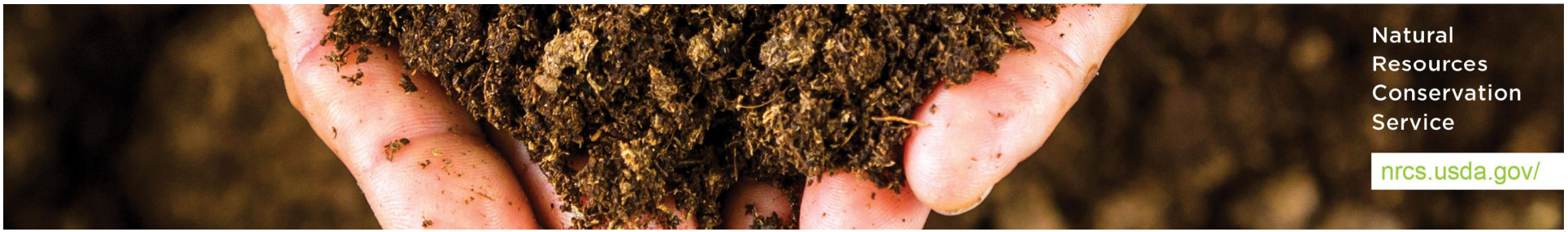
United States Department of Agriculture

CART

Conservation Assessment & Ranking Tool

Conservation Planning and Ranking

February 2019



Conservation Planning

1. Identify Problems and Opportunities
2. Determine Objectives
3. Inventory Resources
4. Analyze Resource Data
5. Formulate Alternatives
6. Evaluate Alternatives
7. Make Decisions
8. Implement Plan
9. Evaluate the Plan

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How does CART work? => Integrating IT

Phase I

Collect & Analyze

- Identify Problem
- Determine Objective
- Inventory Resources
- Analyze Resource Data

Phase II

Decision Support

- Formulate Alternatives
- Evaluate Alternatives
- Make Decision

Phase III

Implementation & Evaluation

- Implementation Requirements
- Implement the Plan
- Evaluate the Plan

Conservation Desktop — Future

Conservation Assessment Ranking Tool

Environmental Assessment

Protracts

Funds Manager

Resource Concerns
Planning Criteria (Threshold)
Existing Conditions

Conservation Plan

CAPS – Resource Assessment

Conservation Practices
Economics

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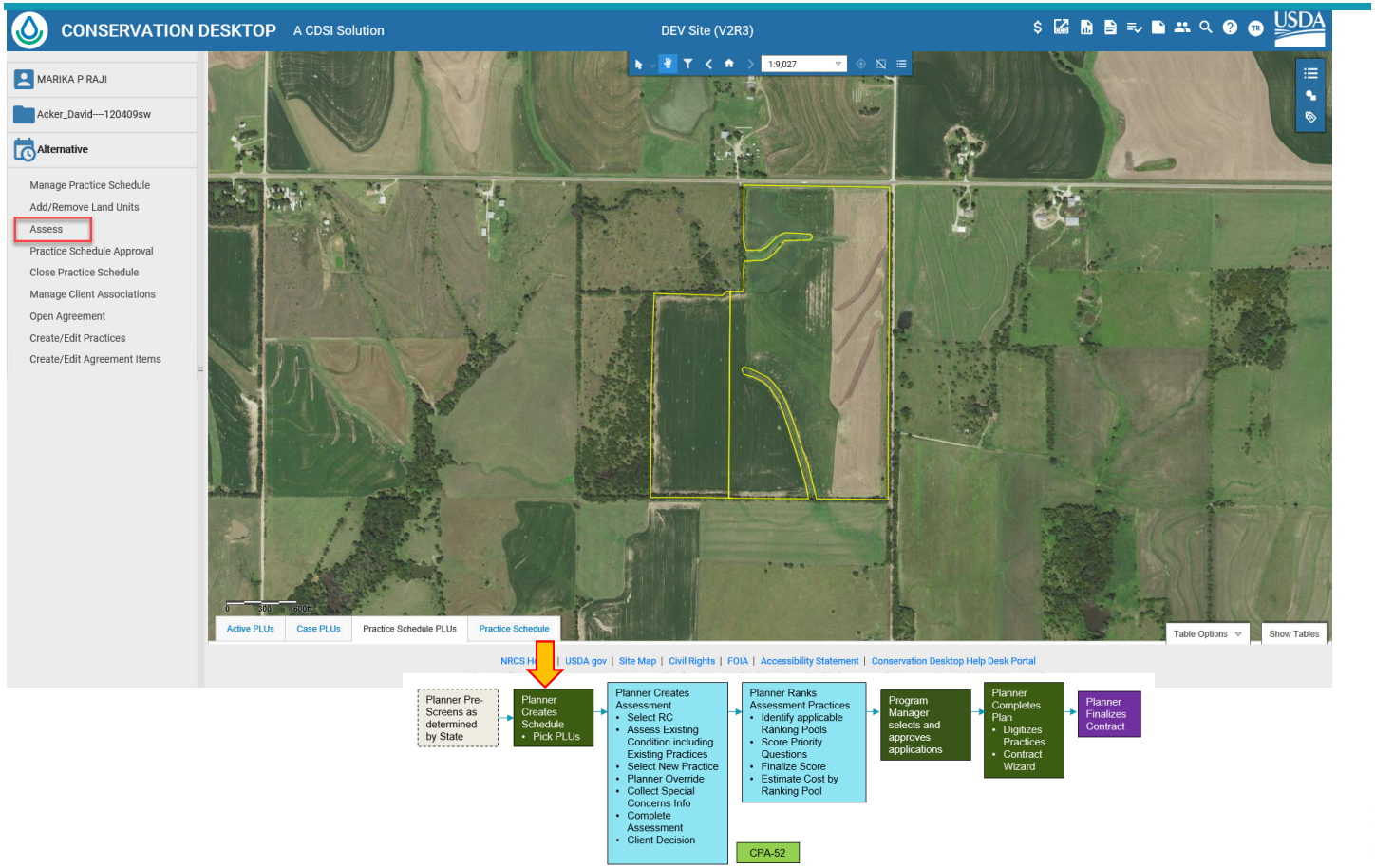
How does CART Work?



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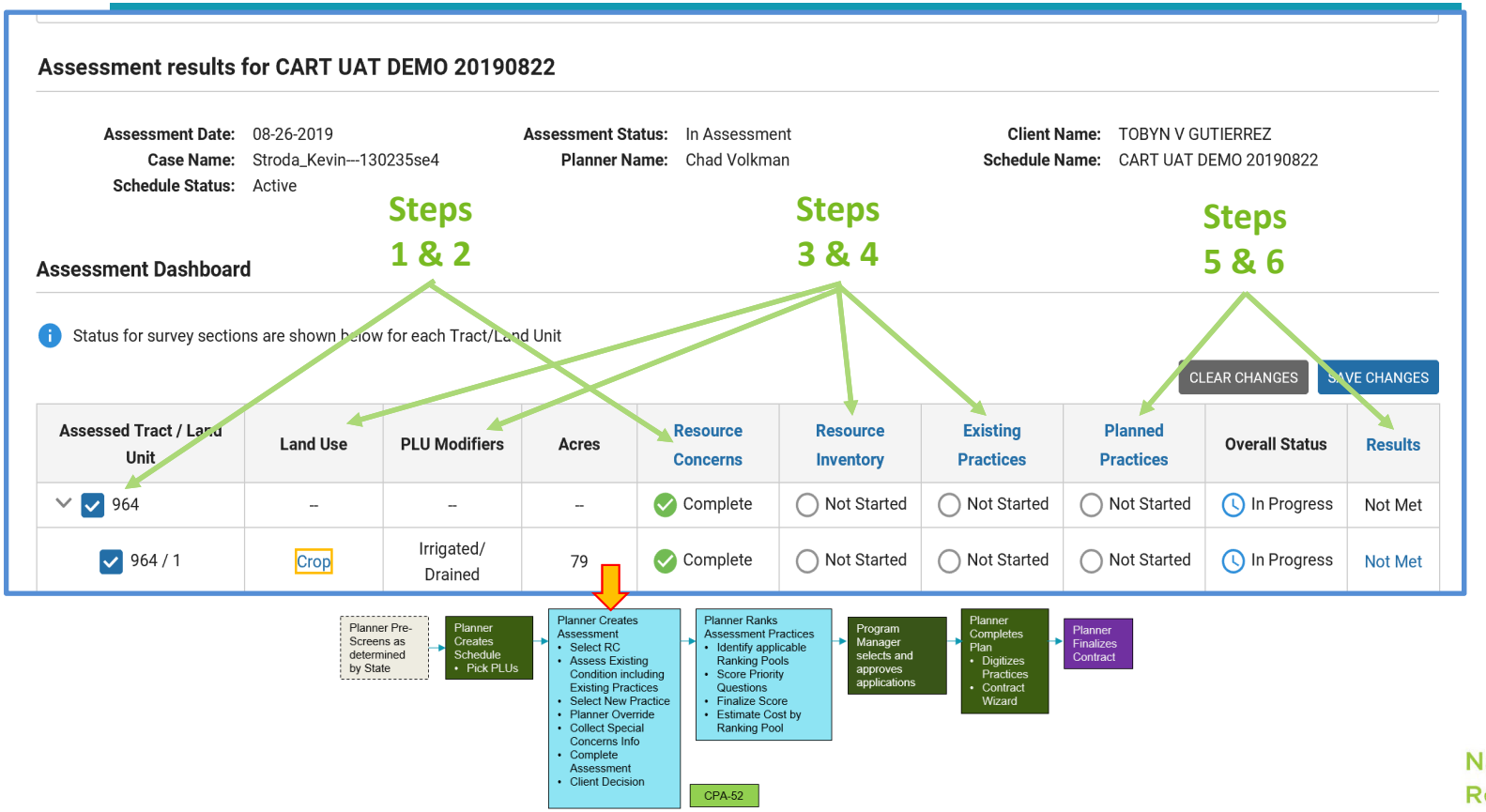
How does CART Work? – Planning Steps



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How does CART work? => Steps 1 and 2

Soil Erosion – Sheet and Rill – Threshold

Geospatially Calculated 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

Results for Land Unit

Resource Concerns	Components	Existing Conditions	Existing Practices	Existing Total	Planned Practices	Plan Total	Threshold
Sheet and rill erosion	Sheet and rill erosion	0	0	0	0	0	40

How does CART work? => Steps 3 and 4

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

Soil Erosion – Sheet and Rill – Existing Conditions

Results for Land Unit

Resource Concerns	Components	Existing Conditions	Existing Practices	Existing Total	Planned Practices	Plan Total	Threshold
Sheet and rill erosion	Sheet and rill erosion	5	0	5	0	5	40

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How does CART work? => Steps 3 and 4

Soil Erosion – Sheet and Rill – Existing Practices

Conservation Practices	Conservation Practice Points
Conservation Crop Rotation (328)	10
Contour Farming (330)	5
Cover Crop (340)	15
Residue and Tillage Management, No-Till (329)	20
Residue and Tillage Management, Reduced Till (345)	15
Stripcropping (585)	5
Terrace (600)	15

Results for Land Unit

Resource Concerns	Components	Existing Conditions	Existing Practices	Existing Total	Planned Practices	Plan Total	Threshold
Sheet and rill erosion	Sheet and rill erosion	5	15	20	0	20	40

How does CART work? => Steps 5 and 6

Soil Erosion – Sheet and Rill – Planned Practice

Conservation Practices	Conservation Practice Points
Conservation Crop Rotation (328)	10
Contour Farming (330)	5
Cover Crop (340)	15
Residue and Tillage Management, No-Till (329)	20
Residue and Tillage Management, Reduced Till (345)	15
Stripcropping (585)	5
Terrace (600)	15

Results for Land Unit

Resource Concerns	Components	Existing Conditions	Existing Practices	Existing Total	Planned Practices	Plan Total	Threshold
Sheet and rill erosion	Sheet and rill erosion	5	15	20	30	50	40

How does CART work? – Steps 1 and 2

Concentrated Erosion – Classic Gully Erosion - Threshold

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.

Results for Land Unit

Resource Concerns	Components	Existing Conditions	Existing Practices	Existing Total	Planned Practices	Plan Total	Threshold
Classic gully erosion	Classic gully erosion	0	0	0	0	0	50

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How does CART work? – Steps 3 and 4

Concentrated Erosion – Classic Gully Erosion – Existing Conditions

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

Results for Land Unit

Resource Concerns	Components	Existing Conditions	Existing Practices	Existing Total	Planned Practices	Plan Total	Threshold
Classic gully erosion	Classic gully erosion	1	0	1	0	1	50

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How does CART work – Steps 3 and 4?

Concentrated Erosion – Classic Gully Erosion – Existing Practices

No Observed Existing Practice = 0

Results for Land Unit

Resource Concerns	Components	Existing Conditions	Existing Practices	Existing Total	Planned Practices	Plan Total	Threshold
Classic gully erosion	Classic gully erosion	1	0	1	0	1	50

How does CART work – Steps 5 and 6?

Concentrated Erosion – Classic Gully Erosion – Planned Practices

Conservation Practices	Conservation Practice Points
Grassed Waterway (412)	50
Water and Sediment Control Basin (638)	50

Results for Land Unit

Resource Concerns	Components	Existing Conditions	Existing Practices	Existing Total	Planned Practices	Plan Total	Threshold
Classic gully erosion	Classic gully erosion	1	0	1	50	51	50

*Supporting practices may be necessary to support the above practices, and will be identified as necessary supporting practices, but do not add conservation practice points to the planned practices total.

How does CART work? – Steps 1 and 2

Plant Degradation – Plant Structure and Composition – Range-Threshold

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

Results for Land Unit

Resource Concerns	Components	Existing Conditions	Existing Practices	Existing Total	Planned Practices	Plan Total	Threshold
Plant structure and composition	Plant structure and composition	0	0	0	0	0	50

How does CART work – Steps 3 and 4?

Plant Degradation – Plant Structure and Composition - Range Existing Conditions

Answer	Existing Condition Points	Reference for assessment condition
None to Slight	60	Interpreting Indicators of Rangeland Health (IIRH) biotic integrity attribute rating of none to slight
Slight to Moderate	51	IIRH biotic integrity attribute rating of slight to moderate
Moderate	20	IIRH biotic integrity attribute rating of moderate

Results for Land Unit

Resource Concerns	Components	Existing Conditions	Existing Practices	Existing Total	Planned Practices	Plan Total	Threshold
Plant structure and composition	Plant structure and composition	51	0	51	0	51	50

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How does CART work? – Steps 5 and 6

Plant Degradation – Plant Structure and Composition - Range
Existing & Planned Practices

Conservation Practices	Conservation Practice Points
Brush Management (314)	30
Herbaceous Weed Treatment (603)	30
Prescribed Grazing (528)	30
Grazing land Mechanical Treatment (548)	15
Prescribed Burn (338)	30

Results for Land Unit

Resource Concerns	Components	Existing Conditions	Existing Practices	Existing Total	Planned Practices	Plan Total	Threshold
Plant structure and composition	Plant structure and composition	51	0	51	30	81	50

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How does CART work? – Overrides

My Assessment 12342345 - BARBER COMPANY FARMS

Select a different PLU below to see its assessment results for this Assessment

Results to show: Land Unit 10 Tract 399 (met)

When the Plan Total numeric value is lower than the Threshold value, CART displays orange warning icons in the Existing Total and Plan Total columns to indicate the threshold was "Not Met" per the standard code calculations.

Results for Land Unit 10 (Tract 399)

Resource Concerns	Components	Existing Conditions	Existing Practices	Existing Total	Planned Practices	Plan Total	Threshold	Actions
Soil Erosion	Sheet, rill, and wind erosion	25	25	50	5	55	50	⋮
	Concentrated flow	25	26	51	6	57	50	⋮
	Excessive bank erosion from streams, shorelines, or water conveyance channels	25	5	30 ⚠	2	32 ⚠	50	⋮
Organic matter depletion	Organic matter depletion	15	12	27	2	29	50	⋮

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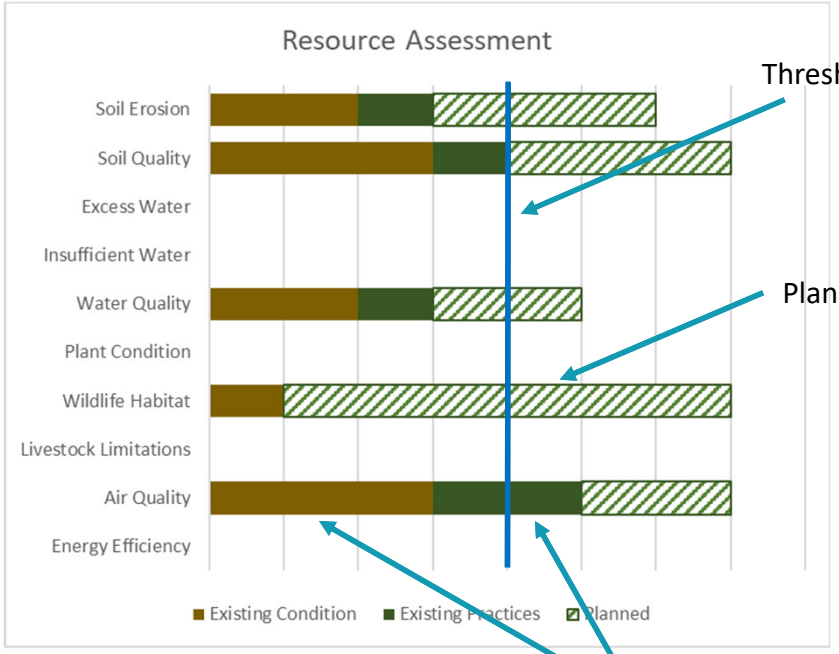
How does CART work? – Steps 3 thru 6?

CART assists planners illustrate various alternative planned practices and their effect on the resource concern.



BONUS: Ranking taking place in background

Plan Assessment Ranking Points

Ranking pools will evaluate client's applications for 5 main areas

- **Plan Assessment: Existing Vulnerability***
- **Plan Assessment: Planned Practice Effects***
- **Pool Priorities: Resource**
- **Pool Priorities: Program**
- **Efficiency**

***Information captured already in the assessment process**

NOTE:

- **Only resource concerns which are identified by the ranking pool will garner plan assessment points**
- **Only practices on land uses which are identified by the ranking pool will garner plan assessment points**

Plan Assessment Ranking Points

Threshold - Existing Condition & Practices + Planned Practice Effects

Vulnerability

Results for Land Unit

Resource Concerns	Components	Existing Conditions	Existing Practices	Existing Total	Planned Practices	Plan Total	Threshold
Sheet and rill erosion	Sheet and rill erosion	5	15	20	30	50	40

40 - 20 + 30

Vulnerability

2 **Vulnerability Pts**

30 **Planned Practices Pts**

How does CART work? => Prioritization

Resource Concern Soil Erosion – Sheet and Rill

Current Assessment Ranking Pts	AERT Priority	CART Assessment Ranking Pts	CART Priority
Flat +30 Planned Practices	1st	**Flat** 0 Vulnerability +30 Planned Practices	3rd
Gently Rolling +30 Planned Practices	1st	**Gently Rolling** 20 Vulnerability +30 Planned Practices	2nd
Steep Slope +30 Planned Practices	1st	**Steep Slope** 50 Vulnerability +30 Planned Practices	1st

Program Ranking

Local flexibility

Ranking Pool Use

Within CART each FY 2020 program Spending Plan (funding pools, subaccounts, and/or initiatives) will have a CART ranking pool.

Ranking pools will evaluate client's applications for 5 main areas

- **Plan Assessment: Existing Vulnerability**
- **Plan Assessment: Planned Practice Effects**
- **Pool Priorities: Resource**
- **Pool Priorities: Programmatic**
- **Efficiency**

The locally led process can have input on each of these

Ranking Pool Use

Each Ranking Pool will be customized by the appropriate program manager after incorporating locally led input. Customizable aspects include:

- **Geographic Extent of Ranking Pool**
- **Subdivisions for funding within Ranking Pool**
- **Weighting between 4 aspects**
- **Selection of Land Uses**
- **Selection and Weighting of Resource Concerns**
- **Selection of Conservation Practices**
- **Applicability Questions or Geometry**
- **Pool Resource Priority Questions and Geometry**
- **Pool Programmatic Priority Questions and Geometry**

Ranking Pool (Applicability)

A ranking pool will start to garner points if:

- **PLU(s) are within geographic boundary (Could have a percentage requirement of PLUs)**
- **At least one resource concern is checked to assess for a resource concern identified as positively weighted for the ranking pool**
- **Applicable Practices are in the Plan for the ranking pool**
- **Applicability Questions are passed**

CART Point Model

Resource Concern Met

Existing Condition & Practices + Planned Practice Effects > Threshold or Planner Override

EQIP Ranking Point Example

Threshold - Existing Condition & Practices + Planned Practice Effects + Resource & Programmatic Priorities

Vulnerability

Ranking Pool (Resource Concern Met)

Resource Concern Met (Existing or Planned)

Existing Condition & Practices **+** Planned Practice Effects **>** Threshold or Planner Override

Resource concern met by program and ranking pool:

- **Planner Overwrite only changed final Y/N Answer, not point**
- **May establish program eligibility, such as CSP**
- **May garner bonus resource concern points for Planned Condition Meeting Threshold**

Ranking Pool (Plan Assessment Points)

Plan Assessment points by ranking pool:

- **Plan Assessment points come from evaluating the Program Neutral Conservation Plan**
- **Only resource concerns which are identified by the ranking pool will garner plan assessment points**
- **Only practices on land uses which are identified by the ranking pool will garner plan assessment points**

Ranking Pool Weighting

Resource Priority	Weighting
Soil Erosion	20%
Soil Quality	10%
Excess Water	0%
Insufficient Water	0%
Water Quality Degradation	**40%**
Degraded Plant Condition	0%
Inadequate Habitat for Fish and Wildlife	10%
Livestock Production Limitation	0%
Inefficient Energy Use	0%
Air Quality Impacts	20%

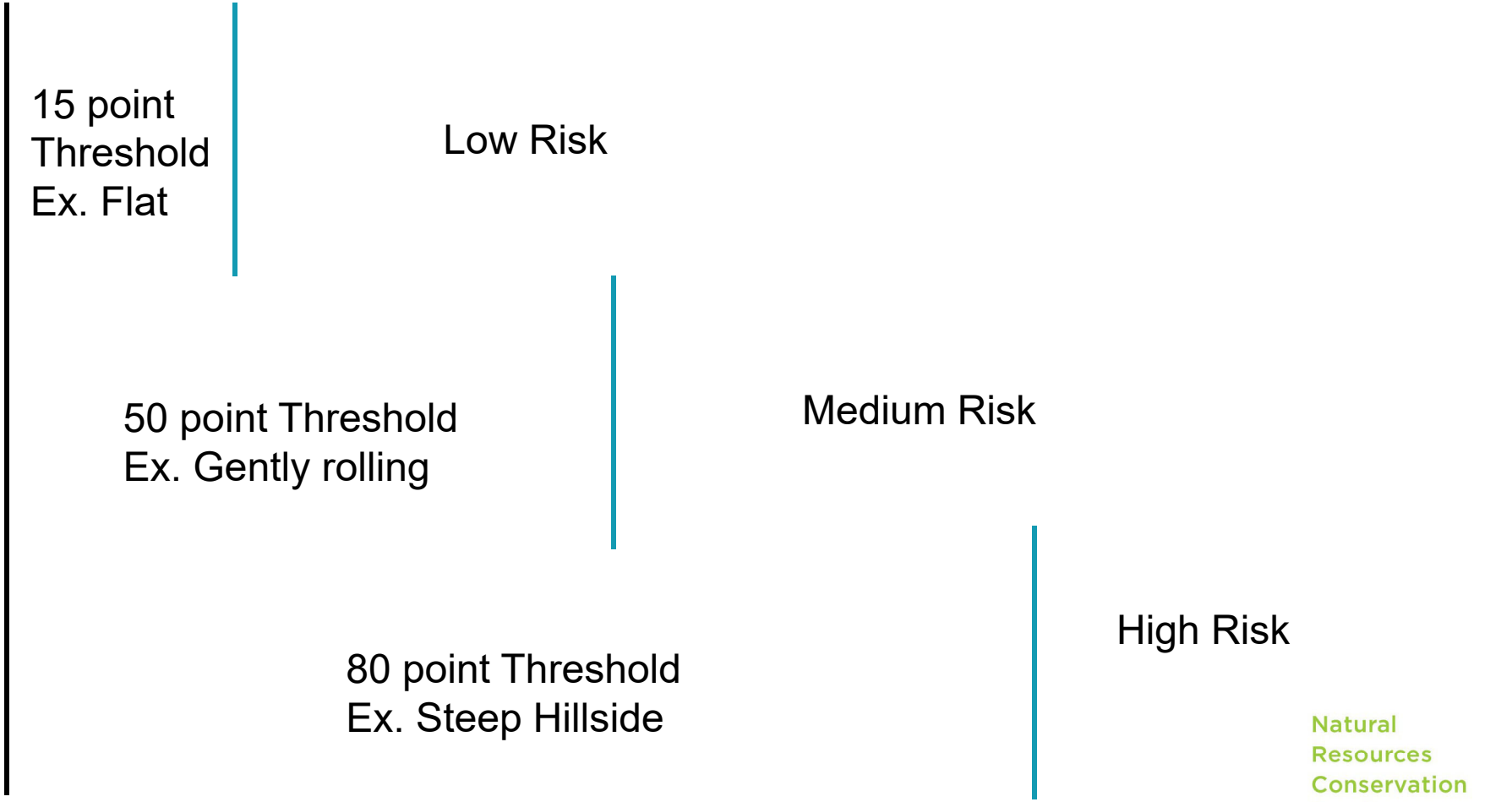
Example Weighting

Ranking Pool Weighting

Resource Priority	Resource Concern	Weighting
Water Quality		**40%**
	Nutrient Transport to Surface Water	30%
	Nutrient Transport to Groundwater	30%
	Sediment	10%
	Bank Stabilization	10%
	Pesticide Transport to Surface Water	10%
	Pesticide Transport to Groundwater	10%
	Salts	0
	Pathogens in Surface Water	0
	Pathogens in Groundwater	0
	Water Temperature	0

Example Weighting

Site Vulnerability



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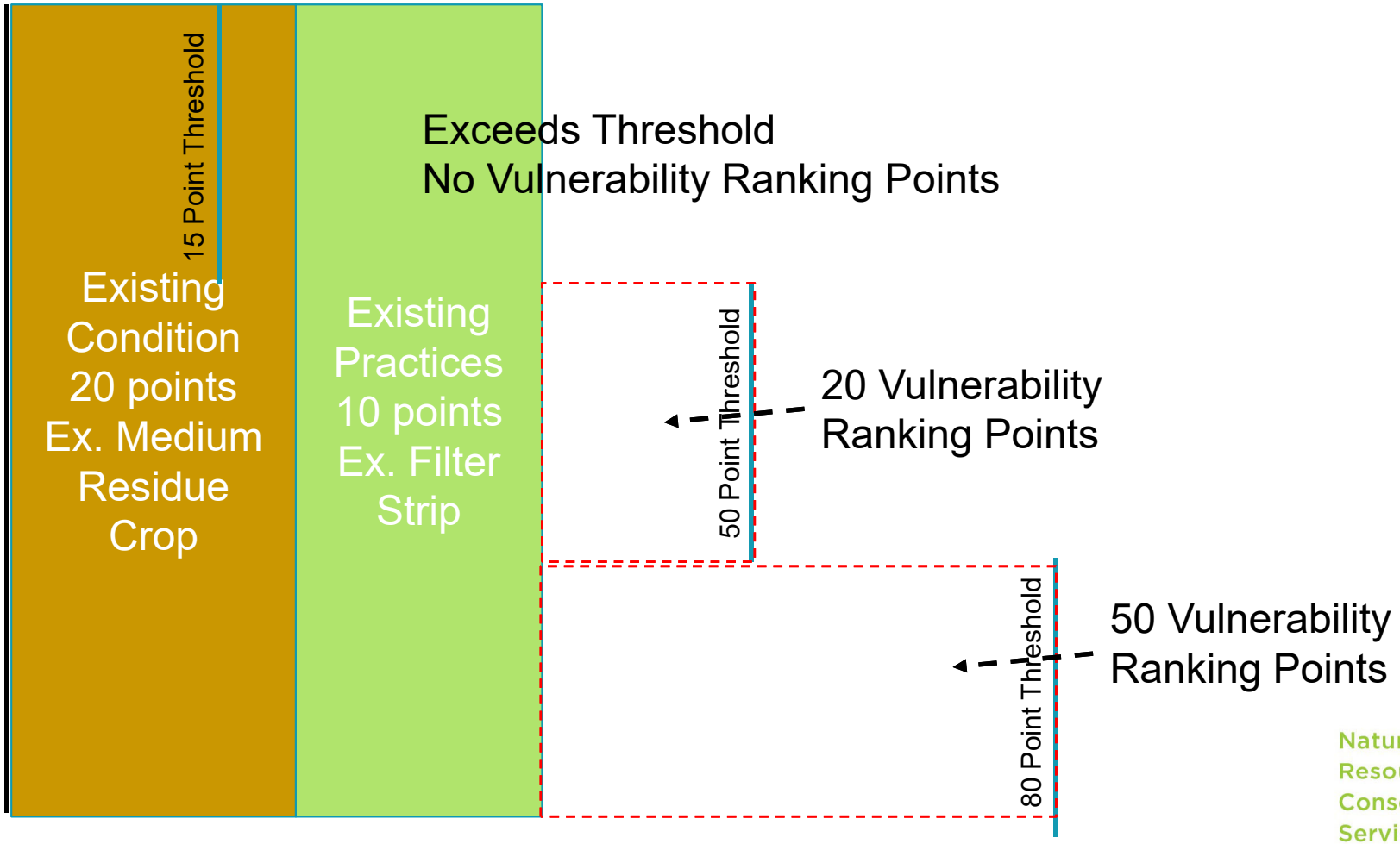
Existing Condition



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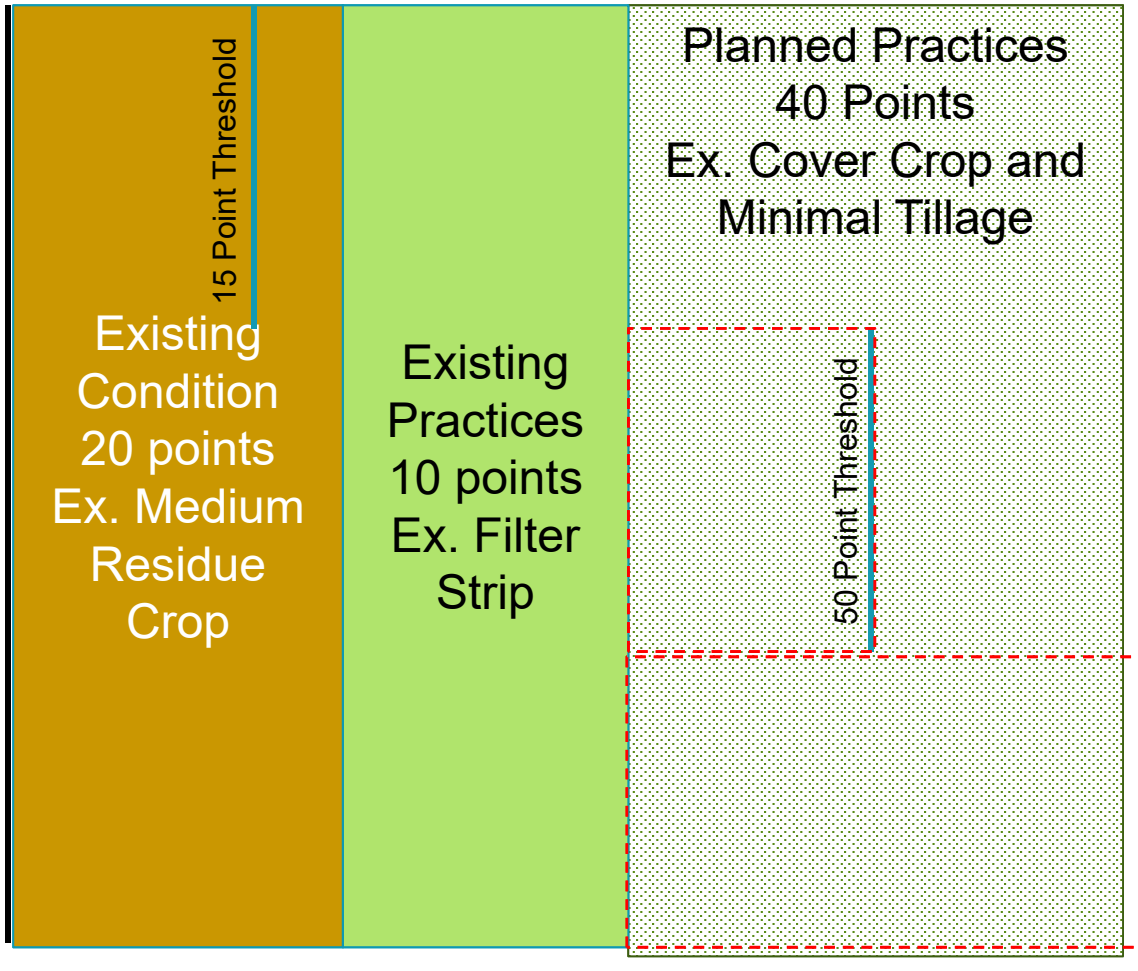
Planned Practices



0 Vulnerability
+40 Planned Practices

20 Vulnerability
+40 Planned Practices

50 Vulnerability
+40 Planned Practices

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Pool Resource Priorities

- **Resource Priorities will be Ranking Pool Specific and may be either geospatial or question based.**
  - Geospatial Based (ex. Priority Watershed)
  - Question Based (ex. Do the practices in the application affect sage grouse?)
- **Points awarded can be true/false or graded by priority**
- **Multiple priorities can be considered for each ranking pool**
- **Awarded at the application level, not by Planned Land Unit**

Pool Programmatic Priorities

- **Programmatic Priorities will be Ranking Pool Specific and may be either geospatial or question based.**
  - Geospatial Based (ex. Risk of conversion)
  - Question Based (ex. Veteran Farmer)
- **Points awarded can be true/false or graded by priority**
- **Multiple priorities can be considered for each ranking pool**
- **Awarded at the application level, not by Planned land unit and may be based on the client's status**

Efficiency

Plan Benefits from Applicable Practices

Average Annual Practice Cost

- **Weighted to result in meaningful score as identified by program**

Application Score Weighting

- **Set by ranking pool with bounds set by program**
- **Old National, State, and local questions would be incorporated into Plan Assessment or Pool Priorities**

Pool Weighting		
Plan Assessment	Vulnerability	20%
	Planned Practice Effects	30%
Pool Priorities	Resource	30%
	Programmatic	10%
Efficiency Score		10%
Application Score		100%