicable	0	
Minimal potential for dust	51	Neither the Planner or client has observed any PM/dust issues related to field operations at the PLU OR The client has previously applied practices or techniques to address previous PM/dust observed issues, and the applied practices or techniques have been documented.
Significant potential for dust	1	The client has not previously applied practices or techniques to address observed PM/dust issues.

If there have been previous PM/dust issues from field operations, and practices have not been previously applied, Conservation Practices and Activities can be applied.

Component 7: PM – dust from unpaved roads

Description: Emissions of PM from vehicle and machinery travel on unpaved roads and surfaces do not excessively contribute to negative impacts to human, plant, or animal health; do not excessively contribute to unwanted deposition on surfaces; and do not result in safety or nuisance visibility restrictions.

Analysis within CART:

Crop, Forest, Range, Pasture, Farmstead, Associated Agriculture Land

Each PLU will default to a not assessed status for this component. The Planner may identify a Particulate Matter resource concern for this component based on site specific conditions. A threshold value will be set at 50.

If there are no unpaved roads or other unpaved travel surfaces used for vehicle or machinery movement at the PLU, this component is not applicable. Otherwise, the existing condition questions will set the existing condition score as seen in Table 130.

Table 130*: Dust from Unpaved Roads*

Note: Has the client or planner observed any PM/dust issues related to vehicle travel on unpaved roads and surfaces at the PLU, and have any practices or techniques been previously applied to address the observed PM/dust issues?

Answer	Existing Condition Points	Reference for Assessment Condition
Not Assessed	-1	
Not Applicable	0	
Minimal potential for dust	51	Neither the Planner or client has observed any PM/dust issues related to vehicle travel on unpaved roads at the PLU OR The client has previously applied practices or techniques to address previous PM/dust observed issues, and the applied practices or techniques have been documented.
Significant potential for dust	1	The client has not previously applied practices or techniques to address observed PM/dust issues.

Component 8: PM – windblown dust

Description: Wind-generated emissions of PM do not excessively contribute to negative impacts to human, plant, or animal health; do not excessively contribute to unwanted deposition on surfaces; and do not result in safety or nuisance visibility restrictions.

Analysis within CART:

Crop, Forest, Range, Pasture, Farmstead, Associated Agriculture Land

Each PLU will default to a not assessed status for this component. The Planner may identify a Particulate Matter resource concern for this component based on site specific conditions. A threshold value will be

set at 50. The wind erosion existing condition question will be triggered and used to answer this component.

Table 131*: Windblown Dust*

Note: Has the client or planner observed any windblown PM/dust issues at the PLU, and have any practices or techniques been previously applied to address the observed PM/dust issues?

Answer	Existing Condition Points	Reference for Assessment Condition
Not Assessed	-1	
Not Applicable	0	
Minimal potential for dust	51	Neither the Planner or client has observed any windblown PM/dust issues at the PLU OR The client has previously applied practices or techniques to address previous PM/dust observed issues, and the applied practices or techniques have been documented.
Significant potential for dust	1	The client has not previously applied practices or techniques to address observed PM/dust issues.

Component 9: PM – confined animal activities

Description: Emissions of PM and PM precursors from confinement-based animal production do not excessively contribute to negative impacts to human, plant, or animal health; do not excessively contribute to regional visibility degradation; and do not result in safety or nuisance visibility restrictions.

Analysis within CART:

Farmstead

Each PLU will default to a not assessed status for this component. The Planner may identify a Particulate Matter resource concern for this component based on site specific conditions. A threshold value will be set at 50.

If there are no livestock present on the PLU, this component is not applicable. Otherwise, the existing condition questions will set the existing condition score as seen in Table 132.

Table 132*: Dust from Confinement-Based Animal Operations*

Note: Has the client or planner observed any PM/dust issues related to confinement-based animal production at the PLU, and have any practices or techniques been previously applied to address the observed PM/dust issues?

Answer	Existing Condition Points	Reference for Assessment Condition
Not Assessed	-1	
Not Applicable	0	
Minimal potential for dust	51	Neither the Planner or client has observed any PM/dust issues related to confinement-based animal production at the PLU OR The client has previously applied practices or techniques to address previous PM/dust observed issues, and the applied practices or techniques have been documented.
Significant potential for dust	1	The client has not previously applied practices or techniques to address observed PM/dust issues.

Emissions of Greenhouse Gases (GHGs)

Component 1: GHGs – nitrogen fertilizer

Description: Emissions of greenhouse gases from agricultural operations increase atmospheric concentrations of these gases.

Objective: Emissions of nitrous oxide from nitrogen fertilizer application do not excessively contribute to increased atmospheric concentrations of greenhouse gases.

Analysis within CART:

Crop, Forest, Pasture, Associated Agriculture Land

Each PLU will default to a not assessed status for this component. The Planner may identify a Greenhouse Gas resource concern for this component based on site specific conditions. A threshold value will be set at 50.

The existing condition question will set the existing condition score as see in Table 133.

Table 133*: Existing Condition – Nutrient Application*

Answer	Existing Condition Points	Reference for Assessment Condition

Not assessed	-1	Unknown if nutrients are applied.
No nutrients applied	51	No organic or inorganic nutrients are applied mechanically or by hand. Note that this does not include nutrients deposited by grazing animals when these are the only nutrients applied to the PLU.
Nutrients are applied	1	Organic or inorganic nutrients are applied to the PLU mechanically or by hand.

If there is no NRCS-approved nutrient management plan that specifically addresses nitrogen for the PLU, apply Nutrient Management (590) to develop such a plan.

Component 2: GHGs – carbon stock

Description: Maintain or increase total carbon stored in soils and/or perennial biomass to reduce atmospheric concentrations of carbon dioxide and enhance carbon sequestration.

Analysis within CART:

Crop, Forest, Pasture, Range, Associated Agriculture Land

Each PLU will default to a not assessed status for this component. The Planner may identify a Greenhouse Gas resource concern for this component based on site specific conditions. A threshold value will be set at 50 and the following existing condition questions will be triggered.

In the future, soil organic carbon stock will be identified by geospatial data (see https://jneme910.github.io/CART/chapters/Soil_Organic_Carbon_Stock).

Table 134*: Strategy exists for maintaining or increasing carbon stocks*

Note: (in soils and perennial biomass being implemented at the PLU)

Answer	Existing Condition Points
Not Assessed	-1
Not Applicable	0
No – carbon stocks stable/increasing	51
No – carbon stocks decreasing	1
Yes – carbon stocks stable/increasing	51
Yes – carbon stocks decreasing	1

If the client is not implementing a strategy for maintaining or increasing carbon stocks in soils and perennial biomass at the PLU, the Planner will make a determination of whether or not a resource

concern exists for this Component for carbon stocks. The resource concern determination for carbon stocks will include an analysis of the PLU using COMET-Farm to analyze overall carbon stocks in soils and perennial biomass at the PLU. If the analysis shows that overall carbon stocks in soils and perennial biomass are stable or increasing, an existing score of 51 will be applied. If the analysis shows that overall carbon stocks in soils and perennial biomass are decreasing, an existing score of 1 will be applied. Conservation Practices and Activities related to maintaining or increasing carbon stocks in soils and perennial biomass are determined based on an alternative scenario analysis of the PLU using COMET-Farm and are added to the existing condition to determine the state of the planned management system.

Component 3: GHGs – hydric & organic soils

Description: Maintain or increase total carbon stored in soils and/or perennial biomass to reduce atmospheric concentrations of carbon dioxide and enhance carbon sequestration.

Analysis within CART:

Crop, Forest, Pasture, Range, Associated Agriculture Land

Each PLU will default to a not assessed status for this component. The Planner may identify a Greenhouse Gas resource concern for this component based on site specific conditions. A threshold value will be set at 50 and the following existing condition questions will be triggered:

Table 135*: Hydric or organic soils at the PLU*

Answer	Existing Condition Score	Reference for Assessment Condition
Not assessed	-1	
Not applicable	0	
All undrained hydric and organic soils with perennial cover	51	All undrained hydric and organic soils at the PLU are maintained with perennial cover
< 100% of undrained hydric and organic soils with perennial cover	1	< 100% of undrained hydric and organic soil acreage is maintained with perennial cover

If less than 100% of undrained hydric and organic soils at the PLU are maintained with perennial cover, apply Conservation Cover (327) to ensure that 100% of undrained hydric and organic soils at the PLU are maintained with perennial cover. Additional practices may be necessary to support Conservation Cover (327).

Component 4: GHGs – confined animal activities

Description: Emissions of methane and nitrous oxide from confinement-based livestock production do not excessively contribute to increased atmospheric concentrations of greenhouse gases.

Analysis within CART:

Farmstead

Each PLU will default to a not assessed status for this component. The Planner may identify a Greenhouse Gas resource concern for this component based on site specific conditions. A threshold value will be set at 50.

If there is no confinement-based livestock production at the PLU, this component is not applicable. Otherwise, the existing condition questions will set the existing condition score as seen in Table 136 and Table 137.

Table 136: *Manures, Biosolids, Compost, or Other Soil Amendment and Pathogen Sources*

Note: Are they stockpiled or stored on the PLU?

Answer	Existing Condition Points
Not applicable	0
Not assessed	-1
Only solid material storage - contained	21
Only solid material storage - not contained	1
Liquid or mixed manure storage – contained	11
Liquid or mixed manure storage – contained, aerobic or covered	21
Liquid or mixed manure storage - not contained	1

If a Greenhouse Gas resource concern is determined to exist for methane emissions from confinement-based animal production for this component, Conservation Practices and Activities related to reducing Greenhouse Gas emissions from confinement-based livestock or poultry production are determined based on an alternative scenario analysis of the PLU using the National Air Quality Site Assessment Tool (NAQSAT – http://naqsat.tamu.edu) and the USDA/EPA Agricultural Air Quality Conservation Measures Guide for Poultry and Livestock Production and are added to the benchmark condition to determine the state of the planned management system.

Table 137*: Feed Management Plan or Strategy to Manage Nitrogen Excretion*

Answer	Existing Condition Score	Reference for Assessment Condition
Feed management plan	30	The client can certify that a feed management plan or strategy is in place to manage nitrogen excretion.

No feed management plan	1	A feed management plan or strategy to manage nitrogen excretion is not being implemented at the PLU.

Component 5: GHGs – grazing operations

Description: Emissions of methane from grazing livestock operations do not excessively contribute to increased atmospheric concentrations of greenhouse gases.

Analysis within CART:

Crop, Forest, Pasture, Range, Associated Agriculture Land

Each PLU will default to a not assessed status for this component. The Planner may identify a Greenhouse Gas resource concern for this component based on site specific conditions. If there are no grazing animals at the PLU, this component is not applicable. Otherwise, a threshold value will be set at 50, and the existing condition question will be triggered:

Table 138: *Grazing Management Plan is Implemented at the PLU*

(Note: purpose of the Grazing Management Plan is to balance the energy and nutrition requirements of the grazing animals with the productivity of the grazing lands)

Answer	Existing Condition Score	Additional Information
Not assessed	-1	
Not applicable	0	
Yes	51	The client can certify that a grazing management plan to balance the energy and nutrition requirements of the grazing animals with the productivity of the grazing lands is being implemented at the PLU.
No	1	A grazing management plan to balance the energy and nutrition requirements of the grazing animals with the productivity of the grazing lands is not being implemented at the PLU.

If a grazing management plan to balance the energy and nutrition requirements of the grazing animals with the productivity of the grazing lands is not being implemented at the PLU, apply Prescribed Grazing (528) to develop, implement, and follow a prescribed grazing plan that balances the energy and nutrition requirements of the grazing animals with the productivity of the grazing lands. Additional practices may be necessary to support Prescribed Grazing (528).

Emissions of Ozone Precursors (Ozone Precursors)

Component 1: Ozone – diesel engines

Description: Emissions of ozone precursors (NOx and VOCs) result in formation of ground-level ozone, which can have negative impacts to human, plant, and animal health.

Objective: Emissions of ozone precursors from diesel engines do not excessively contribute to negative impacts to human, plant or animal health.

Analysis within CART:

Crop, Forest, Range, Pasture, Associated Agriculture Land, Farmstead

A threshold value of 50 will be set, and the existing condition question will be triggered.

Each PLU will trigger an intersection with the Ozone nonattainment geospatial data.

If there are no diesel engines in operation at the PLU, this component is not applicable. Otherwise, the existing condition question will set the existing condition score as seen in Table 139.

Table 139*: Diesel Engine Combustion Sources Existing Condition*

Note: If yes, document all diesel engines larger than 25 brake horsepower, including engine horsepower rating, model year, and annual hours of usage.

Answer	Existing Condition Points	Reference for Assessment Condition
Low risk combustion sources	81	All diesel engines larger than 25 brake horsepower in operation at the PLU are certified to EPA Tier 4 final standards (based on engine model year and horsepower rating).
Low-medium risk combustion sources	74	**For Ozone attainment areas:** All diesel engines larger than 25 brake horsepower in operation at the PLU are certified to at least EPA Tier 3 standards (based on engine model year and horsepower rating). **For Ozone nonattainment areas:** All diesel engines larger than 25 brake horsepower in operation at the PLU are certified to at least EPA Tier 4 interim standards (based on engine model year and horsepower rating).

Medium risk combustion sources	51	**For Ozone attainment areas:** At least 75% of the normal annual horsepower-hours for diesel engines larger than 25 brake horsepower in operation at the PLU are from engines that are certified to at least EPA Tier 3 standards (based on engine model year and horsepower rating). **For Ozone nonattainment areas:** All diesel engines larger than 25 brake horsepower in operation at the PLU are certified to at least EPA Tier 3 standards (based on engine model year and horsepower rating).
High-medium risk combustion sources	26	**For Ozone attainment areas:** At least 50% of the normal annual horsepower-hours for diesel engines larger than 25 brake horsepower in operation at the PLU are from engines that are certified to at least EPA Tier 3 standards (based on engine model year and horsepower rating). **For Ozone nonattainment areas:** At least 75% of the normal annual horsepower-hours for diesel engines larger than 25 brake horsepower in operation at the PLU are from engines that are certified to at least EPA Tier 3 standards (based on engine model year and horsepower rating).
High risk combustion sources	1	**For Ozone attainment areas:** Less than 50% of the normal annual horsepower-hours for diesel engines larger than 25 brake horsepower in operation at the PLU are from engines that are certified to at least EPA Tier 3 standards (based on engine model year and horsepower rating). **For Ozone nonattainment areas:** Less than 75% of the normal annual horsepower-hours for diesel engines larger than 25 brake horsepower in operation at the PLU are from engines that are

		certified to at least EPA Tier 3 standards (based on engine model year and horsepower rating).

Component 2: Ozone – non-engine combustion equipment

Description: Emissions of ozone precursors from non-engine combustion equipment do not excessively contribute to negative impacts to human, plant, or animal health.

Analysis within CART:

Crop, Forest, Range, Pasture, Associated Agriculture Land, Farmstead

A threshold value of 50 will be set. If there are no non-engine combustion sources in operation at the PLU, this component is not applicable. Otherwise, the existing condition question will set the existing condition score as seen in Table 140.

Each PLU will trigger an intersection with the Ozone nonattainment geospatial data.

Table 140*: Non-Engine Combustion Sources Existing Condition*

Note: If yes, document all non-engine combustion sources, including heat input rating, fuel type, and annual hours of usage.

Answer	Existing Condition Points	Reference for Assessment Condition
Not assessed	-1	
Not applicable	0	
Low risk combustion sources	81	All non-engine combustion sources utilize natural gas or propane as fuel and/or emissions control for NOx emissions.
Medium risk combustion sources	51	**For Ozone attainment areas:** At least 50% of the normal annual fuel usage for non-engine combustion sources in operation at the PLU is either natural gas or propane, or at least 50% of the non-engine combustion sources in operation at the PLU utilize emissions control for NOx emissions. **For Ozone nonattainment areas:** At least 75% of the normal annual fuel usage for non-engine combustion sources in operation at the PLU is either natural gas or propane, or at least 75% of the

		non-engine combustion sources in operation at the PLU utilize emissions control for NOx emissions.
High risk combustion sources	1	**For Ozone attainment areas:** Less than 50% of the normal annual fuel usage for non-engine combustion sources in operation at the PLU is either natural gas or propane, and/or less than 50% of the non-engine combustion sources in operation at the PLU utilize emissions control for NOx emissions. **For Ozone nonattainment areas:** Less than 75% of the normal annual fuel usage for non-engine combustion sources in operation at the PLU is either natural gas or propane, and/or less than 75% of the non-engine combustion sources in operation at the PLU utilize emissions control for NOx emissions.

Component 3: Ozone – open burning

Description: Emissions of ozone precursors from fire do not excessively contribute to negative impacts to human, plant, or animal health.

Analysis within CART:

Crop, Forest, Range, Pasture, Associated Agriculture Land, Farmstead

Each PLU will default to a not assessed status for this component. A threshold value of 50 will be set, and the existing condition questions will be triggered:

Table 141*: Are you using fire for management?*

Answer	Existing Condition Points
Not assessed	-1
Not applicable	0
Yes - basic smoke management practices are implemented	51
Yes - basic smoke management practices are NOT implemented	1

If less than 100% of all fire events at the PLU are conducted using Basic Smoke Management Practices, apply Prescribed Burning (338) to develop, implement, and follow a prescribed burn plan that includes Basic Smoke Management Practices for all fire events. Additional practices may be necessary to support Prescribed Burning (338).

Component 4: Ozone – pesticides

Description: Emissions of VOCs from pesticide use do not excessively contribute to negative impacts to human, plant or animal health.

Analysis within CART:

Crop, Forest, Range, Pasture, Associated Agriculture Land, Farmstead

Each PLU will trigger an intersection with the Ozone nonattainment maps. If the PLU is not within a nonattainment or maintenance area for Ozone, this component is not applicable. If the PLU is within a nonattainment or maintenance area for Ozone, the threshold value will depend on the nonattainment or maintenance status as seen in Table 142*: Ozone Pesticide Application Threshold Values*. The threshold value will apply to cover both fumigant and non-fumigant pesticide requirements.

Table 142*: Ozone Pesticide Application Threshold Values*

Ozone Nonattainment Status	Threshold Value
Extreme nonattainment	90
Severe nonattainment	80
Serious nonattainment	70
Moderate nonattainment	60
Maintenance or marginal nonattainment	51

The existing condition questions will set the existing condition score as seen in the table below.

Table 143: *Integrated Pest Management – IPM System*

Note: What kind of Integrated Pest Management (IPM) System is implemented on the PLU to manage pests and pesticide environmental risk?

Answer	Existing Condition Points	Reference for Assessment Condition
Not assessed	-1	
Pest Management Conservation System	91	A full IPM System is utilized including Prevention, Avoidance, Monitoring, and

(Code 595) - Full IPM System for Efficient Production and Environmental Protection		Suppression to manage pests (including invasive plants) to meet production needs and manage pesticide environmental risk, including Windows Pesticide Screening Tool results for risks to water quality. If this answer is selected, do NOT select Practice code 595 on the Existing or Planned Practices pages so as not to double count points.
Full IPM System for Efficient Production	51	A full IPM System is utilized including Prevention, Avoidance, Monitoring, and Suppression to manage pests (including invasive plants) to meet production needs.
No IPM System, but pesticides are used to manage pests.	1	An IPM System is not utilized, but pesticides are applied according to label guidance to manage pests (including invasive plants) to meet production needs.
No IPM System, but pesticides are used to manage pests and spray drift is minimized.	1	An IPM system is not utilized, but pesticides are applied according to label guidance to manage pests (including invasive plants) to meet production needs, and pesticide drift is minimized with drift reducing spray technologies.
No IPM System, but pesticides are used to manage pests and the development of pest resistance is carefully managed.	1	An IPM system is not utilized, but pesticides are applied according to label guidance to manage pests (including invasive plants) to address production needs and the development of pest resistance is carefully managed.
No IPM System, but pesticides are used to manage pests, the development of pest resistance is carefully managed, and spray drift is minimized.	1	An IPM system is not utilized, but pesticides are applied according to label guidance to manage pests (including invasive plants) to address production needs, the development of pest resistance is carefully managed, and pesticide drift is minimized with drift reducing spray technologies.

No pesticides are used to manage pests.	51	Pests (including invasive plants) are managed to meet production needs without the use of pesticides.
No pesticides are used because pests are not managed.	51	Pests (including Invasive plants) are not managed (no pesticides are used) so production may be reduced beyond tolerable limits.

Component 5: Ozone – confined animal activities

Description: Emissions of VOCs from confinement-based livestock production do not excessively contribute to negative impacts to human, plant or animal health.

Analysis within CART:

Farmstead

Each PLU will trigger an intersection with the Ozone nonattainment maps. If the PLU is not within a nonattainment or maintenance area for Ozone, this component is not applicable. If the PLU is within a nonattainment or maintenance area for Ozone, each PLU for the Farmstead land use will default to a not assessed status for this component. The Planner may identify an Ozone resource concern for this component based on site specific conditions. A threshold value will be set at 50.

If there is no confinement-based livestock production at the PLU, this component is not applicable. Otherwise, the existing condition questions will set the existing condition score as seen in Table 144.

Table 144*: Manures, Biosolids, Compost, or Other Soil Amendment and Pathogen Sources*

(Note: Are they stockpiled or stored on the PLU?)

Answer	Existing Condition Points
Not applicable	0
Not assessed	-1
Only solid material storage - contained	51
Only solid material storage - not contained	51
Liquid or mixed manure storage - contained	31
Liquid or mixed manure storage – contained, aerobic or covered	51
Liquid or mixed manure storage - not contained	1

If an Ozone resource concern is determined to exist for VOC emissions from confinement-based animal production for this component, Conservation Practices and Activities related to reducing VOC emissions from confinement-based livestock or poultry production are determined based on an alternative scenario analysis of the PLU using the National Air Quality Site Assessment Tool (NAQSAT – http://naqsat.tamu.edu) and the USDA/EPA Agricultural Air Quality Conservation Measures Guide for Poultry and Livestock Production and are added to the benchmark condition to determine the state of the planned management system.

Objectionable Odors (Odor)

Component 1: Odor – nitrogen fertilizer

Description: Emissions of odorous compounds (VOCs, ammonia and odorous sulfur compounds) can cause nuisance conditions.

Objective: Emissions of ammonia from nitrogen fertilizer application do not excessively contribute to negative odor impacts.

Analysis within CART:

Crop, Forest, Pasture, Associated Agriculture Land

Each PLU will default to a not assessed status for this component. The Planner may identify an Odor resource concern for this component based on site specific conditions. A threshold value will be set at 50.

The existing condition question will set the existing condition score as seen in Table 145.

Table 145*: Existing Condition – Nutrient Application*

Answer	Existing Condition Points	Reference for Assessment Condition
Not assessed	-1	Unknown if nutrients are applied.
No nutrients applied	51	No organic or inorganic nutrients are applied mechanically or by hand. Note that this does not include nutrients deposited by grazing animals when these are the only nutrients applied to the PLU.
Nutrients are applied	1	Organic or inorganic nutrients are applied to the PLU mechanically or by hand.

If there is no NRCS-approved nutrient management plan that specifically addresses nitrogen for the PLU, apply Nutrient Management (590) to develop such a plan.

Component 2: Odor – confined animal activities

Description: Emissions of volatile organic compounds (VOCs), ammonia, and odorous sulfur compounds from confinement-based animal production do not excessively contribute to negative odor impacts.

Analysis within CART:

Farmstead

Each PLU will default to a not assessed status for this component. The Planner may identify an Odor resource concern for this component based on site specific conditions. A threshold value of 50 will be set.

If there is no confinement-based livestock production at the PLU, this component is not applicable. Otherwise, the existing condition questions will set the existing condition score as seen in Table 146.

Table 146*: Odor from Confined Animal Activities*

Note: Has the client or planner observed any odor issues related to confinement-based animal production at the PLU, and have any practices or techniques been previously applied to address the observed odor issues?

Answer	Existing Condition Points	Reference for Assessment Condition
Not Assessed	-1	
Not Applicable	0	
Minimal potential for odor	51	Neither the Planner or client has observed any odor issues related to confinement-based animal production at the PLU OR The client has previously applied practices or techniques to address previous odor observed issues, and the applied practices or techniques have been documented.
Significant potential for odor	1	The client has not previously applied practices or techniques to address observed odor issues.

Conservation Practices and Activities related to reducing odor emissions from confinement-based livestock production are determined based on an analysis of the PLU using the National Air Quality Site Assessment Tool (NAQSAT – http://naqsat.tamu.edu) and the USDA/EPA Agricultural Air Quality Conservation Measures Guide for Poultry and Livestock Production and are added to the existing condition to determine the state of the planned management system.

Emissions of Airborne Reactive Nitrogen (Airborne Nitrogen)

Component 1: Reactive nitrogen – open burning

Description: Emissions of airborne reactive nitrogen (NH_3 and NOx) can negatively impact atmospheric chemistry, cause unwanted fertilization via deposition in sensitive ecosystems, and degrade regional visibility.

Objective: Emissions of airborne reactive nitrogen from fire do not excessively contribute to negative atmospheric and/or ecosystem impacts.

Analysis within CART:

Crop, Forest, Range, Pasture, Farmstead, Associated Agriculture Land

Each PLU will default to a not assessed status for this component. A threshold value of 50 will be set, and the existing condition questions will be triggered:

Table 147*: Are you using fire for management?*

Answer	Existing Condition Points
Not assessed	-1
Not applicable	0
Yes - basic smoke management practices are implemented	51
Yes - basic smoke management practices are NOT implemented	1

If less than 100% of all fire events at the PLU are conducted using Basic Smoke Management Practices, apply Prescribed Burning (338) to develop, implement, and follow a prescribed burn plan that includes Basic Smoke Management Practices for all fire events. Additional practices may be necessary to support Prescribed Burning (338).

Component 2: Reactive nitrogen – nitrogen fertilizer

Description: Emissions of airborne reactive nitrogen from nitrogen fertilizer application do not excessively contribute to negative atmospheric and/or ecosystem impacts.

Analysis within CART:

Crop, Forest, Pasture, Associated Agriculture Land

Each PLU will default to a not assessed status for this component. The Planner may identify an Airborne Reactive Nitrogen resource concern for this component based on site specific conditions. A threshold value will be set at 50.

The existing condition question will set the existing condition score as seen in Table 148.

Table 148*: Existing Condition – Nutrient Application*

Answer	Existing Condition Points	Reference for Assessment Condition
Not assessed	-1	Unknown if nutrients are applied.
No nutrients applied	51	No organic or inorganic nutrients are applied mechanically or by hand. Note that this does not include nutrients deposited by grazing animals when these are the only nutrients applied to the PLU.
Nutrients are applied	1	Organic or inorganic nutrients are applied to the PLU mechanically or by hand.

If there is no NRCS-approved nutrient management plan that specifically addresses nitrogen for the PLU, apply Nutrient Management (590) to develop such a plan.

Component 3: Reactive nitrogen – confined animal activities

Description: Emissions of airborne reactive nitrogen from confinement-based animal production do not excessively contribute to negative atmospheric and/or ecosystem impacts.

Analysis within CART:

Farmstead

Each PLU will default to a not assessed status for this component. The Planner may identify a Reactive Nitrogen concern for this component based on site specific conditions. A threshold value will be set at 50.

If there is no confinement-based livestock production at the PLU, this component is not applicable. Otherwise, the existing condition questions will set the existing condition score.

Table 149: *Manures, Biosolids, Compost, or Other Soil Amendment and Pathogen Sources*

Note: Are they stockpiled or stored on the PLU?

Answer	Existing Condition Points
Not applicable	0
Not assessed	-1
Only solid material storage - contained	11
Only solid material storage - not contained	1
Liquid or mixed manure storage - contained	11

Liquid or mixed manure storage – contained, aerobic or covered	21
Liquid or mixed manure storage - not contained	1

If an Airborne Reactive Nitrogen resource concern is determined to exist based on this analysis of the PLU, Conservation Practices and Activities related to reducing ammonia emissions from confinement-based livestock or poultry production are determined based on an alternative scenario analysis of the PLU using the National Air Quality Site Assessment Tool (NAQSAT – http://naqsat.tamu.edu) and the USDA/EPA Agricultural Air Quality Conservation Measures Guide for Poultry and Livestock Production and are added to the benchmark condition to determine the state of the planned management system.

Table 150*: Feed Management Plan or Strategy to Manage Nitrogen Excretion*

Answer	Existing Condition Score	Reference for Assessment Condition
Feed management plan	40	The client can certify that a feed management plan or strategy is in place to manage nitrogen excretion.
No feed management plan	1	A feed management plan or strategy to manage nitrogen excretion is not being implemented at the PLU.

Plants

Plant Productivity and Health

Component: Plant productivity and health

Description: Improper fertility, management, or plants not adapted to site negatively impact plant productivity, vigor, quality, or some combination of these.

Objective: Improve poor plant productivity and health.

Analysis within CART:

The planner will identify this resource concern based on site-specific conditions using technically completed land health and management assessment methods.

Crop

Each PLU for crop will have a threshold value of 50 set and a benchmark condition set of questions. The existing condition questions will set the existing score as identified below in Table 151 and Table 152*:* .

Table 151*: Crop Plant Productivity*

Answer	Existing Condition Points	Reference for Assessment Condition
High	51	100% of potential Crop yield based on soil, climate, and fertility (10 yr. avg. or county avg.)
Good	40	>75% of potential Crop yield based on soil, climate, and fertility (10 yr. avg.)
Fair	10	>50% of potential Crop yield based on soil, climate, and fertility (10 yr. avg.)
Low	5	>20% of potential Crop yield based on soil, climate, and fertility (10 yr. avg.)
Poor	1	≤20% of potential Crop yield based on soil, climate, and fertility (10 yr. avg.)

Table 152*: Crop Plant Health*

Answer	Existing Condition Points
Plants are healthy	30
Evidence of nutrient deficiency is minimal	20
Evidence of both nutrient deficiency and disease	5
Evidence of plant health damage	1

Pasture

Each PLU for Pasture will have a threshold value of 50 set and a benchmark condition set of questions as seen in Table 153, Table 154, and Table 155.

Table 153*: Pasture Condition Score Sheet - Percent Desirable Plants*

Answer	Existing Condition Points	Reference for assessment condition
Not assessed	-1	
High	25	• Desirable species exceed 80% of stand. • Pasture Condition Score element score = 5
Good	20	• Desirable Species 61-80% of stand. • Pasture Condition Score element score = 4

Fair	17	• Desirable Species 41-60% of stand. • Pasture Condition Score element score = 3
Low	8	• Desirable species 20 – 40% of stand. • Pasture Condition Score element score = 2
Poor	1	• Desirable species <20% of stand. • Pasture Condition Score element score = 1

Table 154*: Pasture Condition Score Sheet – Live or Dormant Plant Cover*

Answer	Existing Condition Points	Reference for assessment condition
Not assessed	-1	
High	20	• More than 95% live (non-dormant) leaf canopy. Remaining is either dead standing material, or bare ground. • Pasture Condition Score element score = 5
Good	17	• 81-95% live leaf canopy. Remaining is either dead standing material, or bare ground. • Pasture Condition Score element score = 4
Fair	10	• 66-80% live leaf canopy. Remaining is either dead standing material, or bare ground. • Pasture Condition Score element score = 3
Low	5	• 40-65% is live leaf canopy Remaining is either dead standing material, or bare ground. • Pasture Condition Score element score = 2
Poor	1	• Less than 40% is live leaf canopy. Remaining is either dead standing material, or bare ground. • Pasture Condition Score element score = 1

Table 155*: Pasture Condition Score Sheet - Plant Vigor*

Answer	Existing Condition Points	Reference for assessment condition
Not assessed	-1	

High	20	• Rapid recovery of desirable forage. All healthy green forage. • Pasture Condition Score element score = 5
Good	17	• Good recovery of desirable forage. Light green and dark green forage present. • Pasture Condition Score element score = 4
Fair	10	• Adequate recovery of desirable forage. Yellowish and dark green areas due to manure and urine patches. • Pasture Condition Score element score = 3
Low	5	• Some recovery. Yellowish green forage, or moderately or sight stunting of desirable forage. • Pasture Condition Score element score = 2
Poor	1	• No plant recovery after grazing/harvest. Pale, yellow or brown, or severe stunting of desirable forage. • Pasture Condition Score element score = 1

Range

Each PLU for Range will have a threshold value of 50 set and the benchmark condition question will be triggered as seen in Table 156.

Table 156*: Rangeland Health – Biotic Integrity*

Answer	Existing Condition Points	Reference for assessment condition
None to Slight	60	Interpreting Indicators of Rangeland Health, version 5
Slight to Moderate	51	Interpreting Indicators of Rangeland Health, version 5
Moderate	30	Interpreting Indicators of Rangeland Health, version 5
Moderate to Extreme	15	Interpreting Indicators of Rangeland Health, version 5
Extreme	1	Interpreting Indicators of Rangeland Health, version 5

Forest

Each PLU for Forest will have a threshold value of 50 set and a benchmark condition set of questions as identified in Table 157: and if needed, Table 158, Table 159, and Table 160.

Table 157*: current condition of the client's Forest Management Plan that addresses plant productivity and health*

Answer	Existing Condition Points	Reference for assessment condition
Plan is actively being followed AND all current practices have been implemented that will improve plant productivity and health	51	If selected, stop because the Existing Condition has been established. NOTE: When this answer has been selected, do NOT select Forest Management Plan (FMP) on the Existing or Planned Practices pages so as not to double count points for having an FMP.
Plan is actively being followed BUT there are still current practices to be implemented that will improve plant productivity and health	15	If selected, the below assessment questions will become active. Complete the assessment questions for this RC below.
No plan exists OR plan exists but is not being actively followed	0	If selected, the below assessment questions will become active. Complete the assessment questions for this RC below.

If either of the last two answer options above are selected, the following questions will become active in CART for the planner to answer.

Table 158*: Tree species managed are native, and best suited for sustainability on the site and commensurate with client's objectives*

Answer	Existing Condition Points	Reference for assessment condition
Yes	25	
No	0	

Table 159*: Stand stocking levels are appropriate for the site and commensurate with client's objectives*

Answer	Existing Condition Points	Reference for assessment condition
Yes	20	
No	0	

Table 160*: Assessment of Tree Vigor (Health) Within a Forest Stand or Management Unit*

Note: What is the proportion of dead and dying trees on the site?

Answer	Existing Condition Points	Reference for assessment condition
None to Slight (<10%)	20	
Slight to Moderate (10-20%)	15	
Moderate (21-40%)	10	
Moderate to Extreme (41-60%)	5	
Extreme (>60%)	0	

Farmstead, Developed Land, Associated Agriculture Land, Other Rural Land

Each PLU will have a threshold value of 50 set and a benchmark condition set of questions as identified in Table 161: .

Table 161: *Plant Productivity and Health*

Answer	Existing Condition Points	Reference for assessment condition
High	50	No significant plant productivity or health related concern exists on this PLU
Good	30	Some productivity or plant health concerns exist
Poor	0	Severe lack of health and productivity for plants in the PLU

Plant Structure and Composition

Component: Plant structure and composition

Description: Plant communities have insufficient composition and structure to achieve ecological functions and management objectives. This includes degradation of wetland habitat, targeted ecosystems, or unique plant communities.

Objective: Improve plant structure and composition.

Analysis within CART:

The planner will identify this resource concern based on site-specific conditions using technically completed land health and management assessment methods. The threshold and existing condition questions will set the existing score by land use as identified below.

Pasture

Each PLU for pasture will have a threshold value of 50 set and a benchmark condition set of questions.

Table 162: *Pasture Condition Score Sheet – Percent Desirable Plants*

Answer	Existing Condition Points	Reference for assessment condition
Not assessed	-1	
High	30	• Desirable species exceed 80% of stand.

		• Pasture Condition Score element score = 5
Good	26	• Desirable Species 61-80% of stand. • Pasture Condition Score element score = 4
Fair	17	• Desirable Species 41-60% of stand. • Pasture Condition Score element score = 3
Low	8	• Desirable species 20 – 40% of stand. • Pasture Condition Score element score = 2
Poor	1	• Desirable species <20% of stand. • Pasture Condition Score element score = 1

Table 163: *Pasture Condition Score Sheet - Plant Vigor*

Answer	Existing Condition Points	Reference for assessment condition
Not Assessed	-1	
High	30	• Rapid recovery of desirable forage. All healthy green forage. • Pasture Condition Score element score = 5
Good	26	• Good recovery of desirable forage. Light green and dark green forage present. • Pasture Condition Score element score = 4
Fair	17	• Adequate recovery of desirable forage. Yellowish and dark green areas due to manure and urine patches. • Pasture Condition Score element score = 3
Low	8	• Some recovery. Yellowish green forage, or moderately or sight stunting of desirable forage. • Pasture Condition Score element score = 2
Poor	1	• No plant recovery after grazing/harvest. Pale, yellow or brown, or severe stunting of desirable forage. • Pasture Condition Score element score = 1

Range

Each PLU for range will have a threshold value of 50 set and a benchmark condition question.

Table 164: *Rangeland Health - Biotic Integrity*

Answer	Existing Condition Points	Reference for assessment condition
Not Assessed	-1	
None to Slight	60	Interpreting Indicators of Rangeland Health, version 5
Slight to Moderate	51	Interpreting Indicators of Rangeland Health, version 5
Moderate	20	Interpreting Indicators of Rangeland Health, version 5
Moderate to Extreme	10	Interpreting Indicators of Rangeland Health, version 5
Extreme	1	Interpreting Indicators of Rangeland Health, version 5

Forest

Each PLU for Forest will have a threshold value of 50 set and a benchmark condition question.

Table 165: *Forest Community Quality*

Note: What proportion of the stand has the expected density, composition, and age structure that demonstrates the representative plant community?

Answer	Existing Condition Points	Reference for assessment condition
>80% of stand	51	Compare stand condition with expected density, composition, and age structure that demonstrates the representative plant community. Use Conservation Tree/Shrub Groups (CTSG), Ecological Site Descriptions (ESD), or other local information.
61-80% of stand	35	Compare stand condition with expected density, composition, and age structure that demonstrates the representative plant community. Compare stand condition with CTSG, ESD or other local information.
41-60% of stand	20	Compare stand condition with expected density, composition, and age structure that demonstrates the representative plant community. Compare stand condition with CTSG, ESD or other local information.

20-40% of stand	10	Compare stand condition with expected density, composition, and age structure that demonstrates the representative plant community. Compare stand condition with CTSG, ESD or other local information.
<20% of stand	1	Compare stand condition with expected density, composition, and age structure that demonstrates the representative plant community. Compare stand condition with CTSG, ESD or other local information.

Crop

Each PLU will have a threshold value of 50 set and a benchmark condition set of questions.

Table 166: *Plant Structure and Composition*

Answer	Existing Condition Points	Reference for assessment condition
Meets	51	The plant community supports the intended land use, client objectives, and the ecological processes are functional.
Does not meet	0	The plant community does not support the intended land use, client objectives, and the ecological processes are not functional.

Plant Pest Pressure

Components: Plant pest pressure, chemical resistance, and invasive species

Description: Excessive pest damage to plants including that from undesirable plants, diseases, animals, soil borne pathogens, and nematodes. This concern addresses plant, animal, and insect species, including invasive species.

Objective: Reduce plant pest pressure.

Analysis within CART:

Crop, Range, Pasture, Forest, Farmstead, Developed Land, Associated Agriculture Land, Other Rural Land

The planner will identify this resource concern based on site-specific conditions using technically completed land health and management assessment tools. A threshold value of 50 will be set and existing condition question will be triggered. The existing condition question will set the existing score.

Note: NRCS policy may exclude funding options on crops

Table 167: *Plant Pest Pressure Existing Condition*

Answer	Pest Pressure Existing Condition Points	Chemical Resistance Existing Condition Points	Invasive Species Existing Condition Points	Reference for Assessment Condition
Not assessed	-1	-1	-1	
Pest Management Conservation System (Code 595) - Full IPM System for Efficient Production and Environmental Protection	51	51	51	A full IPM System is utilized including Prevention, Avoidance, Monitoring, and Suppression to manage pests (including invasive plants) to meet production needs and manage pesticide environmental risk, including Windows Pesticide Screening Tool results for risks to water quality. If this answer is selected, do NOT select Practice code 595 on the Existing or Planned Practices pages so as not to double count points.
Full IPM System for Efficient Production	51	51	51	A full IPM System is utilized including Prevention, Avoidance, Monitoring, and Suppression to manage pests (including invasive plants) to meet production needs.
No IPM System, but pesticides are used to manage pests.	51	1	51	An IPM System is not utilized, but pesticides are applied according to label guidance to manage pests (including invasive plants) to meet production needs.
No IPM System, but pesticides are used to manage pests and spray drift is minimized.	51	1	51	An IPM system is not utilized, but pesticides are applied according to label guidance to manage pests (including invasive plants) to meet production needs, and pesticide drift is minimized with drift reducing spray technologies.

No IPM System, but pesticides are used to manage pests and the development of pest resistance is carefully managed.	51	51	51	An IPM system is not utilized, but pesticides are applied according to label guidance to manage pests (including invasive plants) to address production needs and the development of pest resistance is carefully managed.
No IPM System, but pesticides are used to manage pests, the development of pest resistance is carefully managed, and spray drift is minimized.	51	51	51	An IPM system is not utilized, but pesticides are applied according to label guidance to manage pests (including invasive plants) to address production needs, the development of pest resistance is carefully managed, and pesticide drift is minimized with drift reducing spray technologies.
No pesticides are used to manage pests.	51	51	51	Pests (including invasive plants) are managed to meet production needs without the use of pesticides.
No pesticides are used because pests are not managed.	1	51	1	Pests (including Invasive plants) are not managed (no pesticides are used) so production may be reduced beyond tolerable limits.

Wildfire Hazard from Biomass Accumulation

Component: Wildfire hazard from biomass accumulation

Description: The kinds and amounts of plant green or dead biomass creates wildfire hazards that pose risks to human safety, structures, plants, animals, soil and air resources.

Objective: Reduce biomass accumulation and the risk of wildfire hazard.

Analysis within CART:

The planner will identify this resource concern based on site-specific conditions using technically completed land health and management assessment methods. Each PLU for all land uses will default to a “not assessed” status for wildfire hazard. A threshold value of 50 will be set and existing condition

questions will be triggered. The existing condition questions will set the existing score as seen in Table 168: , Table 169: , and Table *170*.

Any Land Use (except Forest)

Table 168: *Assessment of Risk and Hazard of Wildfire (within All Land Uses Except Forest)*

Answer	Existing Condition Points
Accumulation of plant biomass is being managed to reduce the potential risk of wildfire	60
The potential for wildfire hazard from biomass accumulation exists, but site resources are not at a risk or value level to require fire management	51
The potential for wildfire hazard from biomass accumulation exists	30
Significant wildfire hazard from biomass accumulation exists	1

Forest

Table 169: *Wildfire Hazard Potential on the site (LANDFIRE, USFS, or other local wildfire hazard database)*

Answer	Existing Condition Points	Reference for assessment condition
Very Low	25	
Low	20	
Moderate	10	
High	5	
Very High	0	

Table 170: *Percentage of the site that has forest conditions that will support the ignition and propagation of an active wildfire*

Answer	Existing Condition Points	Reference for assessment condition

<10% of Stand	35	
10-20% of Stand	30	
21-50% of Stand	15	
51-70% of Stand	5	
>70% of stand	0	

Animals

Terrestrial Habitat for Wildlife and Invertebrates

Component: Terrestrial habitat for wildlife and invertebrates

Description: Quantity, quality or connectivity of food, cover, space, shelter and/or water is inadequate to meet requirements of identified terrestrial wildlife or invertebrate species.

Objective: Improve quantity and quality of food, water, cover or shelter, habitat continuity, or some combination of these for terrestrial wildlife.

Analysis within CART:

The planner may identify this resource concern based on site-specific conditions, client input, or both. A threshold value of 50 will be set. This value is equivalent to assessment threshold of 0.5 on the default 0 to 100 scale used in CART condition points. The existing condition question will set the existing condition points.

The planner will first select the Assessment method used to evaluate terrestrial habitat conditions on the PLU.

In the future, each PLU with an attributed land use will trigger a web service to determine if the PLU is located within a priority terrestrial habitat area (e.g., Working Lands for Wildlife, Threatened/Endangered Species range and/or critical habitat (USFWS ECOS), NatureServe National Species Dataset).

Table 171: *Assessment Method*

Answer	Description/comments
Working Lands for Wildlife Guide or State Wildlife Guide	Go to Terrestrial Habitat Existing Condition
National Land Use Assessment	Go to Preliminary Terrestrial Habitat Assessment Questions by Land Use below

NOTE: If a state developed WHEG or other external assessment developed by a state is used to assess habitat, then preliminary assessment land use questions are bypassed (i.e., they don't need to be answered), and the corresponding answer for Terrestrial Habitat Existing Condition should be selected for the external assessment.

Table 172: *Terrestrial Habitat Existing Condition*

Answer	Description/comments	Existing Condition Points
Excellent	Habitat quality is defined as *excellent* for the priority species. WHEG range 0.7 to 1.0	70
Good	Habitat quality is defined as *good* for the priority species. WHEG range 0.5 to <0.7	50
Fair	Habitat quality is defined as *fair* for the priority species. WHEG range 0.3 to <0.5	30
Poor	Habitat quality is defined as *poor* for the priority species. WHEG range 0.1 to <0.3	10
Absent	Habitat indicated by the web service is not actually present on the PLU. Because habitat is absent, resource concern identified by the web service does not apply.	0

Preliminary Terrestrial Habitat Assessment Questions by Land use

Land uses refer to those officially defined by NRCS. See NRCS Circular 180-14-1 (10/01/2013).

These preliminary land use assessments can be used if a State WHEG or other state approved wildlife evaluation is not used. For questions related to terminology or applicability to your State pertaining to these preliminary land use assessments, please see your State supplemental guidance.

Table 173: *Crop (Annual and Mixed) + (Perennial) Preliminary Assessment Questions and Answer Choices*

Question	Crop (Annual and Mixed) + (Perennial) Preliminary Assessment Questions and Answer Choices	Existing Condition Points
1)	Is the cropland flooded annually (or as approved by State) to provide habitat for wetland wildlife, target species, or both?	

	a. Yes	
	b. No	
If Yes to Question #1, continue below		
2)	Is surface water present sufficient in duration and depth for target species? Instructions: Calculate by considering consecutive days of planned surface water present. Dependable artificial water must guarantee water for the time period indicated. Natural precipitation must have >60% probability of flooding and must flood ≥33% of field, otherwise select No for Question #1. Critical months of flooding are determined by State biologist.	
	a. Yes	33
	b. No	0
3)	What is the frequency of the flooding or inundation? Instructions: Must flood a minimum of 33% of the field, otherwise select No for Question #1.	
	a. <2 out of 3 years.	7
	b. 2 out of 3 years with dependable artificial water or precipitation driven flooding on C or D soils.	17
	c. Annually with dependable artificial water or precipitation driven flooding on C or D soils.	33
4)	What is the size of the flooded area or inundation?	
	a. ≤33% of the field.	7
	b. >33 and ≤50% of the field.	17
	c. >50 and ≤75% of the field.	27
	d. >75% of the field.	34
If No to Question #1, continue below		
2)	What is the composition of Non-Cropland Habitat Elements (NCHE)? Instructions: NCHE are habitat elements associated with crop fields, such as field borders, odd areas, windbreaks, wetlands,	

	brushy draws, hedgerows, seeps, riparian areas, vegetated ditches, native vegetated communities, rare and declining habitats, and center pivot corners, occurring within the field **or** directly adjacent to the cropland field, such as CRP, woodlands, and riparian areas. Undesirable species already defined by states.	
	a. Herbaceous cover with >75% undesirable species.	0
	b. Herbaceous cover > 50% of introduced species with low wildlife value.	2
	c. Cover composed > 50% of native plants; some structural or functional groups (e.g., warm season tall grasses, warm season mid-grasses, warm season short grasses, cool season mid-grasses, perennial forbs, shrubs, and trees) expected for the site are missing; number of species are fewer than expected for the ecological site or site potential.	6
	d. Herbaceous cover either native herbaceous vegetation or introduced species with high wildlife value, such as those often included in wildlife seed mixes.	8
	e. Cover is composed of >75% of all structural or functional groups (e.g., warm season grasses, cool season grasses, perennial forbs, shrubs, and trees) expected for the site; number of species in each group closely matches that expected for the ecological site or site potential.	11
3)	What amount of NCHE is within **or** directly adjacent to the field? Instructions: Each of these elements must be wildlife friendly as determined by the State biologist. Eligible NCHE must be under the control of the applicant and ≥30 feet wide and ≥0.1 acre. NCHE must meet state quality standards for wildlife habitat as defined by the NRCS State biologist with guidance from the State wildlife agency.	
	a. ≤1% of the field.	0
	b. >1% and ≤5% of the field.	3
	c. >5% and ≤10% of the field.	9
	d. >10% of the field.	11
4)	What is the average width of NCHE within **or** directly adjacent to the field?	

	a. <30 feet wide.	0
	b. ≥30 to and ≤75 feet wide.	6
	c. >75 to and ≤120 feet wide.	9
	d. >120 feet wide.	11
5)	What is the maximum distance for 50% of the field (i.e., average distance) from the NCHE? The distance can be estimated to either NCHE within the field **or** to NCHE in an adjacent field that is controlled by the applicant.	
	a. ≤330 feet.	11
	b. >330 feet and ≤660 feet.	9
	c. >660 feet and ≤1320 feet.	6
	d. >1320 feet and ≤2640 feet.	2
	e. >2640 feet.	0
6)	What is the crop rotation? Instructions: Fallow = cropland rested during the growing season. States may modify with NTSC concurrence.	
	a. Continuous row or truck crops with little value for wildlife (e.g., corn, sorghum, soybeans, etc.).	0
	b. Continuous small grain.	2
	c. Row crop - small grain (e.g., corn-soybeans-wheat)	3
	d. Rotation includes small grains **and** forage crops (i.e., alfalfa, clover, etc.)	6
	e. Small grain - summer fallow (does not include fallow that involves cultivation practices that reduce cover, e.g., summer plowing)	8
	f. Contour strip cropping (include small grains and hay **or** row crops, small grains, and hay)	11
7)	Is a winter food source provided?	
	a. Fall tilled; no winter food	0

	b. No fall tillage	1
	c. ¼ to ≤1 acre of food plot or unharvested grain per 40 acres of cropland (minimum 30 feet wide and next to noncrop cover).	3
	d. Winter food source is not a limiting factor for targeted species	5
	e. >1 acre of food plot or unharvested grain per 40 acres of cropland (minimum 30 feet wide and next to noncrop cover).	6
	f. Winter cover crop or hay/forage crop >50% and <75% of field. Crop height is adequate height for the target species.	9
	g. Winter cover crop or hay/forage crop >75% of field. Crop height is adequate height for the target species.	11
8)	What is the residue or stubble management for the over-winter condition? Instructions: Select the condition most typical for your rotation. Wheat-fallow rotations would select from a, b, f, or g. Crops that don't leave waste grain (cotton, peanuts, etc.) would select from a, b, c. Residue or stubble management must apply to at least 50% of the field.	
	a. Fall tillage with <30% residue.	0
	b. Fall tillage with ≥30% residue.	1
	c. Undisturbed soybean residue or corn silage.	2
	d. Stalks chopped or shredded, no soil disturbance or grasses or legumes in rotation.	4
	e. Stalks gleaned by livestock, no mechanical disturbance.	6
	f. Grain stubble or hay/forage crop left standing overwinter <8 inches.	8
	g. Grain stubble or hay/forage crop left standing overwinter >8 inches.	12
9)	If hay is part of crop rotation, what is the species composition of wildlife-unfriendly species? Instructions: Wildlife friendly and unfriendly species are defined by the States.	
	a. Hayland composed of wildlife-unfriendly species.	1
	b. Hayland composed of one or two wildlife-friendly species.	3

	c. Hayland composed of three to five wildlife-friendly species.	7
	d. Hayland composed of more than five wildlife-friendly species.	11
10)	If hay is part of crop rotation, what is the harvest schedule? Instructions: Nesting season is defined by states. Haying methods and patterns that consider wildlife needs include, but are not limited to: minimum mowing height, reduced cutting speed, flushing bars, mowing toward the outside of the field, wildlife exclusion areas, mow only during daylight.	
	a. Entire field cut during the nesting season.	0
	b. Portions of the field cut before the nesting season with some areas excluded for wildlife or haying methods and patterns considers wildlife needs.	2
	c. >50% of hayland unharvested until end of nesting season (as defined by State) OR hay is harvested after 80% of the nesting season is concluded and haying methods and patterns used considers wildlife needs.	6
	d. Hay cut not more than once per year and is cut before or after the nesting season. Cuts before nesting season must be far enough in advance to allow for sufficient regrowth for target species. Consult with State biologist for adequate time windows for target species.	8
	e. Hay cut before or after the nesting season. Haying methods and patterns considers wildlife needs. Cuts before nesting season must be far enough in advance to allow for sufficient regrowth for target species. Consult with State biologist for adequate time windows for target species.	11

Table 174: *Pasture Preliminary Assessment Questions and Answer Choices*

Question	Pasture Preliminary Assessment Questions and Answer Choices	Existing Condition Points
1)	What is the species composition of the pasture? Instructions: Pasture **and** Non-Pasture Habitat Elements (NPHE)- Non-pastureland cover such as field borders, odd areas, windbreaks, wetlands, brushy draws, hedgerows, seeps, riparian	

	areas, and center pivot corners that occur within the field. Or, NPHE that occurs directly adjacent to the pasture, such as CRP, woodlands, and riparian areas. Wildlife-friendly and unfriendly species are defined by the States.	
	a. Composed of wildlife-unfriendly species.	0
	b. Composed of wildlife-unfriendly grass with >33% legume cover.	6
	c. Composed of a mixture of one to three wildlife-friendly grasses and a legume.	14
	d. Composed of >3 wildlife-friendly grasses and legumes or forbs.	20
2)	What is the grazing management? Instructions: If managing for species of concern, consult with the State biologist. Exceptions can be made to answer descriptions at discretion of State biologist. Light grazing (16-35% use): Key forage plants lightly to moderately used. Practically no use of low-value forage plants. Moderate grazing (36-65% use): Key forage plants are used ≤ 50% for the season of grazing and the ecological site pasture state involved. Some use of low-value forage plants. All fully accessible areas are grazed; some trampling damage may be evident. Heavy grazing (66-80% use): Key forage plants closely cropped. Low-value forage plants generally being grazed. Trampling damage is widespread in accessible areas.	
	a. All forage is closely grazed, livestock trails are numerous and trampling damage is widespread.	0
	b. Light to moderate grazing over the entire field. Little evidence of trails.	6
	c. Livestock are rotated through less than four paddocks based on minimum forage height and condition for wildlife (defined by State biologist).	14
	d. Livestock are rotated through four or more paddocks based on minimum forage height and condition for wildlife (defined by State biologist); one paddock is not grazed (unless part of a Prescribed Grazing plan) or hayed until after nesting season.	20

3)	What is the species composition of NPHE within or directly adjacent to the field (e.g., not mowed, grazed, burned, spayed, etc.) during nesting season? Instructions: NPHE areas must be ≥30 feet wide and ≥0.1 acre in area. NPHE includes paddocks not grazed during the nesting season. NPHE must be under the control of the applicant and must meet State quality standards for wildlife habitat as defined by the NRCS State biologist with guidance from the State wildlife agency.	
	a. Herbaceous or woody cover with >75% undesirable species.	0
	b. Herbaceous or woody cover primarily of introduced species.	3
	c. Herbaceous or woody cover either native herbaceous vegetation or introduced species with high wildlife value, such as those often included in wildlife seed mixes.	8
	d. Cover composed primarily of native plants; some structural or functional groups (e.g., warm season tall grasses, warm season mid-grasses, warm season short grasses, cool season mid-grasses, perennial forbs, shrubs, and trees) expected for the site are missing; number of species are fewer than expected for the ecological site.	11
	e. Cover is composed of all structural or functional groups (e.g., warm season tall grasses, warm season mid-grasses, warm season short grasses, cool season mid-grasses, perennial forbs, shrubs, and trees) expected for the site; number of species in each group closely matches that expected for the ecological site.	15
4)	What is the amount of NPHE within or directly adjacent to the field? Instructions: NPHE areas must be ≥30 feet wide and ≥0.1 acre in area.	
	a. ≤1% of the field.	0
	b. >1 and ≤5% of the field.	5
	c. >5 and ≤10% of the field.	12
	d. >10% of the field.	15
5)	What is the width of NPHE within **or** directly adjacent to the field? Instructions: Minimum patch size ≥0.1 acre.	
	a. <30 feet wide.	0

	b. ≥30 to and ≤75 feet wide.	5
	c. >75 to and ≤120 feet wide.	12
	d. >120 feet wide.	15
6)	What is the maximum distance for 50% of the field (i.e., average distance) from the NPHE? Instructions: The distance can be estimated to either NPHE within the field **or** to NPHE in a directly adjacent field that is controlled by the applicant.	
	a. ≤330 feet.	15
	b. >330 feet and ≤660 feet.	12
	c. >660 feet and ≤1320 feet.	8
	d. >1320 feet and ≤2640 feet.	3
	e. >2640 feet.	0

Table 175: *Range Preliminary Assessment Questions and Answer Choices*

Question	Range Preliminary Assessment Questions and Answer Choices	Existing Condition Points
1)	What is the species composition of the rangeland?? Instructions: Plant group types (e.g., structural and functional groups) are suites or groups of plant species that are grouped together because they share similarities, such as shoot or root structure, photosynthetic pathways, nitrogen-fixing ability, life cycle, etc. Examples include cool-season tall grasses, cool-season midgrasses, warm-season tall grasses, warm season midgrasses, warm season short grasses, annual grasses, perennial forbs, biennial forbs, annual forbs, shrubs, half-shrubs, deciduous trees, evergreen trees, cacti, yucca/yucca-like plants, succulent forbs, and leafy forbs (National Range and Pasture Handbook, p.3.1-13). Invasive or noxious species may not be used to represent a plant group type or structural type.	

	a. Number of plant group types (structural or functional groups) <25% of ecological potential, relative dominance of structural or functional groups has been dramatically altered, number of species within structural or functional groups dramatically reduced, or some combination of these.	2
	b. Number of plant group types (structural or functional groups) represents 25-50% of potential, one dominant group and/or one or more subdominant group replaced by structural or functional groups not expected for the site, number of species within structural or functional groups has been significantly reduced, or some combination of these.	5
	c. Number of plant group types (structural or functional groups) represents 51 to 75%, one or more subdominant structural or functional groups replaced by structural or functional groups not expected for the site, the number of species within the structural or functional groups has been moderately reduced, or some combination of these.	15
	d. Number of plant group types (structural or functional groups) (e.g., warm season tall grasses, warm season midgrasses, warm season short grasses, cool season midgrasses, perennial forbs, and shrubs) represents >75% of site potential and number of species in each group closely match that expected for the ecological site.	20
2)	What is the grazing management? Instructions: If managing for species of concern, consult with the State biologist. Exceptions can be made to answer descriptions at discretion of State biologist. Light grazing (16-35% use): Key forage plants lightly to moderately used. Practically no use of low-value forage plants. Most of accessible range shows grazing. Moderate grazing (36-65% use): Key forage plants are used ≤ 50% for the season of grazing and range sites involved. Some use of low-value forage plants. All fully accessible areas are grazed; some trampling damage may be evident. Heavy grazing (66-80% use): Key forage plants closely cropped. Low-value forage plants generally being grazed. Trampling damage is widespread in accessible areas.	

	a. The unit is heavily to severely grazed. No over winter cover.	0
	b. The unit is moderately grazed without ungrazed or lightly grazed patches. Standing grass or forb cover is only seasonally available.	5
	c. The unit is moderately grazed with some ungrazed or lightly grazed patches. Standing grass or forb cover is present during the winter and through the reproductive season.	12
	d. The unit is ungrazed or lightly grazed with numerous ungrazed areas creating a patchy appearance. Standing grass or forb cover is present during the winter and through the reproductive season (for example, 5-8 inch height of grass or forb cover is maintained on mid to tall grasses through winter and reproductive seasons).	20
3)	What percentage of fence does not meet the State's wildlife friendly criteria (for example ref. Montana Fish, Wildlife & Parks, A Landowner's Guide to Wildlife Friendly Fences: How to Build Fence with Wildlife in Mind, 2008; Wyoming Game & Fish Department, Fencing Guidelines for Wildlife, 2004)?	
	a. ≤25%.	9
	b. >25 and ≤50%.	7
	c. >50% and ≤75%.	5
	d. >75%.	0
4)	What percentage of artificial water sources provide for safe access and escape for wildlife, provide year-round water, and are free of hazards for aerial drinking wildlife (e.g., bats, swallows, etc., ref. BCI Wildlife Water Handbook, 2007)? Instructions: Use only if applicable for the area.	
	a. Artificial watering sources are not applicable for the area.	8
	b. ≤25%.	0
	c. >25 and ≤50%.	4
	d. >50% and ≤75%.	8
	e. >75%.	11
5)	What is the degree of woody species management?	

	a. Woody species are not managed for wildlife. There is an evident browse line or brush is totally eliminated with brush control measures.	0
	b. Woody species are managed so that populations are consistent with the desired ecological state or beneficial to targeted wildlife species. There is absence of a browse line, although hedging on key browse plants may be observed. Brush is only partially eliminated with brush control measures.	13
	c. Woody species are managed so that populations are consistent with the desired ecological state/ESDs or targeted wildlife species. There is absence of a browse line or hedging on key browse plants. If brush is controlled, it is done only partially in patterns that fit the landscape with wildlife considerations.	20
6)	What is the proportion of invasive or noxious plants (as determined by state lists)?	
	a. ≤5% of the site has invasive or noxious plants that appear controlled.	20
	b. >5 and ≤20% of the site has invasive or noxious plants that appear controlled.	13
	c. >20% of the site has invasive or noxious plants.	0

Table 176: *Forest Preliminary Assessment Questions and Answer Choices*

Question	Forest Preliminary Assessment Questions and Answer Choices	Existing Condition Points
1)	Do you have a forest or woodland management plan that contains prescriptions for a target species? Instructions: History of past or current forest or woodland management.	
	a. Yes	15
	b. No	0
2)	Based on land resource inventory data (soil survey, ESD, historical research, etc.), are trees within the forest stand native and likely to have historically existed on site?	

	a. Yes	15
	b. No	0
3)	Does your forest stand or woodlands type, extent, and management provide sufficient habitat for target wildlife or pollinators? Instructions: Guidance on sufficient habitat for target wildlife or pollinators set by State biologist.	
	a. Yes	15
	b. No	0
4)	Are invasive plants, insects, or diseases (as determined by State lists) managed and not contributing to the degradation of the forest or woodland habitat such that it negatively impacts target wildlife or pollinator species?	
	a. Yes	15
	b. No	0
5)	What is the percent cover of native shrubs, vines and herbaceous plants combined, within the understory?	
	a. >90%	10
	b. >75% and ≤90%	8
	c. >50% and ≤75%	6
	d. >25% and ≤50%	4
	e. >10% and ≤25%	2
	f. ≤10%	0
6)	What is the extent and management of invasive plant species?	
	a. No invasive plants identified, no damage/infestation.	15
	b. ≤15%, active management.	11
	c. ≤15%, no active management.	8

	d. >15%, active management.	5
	e. >15%, no active management.	0
7)	Are livestock present in the forested area?	
	a. No	15
	b. Yes, livestock are being utilized to maintain or enhance wildlife habitat according to a Prescribed Grazing Plan.	15
	c. Yes, livestock are used to maintain wildlife habitat.	6
	d. Yes, grazing management plan absent and grazing is not done to manage for wildlife.	-15

Associated Agriculture Lands

Unless a State WHEG has been developed, Associated Agriculture Lands is not being assessed by preliminary assessment questions for wildlife potential at this time due to the diversity of this land use. This land use should still be subject to filtering or prepopulating done by geoprocessing operations of spatial datasets.

Farmstead

Unless a State WHEG has been developed, Farmstead is not being assessed by preliminary assessment questions for wildlife potential at this time due to the diversity of this land use. This land use should still be subject to filtering or prepopulating done by geoprocessing operations of spatial datasets.

Aquatic Habitat for Fish and Other Organisms

Component: Aquatic habitat for fish and other organisms

Description: Habitat requirements of identified fish and other organisms are inadequate.

Objective: Provide water that is sufficient in quality and extent to meet target species of guild habitat requirements, remove barriers to enable aquatic species movement and improve associated riparian habitat to meet target species or guild habitat requirements.

Analysis within CART:

Crop, Forest, Range, Pasture, Farmstead, Associated Agriculture Land, Other Rural Land

If a water land use or a water feature modifier on a land use has been identified on the land unit and Aquatic Habitat is selected as a Resource Concern to assess, a default threshold value of 50 will be set

and the Assessment Method question will be triggered (see Table 171). Planners can select the "Working Lands for Wildlife Guide or State Wildlife Guide option and answer the Aquatic Habitat Exiting Condition below (see Table 177).

In the future, a web service will be used to determine if the PLU is located within or contains a priority aquatic habitat area (e.g., Threatened/Endangered Species (USFWS ECOS, NOAA NMFS Endangered Species Act Critical Habitat), Essential Fish Habitat, Section 303(d) of the Clean Water Act for temperature and sediment, NatureServe National Species Dataset)

The planner may identify this resource concern based on site-specific conditions, client input, or both. Preliminary assessment questions below will be answered based on the applicable water feature within the PLU. In order to select a water feature, the water feature modifier must first be selected for a land use on the Assessment Summary page in CART. NOTE: If SVAP2 (or other state approved assessment protocol) has already been run on the PLU and the evaluation scores the property as Excellent, Good, Fair, or Poor, points shall be assigned per Table 177 and Preliminary Questions listed below may be bypassed (i.e., they do not need to be answered).

Table 177*: Aquatic Habitat Existing Condition*

Answer	Existing Condition Points	Reference for Assessment Condition
Excellent	70	Habitat quality is defined as *excellent* for the priority species. (SVAP 9-10, WHEG range 0.7 to 1.0, or other state approved assessment)
Good	51	Habitat quality is defined as *good* for the priority species. (SVAP 7-8.9, WHEG range 0.5 to <0.7, or other state approved assessment)
Fair	30	Habitat quality is defined as *fair* for the priority species. (SVAP 5-6.9, WHEG range 0.3 to <0.5, or other state approved assessment)
Poor	10	Habitat quality is defined as *poor* for the priority species. (SVAP <5, WHEG range 0.1 to <0.3, or other state approved assessment)
Absent	NA	Habitat indicated by the web service is not actually present on the PLU. Because habitat is absent, resource concern identified by the web service does not apply. No further evaluation is needed

Table 178*: Preliminary Aquatic Habitat Assessment Questions and Answer Choices*

Question	Aquatic Habitat Preliminary Assessment Questions and Answer Choices	Existing Condition Points
1)	What water features are present on the PLU? Instructions: Select all that apply. (Might be prepopulated by geoprocessing USGS NHD/NHDPlus HR geospatial dataset. Should also have a text entry box or link to/instructions to complete Conservation Assistance Notes to indicate and describe multiple water features of the same type on the PLU as well as specific on individual features of the same type so they can be distinguished in the future.)	
	a. Lake/Pond	*See Lake/Pond questions*
	b. River	*See River questions*
	c. Stream	*See Stream questions*
	d. Wetland	*See Wetland questions*
Lake/Pond		
1)	What is the extent of the natural vegetation surrounding the lake and pond? Instructions: For this element, "natural vegetation" means plant communities with species native to the site or introduced species that have become "naturalized" and function similarly to native species. Plant species should consist of multiple structural layers (grasses and forbs, shrubs, and trees) of different age-classes.	
	a. >75% of the perimeter of the lake/pond that is suitable for plant growth consists of at least a 33-foot-wide zone of native or natural vegetation.	40
	b. >50% but ≤75% of the perimeter of the lake/pond that is suitable for plant growth consists of at least a 33-foot-wide zone of native or natural vegetation.	26

	c. >10% but ≤50% of the perimeter of the lake/pond that is suitable for plant growth consists of at least a 33-foot-wide zone of native or natural vegetation.	13
	d. ≤10% of the perimeter of the lake/pond suitable for plant growth consists of at least a 33-foot-wide zone of native or natural vegetation.	0
2)	What is the quality of the riparian zone? Instructions: This element rates the functional value of the riparian zone to protect the lake or pond from shoreline erosion and provide habitat components for fish and wildlife. Plant species should consist of multiple structural layers (e.g., grasses, forbs, shrubs, and trees). For the highest ratings, there should be no evidence of concentrated flows through the riparian zone per SVAP.	
	a. Natural and diverse riparian vegetation with composition, density, and age structure appropriate for the site, no invasive species present, and no evidence of concentrated flows.	40
	b. Natural and diverse riparian vegetation with composition, density, and age structure appropriate for the site, invasive species present but controlled, no concentrated flows.	26
	c. Natural vegetation present but compromised by poor management; evidence of concentrated flows; invasive species common (>40%).	13
	d. Little or no natural vegetation in the riparian zone, >50% invasive species, and evidence of concentrated flows into the lake/pond.	0
River		
1)	Is water available year-round or in quality and extent to support habitat requirements for target species? Instructions: Guidance on habitat requirements for target species set by State biologist.	

	a. Yes	17
	b. Otherwise	0
If b) Otherwise is selected for question number 1, the following additional question should be answered.		
	Is the lack of water caused by offsite conditions? Instructions: Lack of water may be due to conditions outside of control of the producer and landowner. This question is a way to note that situation.	
	a. Yes	0
	b. No	-50
2)	Are there physical structures, water withdrawals, water quality, or some combination of these that restricts or prohibits movement of aquatic species? Instructions: This will be prepopulated by a spatial dataset when available, but datasets are often unreliable at the PLU level and passage conditions must be verified on site. Coordinate with State Technical Specialist for passage requirements of local target species	
	a. Yes, verified in field.	-30
	b. No, verified in field.	17
3)	Is natural and diverse riparian vegetation that extends at least one bankfull width onto the floodplain, with vegetation gaps not exceeding 10% of the property length present? Instructions: Riparian vegetation must be of appropriate composition, density, and age structure appropriate to the site.	
	a. Yes	17
	b. No	0
Stream		
1)	Are there eight or more aquatic habitat features present on the PLU stream reach?	

	Instructions: Aquatic habitat features include: 1) Logs &/or large wood- 2/reach; 2) Small wood accumulations- 1/reach; 3)Deep pools- 2/reach; 4) Secondary pools- 4/reach; 5) Overhanging veg- 3/reach; 6) Large boulders-3/reach if no wood, 2/reach if wood present; 7) Small boulder clusters- 3/reach; 8) Cobble riffles- 2/reach; 9) Undercut banks- 3/reach; 10) Thick root mats- 3/reach; 11) Macrophyte beds- 1/reach; 12) Off-channel habitats- 2/reach; 13) Other locally important habitat feature. From SVAP manual.	
	a. Yes	14
	b. No	0
2)	Is water available year-round or in quality and extent to support habitat requirements for target species? Instructions: Guidance on habitat requirements for target species set by State biologist.	
	a. Yes	14
	b. No	0
If b) No is selected for question number 2, the following additional question should be answered.		
3)	Is the lack of water caused by off-site conditions? Instructions: Lack of water may be due to conditions outside of control of the producer and landowner. This question is a way to note that situation.	
	a. Yes	0
	b. No	-50
4)	Are there physical structures, water withdrawals, water quality, or some combination of these that restricts or prohibits movement of aquatic species? Instructions: (This should be prepopulated by a spatial dataset (Fish Passage Barriers (known and potential)). If detected should prompt for a requirement of verification on-site for habitat presence.)	

	a. Yes, verified in field.	-30
	b. No, verified in field.	14
5)	Is natural and diverse riparian vegetation that extends at least one bankfull width onto the floodplain, with vegetation gaps not exceeding 10% of the property length present? Instructions: Riparian vegetation must be of appropriate composition, density, and age structure appropriate to the site.	
	a. Yes	14
	b. No	0
Wetland		
1)	What is the extent of the riparian buffer around the wetland? Instructions: This element rates the extent of buffer around the perimeter of a wetland. Estimate the width of the vegetation zone from the edge of the wetland out to the edge of the cropland, range or forest	
	a. >75% of the perimeter of the wetland is buffered by a >33-ft-wide strip of perennial vegetative cover.	40
	b. ≥50% but ≤75% of the perimeter of wetland is buffered by a >33-ft-wide strip of perennial vegetative cover.	30
	c. ≥10% but <50% of the perimeter of the wetland is buffered by a >33-ft-wide strip of perennial vegetative cover.	20
	d. <10% of the perimeter of the wetland is buffered by a ≥33-ft-wide strip of perennial vegetative cover.	10
2)	What is the quality of the riparian buffer around the wetland? Instructions: For this element, "natural vegetation" means plant communities with species native to the site or introduced species that have become "naturalized" and function similarly to native species. Plant species should consist of multiple	

	structural layers (e.g., grasses and forbs, shrubs, and trees).	
	a. Natural and diverse riparian vegetation with composition, density, and age structure appropriate for the site. Little or no invasive species present.	40
	b. Natural and diverse riparian vegetation with composition, density, and age structure appropriate for the site, invasive species (<30% of plant cover), and landowner is taking measures to control their spread.	28
	c. Natural vegetation compromised by poor management; invasive species (>30% but <50% of plant cover).	12
	d. Little or no natural vegetation. Invasive species widespread (>50 % of plant cover).	0

Elevated Water Temperature (Water Temperature)

Component: Water temperature effects on aquatic habitat

Description: Surface water temperatures exceed State or Federal standards in downstream receiving waters which limits its use for intended purposes.

Objective: Lower stream water temperature and/or prevent additional water temperature increases in downstream receiving waters.

Analysis within CART:

Any Land Use

A standard threshold value of 50 will be set. The existing condition question will be triggered, and points will be assigned based on the answers seen in Table 179.

Table 179*: Section 303(d) listing of Clean Water Act for Temperature is caused by onsite conditions*

Answer	Existing Condition Points
Yes	1
No	30

Preliminary assessment questions will be asked as part of the River and Stream Preliminary Aquatic Habitat Assessments to further assess PLU existing condition. The planner may also identify this

resource concern based on site-specific conditions. Conservation practices and activities are then added to the existing condition to determine the state of the management system.

Table 180*: Preliminary Elevated Water Temperature Assessment Questions*

Question	Answer	Existing Condition Points
Is natural and diverse riparian vegetation that extends at least one bankfull width onto the floodplain, with vegetation gaps not exceeding 10% of the property length present? Instructions: Riparian vegetation must be of appropriate composition, density, and age structure appropriate to the site. Based on planning criteria for elevated water temperature that is conditional on SVAP elements 4 & 5 riparian area quantity and quality.	a. Yes	25
	b. No	0
Is ≥50% of water surface shaded within the length of the stream in landowner's property?? Instructions: Applicable to both cold-water and warm-water streams. Based on planning criteria for elevated water temperature that is conditional on SVAP element 6 canopy cover. This element is particularly sensitive to the type of stream (stream class) and fish community that is being assessed and calibration of scoring may be necessary. Planner override may be used when the specific onsite conditions dictate that a "No" answer relates to beneficial effect.	a. Yes	25
	b. No	0

Feed and Forage Balance

Component: Feed and forage balance

Description: Feed and forage quality or quantity is inadequate for nutritional needs and production goals of the kinds and classes of livestock.

Objective: Balance the quantity and quality of feed and forage to meet livestock needs and reduce negative impacts to other resources.

Analysis within CART:

The planner will identify this resource concern based on site-specific conditions using technically completed land health and management assessment methods. A threshold value of 50 will be set and existing condition question will be triggered. The existing condition question will set the existing score as seen in Table 181 and Table 182.

Crop (grazed), Pasture, Range, Forest (grazed)

Table 181: *Livestock Feed and Forage Imbalance Existing Condition*

Answer	Existing Condition Points
Not assessed	-1
Not applicable	0
Adequate forage supply and producer desired goals are being met	51
Inadequate forage supply and producer desired production goals are NOT being met	1

Farmstead

Table 182: *Livestock Feed and Forage Imbalance Existing Condition (Farmstead)*

Answer	Existing Condition Points
Not assessed	-1
Not applicable	0
Livestock feed, roughage, and supplemental nutritional requirements are met	51
Livestock feed, roughage, and supplemental nutritional requirements are NOT met	1

Inadequate Livestock Shelter

Component: Inadequate livestock shelter

Description: Livestock lack adequate shelter from climatic conditions to meet basic needs.

Objective: Supply adequate shelter to meet grazing livestock needs.

Analysis within CART:

Crop (grazed), Forest, Range, Pasture, Farmstead, Developed Land, Associate Agriculture Land, Other Rural Land

The planner will identify this resource concern based on site-specific conditions. A threshold value of 50 will be set and existing condition questions will be triggered. The existing condition question will set the existing score as seen in Table 183.

Table 183: *Inadequate Livestock Shelter Existing Condition*

Answer	Existing Condition Points
Not assessed	-1
Not applicable	0
Livestock are adapted to local climatic conditions and do not require additional shelter	60
Livestock have adequate shelter (artificial or natural)	51
Production goals are not being met due to livestock stresses caused by local climatic conditions or lack of shelter	20
Production goals not being met due to livestock death or stresses caused by local climatic conditions or lack of shelter	1

Inadequate Livestock Water Quantity, Quality and Distribution

Component: Inadequate livestock water quantity, quality and distribution

Description: Quantity and quality of drinking water are insufficient to meet basic needs for the kind and class of livestock and improper distribution negatively impacts other resources.

Objective: Supply adequate quantity and quality of water to meet basic livestock needs and assure proper distribution to reduce negative impacts to other resources. ***Lack** of adequate water in **any grazed portion** of the PLU creates this resource concern.

Analysis within CART:

Crop (grazed), Forest (grazed), Range, Pasture, Farmstead

The planner will identify this resource concern based on site-specific conditions. A threshold value of 50 will be set and existing condition questions will be triggered. The existing condition questions will set the existing score as seen in Table *184*.

Table 184: *Inadequate Livestock Water Existing Condition (Quality, Quantity, and Distribution)*

Answer	Existing Condition Points
Not assessed	-1
Not applicable	0
Three livestock water factors met	51

Two livestock water factors met	40
One livestock water factor met	20
No livestock water factors met	1

Energy

Energy Efficiency of Equipment and Facilities

Component: Energy efficiency of equipment and facilities

Description: Stationary equipment or facilities are using energy inefficiently.

Objective: Improve energy efficiency of stationary equipment and facilities to reduce energy use.

Analysis within CART:

Any Land Use

Each PLU will default to a "not assessed" status for Energy efficiency - equipment and facilities. The planner may identify this resource concern based on site-specific conditions. The planner will have the option to identify what type of buildings are on the PLU.

Table 185*: What type of buildings are on the PLU?*

Answer
Dairy
Swine
Poultry
Maple
Greenhouse

A threshold value of 50 will be set and existing condition question will be triggered as seen in Table 186.

Refer to appendices for an overview of CART relative to non-CART tools and methods typically used to assess and address energy resource concerns.

Table 186*: Resource Concern Risk Categories for Inefficient Energy Use - Equipment and Facilities*

Note: What is the risk of Inefficient Energy Use for Equipment and Facilities as determined by the EUI-CART Converter tool?

Answer	Existing Condition Points	Reference for Assessment Condition
Not assessed	-1	
Not applicable	0	Does not apply; no appreciable amount of supplemental energy is used for agricultural operations under typical conditions.
Low	51	Energy use is appropriately managed and the potential for a Resource Concern is negligible. The agricultural operations present a minimal risk of energy resource concerns.
Moderate	40	Energy use is controlled well. A Resource Concern exists to a moderate degree.
High	25	Energy use is marginally controlled. A Resource Concern exists to a high degree.
Severe	15	Energy use is poorly controlled. A Resource Concern exists to a severe degree and merits priority.
Extreme	1	Energy use is effectively uncontrolled. A Resource Concern exists to an extreme degree and merits elevated priority.

Energy Efficiency of Farming/Ranching Practices and Field Operations

Component: Energy efficiency of farming/ranching practices and field operations

Description: Mobile on-farm, ranching, forestry, or field operations are using energy inefficiently.

Objective: Improve energy efficiency of mobile farming, ranching, forestry practices and field operations to reduce energy use.

Analysis within CART:

Crop, Forest, Range, Pasture, Farmstead

Each PLU will default to a "not assessed" status for energy efficiency - farming/ranching practices and field operations. The planner may identify this resource concern based on site-specific conditions. A threshold value of 50 will be set and existing condition question will be triggered. CART will present this question about existing conditions to a user as seen in Table 187.

Refer to appendices for an overview of CART relative to non-CART tools and methods typically used to assess and address energy resource concerns.

Table 187*: Energy Use Intensity for Energy Resource Concern Risk Categories for Inefficiency – Farming/Ranching Practices and Field Operations*

Note: What is the risk of Inefficient Energy Use for Farming/Ranching Practices and Field Operations as determined by the EUI-CART Converter tool?

Answer	Existing Condition Points	Reference for Assessment Condition
Not assessed	-1	
Not applicable	0	Does not apply; no appreciable amount of supplemental energy is used for agricultural operations under typical conditions.
Low	51	Energy use is appropriately managed and the potential for a Resource Concern is negligible. The agricultural operations present a minimal risk of energy resource concerns.
Moderate	40	Energy use is controlled well. A Resource Concern exists to a moderate degree.
High	25	Energy use is marginally controlled. A Resource Concern exists to a high degree.
Severe	15	Energy use is poorly controlled. A Resource Concern exists to a severe degree and merits priority.
Extreme	1	Energy use is effectively uncontrolled. A Resource Concern exists to an extreme degree and merits elevated priority.

Appendices

Appendix A: Acronyms

AgEMP	Agriculture Energy Management Plan
BSMPs	Basic Smoke Management Practices
Btu	British Thermal Unit (normalized energy inputs)
CART	Conservation Assessment Ranking Tool
CEAP	Conservation Effects Assessment Program
CNMPS	Conservation Nutrient Management Plans
CPDES	Conservation Practice Data Entry System
CPPE	Conservation Practice Physical Effects
EE	Energy Efficiency (when used in the context of energy conservation)
EPA	Environmental Protection Agency
ESD	Ecological Site Description
EUI	Energy Use Index/Indices
FEMA	Federal Emergency Management Agency
FIRI	Farm Irrigation Rating Index
FOTG	Field Office Technical Guide
HPS	High-Pressure Sodium
HVLS	High-Volume Low-Speed
IIRH	Interpreting Indicators of Rangeland Health
NAQSAT	National Air Quality Site Assessment Tool
NOx	Nitrogen Oxides
NRCS	Natural Resources Conservation Service
NRT	NRCS Reference Tables
PCS	Pasture Condition Score Sheet
PM	Particulate Matter
PLU	Planned Land Unit
RC	Resource Concern
RHR	Refrigerant Heat Recovery
SCI	Soil Conditioning Index
STIR	Soil Tillage Intensity Rating
SSURGO	NRCS published soils database
SVAP	Stream Visual Assessment Protocol
T/E	Threatened/Endangered Species
USDA	U.S. Department of Agriculture
VER	Ventilation Efficiency Ratio (typically rendered as CFM/W or CFM/HP)
VFD	Variable Frequency Drive (see ASD, VSD)
VOC	Volatile Organic Compounds
VSD	Variable Speed Drive (see ASD, VFD)
WHEG	Wildlife Habitat Evaluation Guide

Appendix B: Glossary

Answer Choice: The outcome of a question that results in the assignment of points for the assessment or ranking score.

Client: An individual, business, group, or unit of government that is the recipient of NRCS technical and financial assistance. NRCS clients generally fall into two broad categories: individual owners, managers, partners or businesses, with primary responsibility for their business dealings with NRCS, and groups or local sponsoring organizations or other government officials, responsible for fulfilling requirements or exercising judgments consistent with law, Executive order, and established Federal policy. Examples of the first group include persons, groups, Tribes, corporations, and organizations. Examples of the second group include conservation districts and units of government.

Conservation: The use and management of natural resources according to principles and practices that assure their sustained productivity.

Conservation Plan: A record of the client's decisions and supporting information for treatment of a unit of land for one or more identified natural resource concerns as a result of the planning process. The plan describes the schedule of implementation for practices and activities needed to solve identified natural resource concerns and takes advantage of opportunities. The needs of the client, the resources, and Federal, State, Tribal, and local requirements will be met.

Conservation Planning: The activity of NRCS and others in helping a client use the planning process, which is intended to result in a conservation plan or an areawide conservation plan.

Conservation Practice: A specific treatment, such as a structural or vegetative measure, or management technique, commonly used to meet specific needs in planning and implementing conservation, for which standards and specifications have been developed. Conservation practices are contained in the FOTG, Section IV, which is based on the National Handbook of Conservation Practices (NHCP).

Existing Condition: The pre-planning condition of a planning area that is used as a point of reference to measure changes in resource conditions resulting from conservation treatment. The existing condition is a statement of the identified resource concerns, special environmental concerns, current management and existing conservation practices.

Existing Condition Points: The values assigned to credit the underlying management system that is currently in place. These Existing Condition points are added to Practice Points for each of the existing practices. That sum is compared to management thresholds assigned by CART Assessment modules to evaluate the management system's adequacy for the level of site risk.

Existing Practices: Existing conservation practices included in the current management system for the planning unit. These practices meet NRCS standards and specifications.

Field Office Technical Guide: The official NRCS guidelines, criteria, and standards for planning and applying conservation treatments (450-GM, Part 401).

Geospatial: Pertaining to the geographic location and characteristics of natural or constructed features and boundaries on, above, or below the earth's surface; especially referring to data that is geographic and spatial in nature.

NRCS Reference Tables: NRT - NRCS maintains a database of common domains, called the NRCS Reference Tables (NRT), which NRCS applications access. The system works such that when a value is added or changed in the NRT, all applications will get the change simultaneously.

The NRT is designed to reduce the *stove-piping* of systems among the many NRCS applications, domains are shared across systems to provide commonality. As an example, a practice code in one system is the same practice code found in another system. This allows data to be compared across systems using a domain value as a common key. The CPDES web-based application is designed to manage domain data and relationships entered by NRCS national and state data stewards. It then publishes the resulting information to the NRCS Reference Tables (NRT) for consumption by NRCS systems. The data managed by CPDES includes information regarding practice standards, resource concerns and conservation assessment practice points for individual practices and resource concern components.

Planned Practices: Additional conservation practices that are not currently included in the management system but are being evaluated for implementation.

Planner: A person, qualified by training and experience, who effectively assists the client in completing the planning process.

Planner Override: When a planner can identify through observation or other assessment method that planning criteria has or has not been met, but may be outside or improperly recognized using the streamlined CART questions, information, and analysis framework designed to capture typical conditions.

Planning Criteria: A quantitative or qualitative statement of the minimum level of treatment required to address a given resource concern for a particular land area. It is established in accordance with local, State, Tribal, territorial, and Federal programs and regulations in consideration of ecological, economic, and social effects.

Planning Land Unit: A PLU is a unique geographic area, defined by a polygon, that has common land use and is owned, operated, or managed by the same client or clients. The PLU is the minimum unit for planning.

Practice Points: The value assigned to an individual practice and resource concern component that credits the effect of the practice on the resource concern component. Practice Points can apply to the Existing Condition or be planned to address a management system's inadequacy for the level of site risk.

Priorities: Other priorities to consider (ex. Critical watershed or wildlife habitat) which are used in ranking.

Question: A text sentence or geospatial expression used to elicit a result equal to an associated choice.

Site Vulnerability: Level of risk present on a PLU for identified resource concern(s).

Supplemental Energy: Resources used to meet energy needs beyond sunlight.

Supporting Practice: (Also known as a Facilitating Practice) A conservation practice that facilitates management or the function of another practice, or both, but does not achieve the desired effects on its own. Example: A fence is a facilitating practice for prescribed grazing. Prescribed grazing helps improve forage for livestock.

Resource Concern: The resource condition that does not meet minimum acceptable condition levels as established by resource planning criteria shown in the FOTG, Section III. This implies an expected degradation of the soil, water, air, plant, animal or energy resource base to the extent that the sustainability or intended use of the resource is impaired. Because NRCS quantifies or describes resource concerns as part of a comprehensive conservation planning process, that includes client objectives, human factors are considered components of the resource base.

An example resource concern is “nutrients transported to surface water”.

Resource Concern Category: Used to organize resource concerns into groups that have functional similarities. For example, “Field Sediment, nutrient and pathogen loss” is the resource concern category for the following resource concerns: nutrients transported to surface water, nutrients transported to groundwater, pathogens and chemicals from manure, biosolids, or compost applications transported to surface water, pathogens and chemicals from manure, biosolids, or compost applications in groundwater, and sediment transported to surface water.

Resource Concern Component: For planning purposes, some resource concerns are divided into components where there is a clear distinction in the causal factors, the mitigating actions, and the anticipated environmental effect. For example, “Nonpoint nitrogen surface loss” and “Nonpoint phosphorus surface loss” are both components of the resource concern “nutrients transported to surface water”.

Threshold: Measure of intrinsic site vulnerability and amount of conservation effort to reach a “sustainable” level. Thresholds may be normalized at 50 points but are representative of NRCS planning criteria.

Appendix C: CART Soil Data Access Web Services

Link to view documentation: https://jneme910.github.io/CART/

Appendix D.1: CART energy module and interaction with off-CART tools

CART v1 provides a limited analysis of energy resource concerns and possible practices to mitigate negative benchmark conditions. CART v1 operates within a comprehensive, streamlined methodology to perform these parts of the nine-step planning process at a high cut:

- Step 1, Identify Problems & Opportunities
- Step 2, Determine Objectives
- Step 3, Inventory Resources
- Step 4, Analyze Resources
- Step 6, Evaluate Alternatives
- Step 7, Make Decisions

In the future, CART is expected to incorporate many of the functions initially provided by off-CART tools. More details are pending final design and launch of CART. The streamlined process supported by CART and the off-CART tools assists a planner with these actions:

- Estimate the energy use intensity of a client's principal enterprises.
- Prioritize the order of follow up to address higher-risk energy resource concerns.
- Assess equipment, systems, and management decisions that determine the client's energy use intensity.
- Identify well-proven practices, eligible for rapid contract action, to increase the energy efficiency of the client's operations and reduce energy use.

CART will reduce the administrative burden on planners (and clients) imposed by existing protocols. CART functions will be leveraged through an expanded set of off-CART tools. Together, the revised protocols and tools will simplify nine-step planning for energy resource concerns. The full CART rollout will allow NRCS planners to more quickly and effectively deliver energy conservation based on customer need and interest.

See appendix D.4 for step-by-step process to assess energy using CART and off-CART tools.

Appendix D.2: CART Data Fields

Planner acquires two sets of data to assess the CART existing condition points value.

1. Energy input data, per Table 188
2. Primary, relevant enterprises data, per Table 189

Note that an NRCS agricultural energy management plan (AgEMP) will generally include the data needed for these tables.

See appendix D.4 for a step-by-step overview of the process to assess energy concerns with CART.

Table 188: *Annual Energy Input Data Table*

Category [A]	Budget ($/yr) [B]	Est. Quantity (Units) [B]		Type	Notes
Diesel Fuel			gal/yr	n/a	

Category [A]	Budget ($/yr) [B]	Est. Quantity (Units) [B]		Type	Notes
Nitrogen Fertilizer			Lb/yr		[1]
Electricity			kWh/yr	n/a	
Propane			gal/yr	n/a	
Natural Gas			Varies	n/a	[2]
Purchases to be determined			Varies		[3]
Onsite Generation			kWh/yr		[4]
Onsite Renewable Heat			Varies		[5]

Table Notes

- Expand rows to accommodate multiple energy resources for onsite generation, heat sources, or allocate a specific resource to two or more distinct parts of the operation (see note [A]).
- Take notes of contracted work (e.g., harvesting) that includes fuel used and purchased by others. That can help resolve problems with energy balance or indicate conditions that can't be handled in CART v1.

[A] Record cases where individual electric meters, multiple propane tanks, or other energy purchases can be more closely linked to a specific part of the operation.
- Irrigation pumps, residences, farm offices, or groups of farm buildings (e.g., farm stands or stores) may have independent electric meters.
- Note where electric service meters or fuel sources (e.g., propane or diesel tank) include any residential dwellings. (The tools use this to isolate enterprise energy use from residential structures.)

[B] Estimated budget serves as a minimum data tier to proceed with CART. Estimated purchase quantities, if available, improves accuracy.
- An annual budget estimate is good enough to use the EUI-CART converter. A planner might ask, "About how much do you budget for diesel every year?"
- Some producers will track actual energy purchases.
- Collect both cost and energy values when possible to reduce errors in downstream analysis.
- Three significant digits are typically adequate for budget or quantity values.
  - Two digits is fine for values below 1,000.

[1] Record use of green or animal manures if more than a marginal contributor of fertilizer. (For purposes of CART and the EUI-CART converter, consider a contribution of less than 10% from non-synthetic fertilizers as "marginal.")

[2] Record natural gas units of purchase that apply to the producer. The standard unit of sale varies by location. Refer to the EUI-CART Converter User Guide for further detail.

[3] Allows entries for less typical energy sources.

[4] Onsite generation is recorded to learn if renewable resources (biogas, PV, wind, hydro, etc.) and/or fossil-resources (diesel, propane, etc.) support farm operations on a regular and substantive basis.
- Infrequent use of emergency generators can be ignored.
- A planner might ask, "About how many days a year do you use the generator?"
- Further analysis may be required to resolve issues related to onsite generation.

[5] Onsite RR heat is recorded to learn if biogas, wood, solar, or other renewable resources are used to provide onsite heat. (See note [4] for methods to assess this use.)

Table 189: *Primary, Relevant Enterprises Data Table*

Enterprise Categories [A]				Scale of Operation			
#	**Primary**	**Secondary**	**Condition**	**Value**	**Unit**	**Type**	**Notes**

The planner uses the data to derive the existing condition points value with the EIU-CART converter.

CART methodology establishes risk categories shown in the energy use intensity in Table 186 and Table 187.

Draft structure of underlying CART data tables are shown in Table 190 and Table 191.

Table 190: *CART Data Exported to EUI-CART Converter*

Item	Description	Intake Set
1	Unique Customer ID	Core
2	Enterprise Data	Enterprise Data
3	Energy Input Data	Energy Input Data Table

Table 191: *Enterprise Data Fields*

Item	Description	Entry	Unit	Note
1	Enterprise Category	Drop-Down	N/A	Enterprise Data
2	Enterprise Subcategory	Drop-Down	N/A	Enterprise Data

3	Scale (Size Basis)	Value	Varies	Energy Input Data
4	Scale (Production Basis)	Value	Varies	

Future CART updates are anticipated is configured to provide SME administrator rights to create items, noted below, to maintain functions aligned with field needs.

- Enterprise category and subcategory classes.
- Associated scale (size and / or production) fields.
- Energy input data resource type fields.

Programming to support related entry fields to supplement as-yet-undefined core or primary data (whether drawn from GIS, derived from similar data set, or producer-provided) will be part of a continuous improvement strategy.

Appendix D.3: CART Process to Assess Energy Concerns, Step-by-Step

A. Planner collects basic information to estimate EUI for applicable enterprises.
    1. This information is intended to be approximate, annual values based on typical, expected conditions. Typical conditions include normal weather and markets, an absence of avian flu or similar illness, or other events that disrupt usual operations. (See EUI-CART converter for other details.)
    2. Ask if the producer has a previously completed energy analysis related to the PLU being evaluated. (The analysis may be an NRCS CAP 128, *Agricultural Energy Management Plan* or similar report from USDA-RD, an electric or natural gas utility, State energy office, conservation district, or others.)
        - The CAP 128 plan criteria require the primary energy input data needed. Other studies will typically have this data also.
        - Be aware that an acceptable analysis may be tagged with a variety of names: audit, assessment, report, etc. The scope or quality of the content cannot be reliably predicted by the title of the document.
        - Find out if the operation associated with the PLU is significantly different than when the energy analysis was done.
            - See item A.1. and confirm that any analysis reflected “typical, expected” conditions.
            - Generally, operations that remain within about 15 percent of scope or scale of production when evaluated will not require updated information.
            - Talk a bit further with the producer if, for example, the energy analysis looked at a 200-cow dairy herd that has grown by more than about 40 cows. (At a more detailed level, if the producer indicates that milk yield

has changed more about 15 percent due to a change in the herd size combined with a different feed regime.)

- Find out if the producer plans to modify operations in the near-term (next year or two) in similarly substantive way. (In order to plan for future conditions rather than the past.)

3. If no energy study is available, or some gaps remain, ask about the producer's approximate, annual energy inputs to complete Table 188.
    - Refer to Table 188 notes about individual electric meters, residential dwellings, and other details to record that improve the analysis of energy concerns and potential practices to address identified concerns appropriately.
4. Ask the producer about their most important enterprises, crops, or other operations.
    - Learn about the producer's objectives and priorities in terms of principal crops or livestock to complete Table 189.
    - As with energy input, the planner will need details at an order of magnitude to understand what matters most to the producer.
5. Planner enters the enterprise and energy input data into CART.

Table 192: *Description for Energy Resource Concerns*

Resource Concern	Description of Concern	Land Use
Energy efficiency of equipment and facilities.	Stationary equipment or facilities are using energy inefficiently.	Any
Energy efficiency of farming and ranching practices and field operations.	Mobile on-farm, ranching, forestry or field operations are using energy inefficiently.	Crop Forest Range Pasture Farmstead

Draft language, as follows, has been considered to clarify the terms used in each description.

> Stationary equipment is typically fixed in place for long-term use (many months or years). A variety of farm equipment (e.g., tractors, irrigation systems) may be moved for use in multiple locations but may be operated with a fixed position when in use. This equipment is typically kept in a fixed location for shorter-term use (many hours, days, or weeks) but falls into "equipment and facilities" for that use category relative to the farm operation.
>
> In contrast, "mobile equipment" related to field operations refers to equipment that is not constrained to a fixed position when in use.
>
> Which energy resource concern applies is based on the operation under review. A given piece of equipment may be evaluated for both energy concerns under different circumstances.

A tractor parked to drive an irrigation pump with the PTO is evaluated as “equipment and facilities.” A tractor (in motion) used to till, fertilize, harvest, etc. is evaluated as “field operations.”

Appendix D.4: Energy Planning Criteria - Equipment and Systems Indicators & Thresholds

Work remains in process to develop various indicator and performance metric thresholds based on distinct types of energy-using equipment and systems. These indicators and thresholds will assist NRCS to more quickly and effectively identify and implement practices to address energy concerns.