



Implementing Natural Climate Solutions

Oregon Agricultural Heritage Program



OREGON
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ENHANCEMENT BOARD

Agriculture in Oregon



- ~22,000 “Farms”
- 97% “Family Owned”
- Ag = 2nd Largest Land Use
- 2/3 of Ag land will change hands over the coming 2 decades

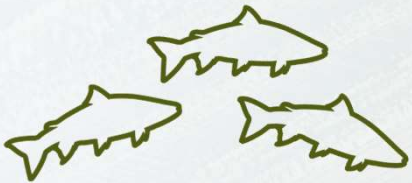


Photo: Loren Kerns, CC

Purpose



Increase the economic viability of Oregon's agricultural operations and economic sector



Enhance fish or wildlife habitat, water quality, and other natural resources on Oregon's working land



Reduce conversion and fragmentation of Oregon's "working land"

Setting Future Farmers up for Success

- ✓ Be at the Table
- ✓ Engage with Change
- ✓ Focus on “Big Picture Basics” (Food, Water, Shelter)
- ✓ Bring “Tools”
 - Stabilize and enhance the base resources for future generations
 - Facilitate transitions in land management



Grant Programs “Tools”



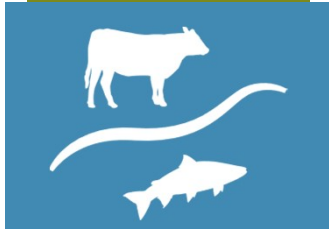
Technical Assistance
(*support human capacity)



Succession Planning
(*facilitate transitions)



Conservation Management
(*enhance resource base)



**Working Land Conservation Covenants
and Easements** (*stabilize resource base)



Natural and Working Lands Fund:

- ✓ \$750,000 (OAHP) + \$1,500,000 (“Open Solicitation”) to OWEB to provide grants to projects that have carbon sequestration and greenhouse gas emissions reduction benefits
- ✓ 2024 = Public Engagement Process
- ✓ 2025 (est.) = Grant Solicitation and Awards



Photo of Seeley Farm: OAT



- ✓ **Natural Climate Solutions:** *Activity that enhances or protects net biological carbon sequestration on natural and working lands, while maintaining or increasing ecosystem resilience and human well-being.*
- ✓ **Climate Smart Agriculture:** *Farming, ranching or forestry practices that reduce greenhouse gas emissions or sequester carbon.*
- ✓ **Farm Viability:** *The ability of a farmer or a group of farmers to maintain an economically viable farm business*



Photo: Peter Rintels cc

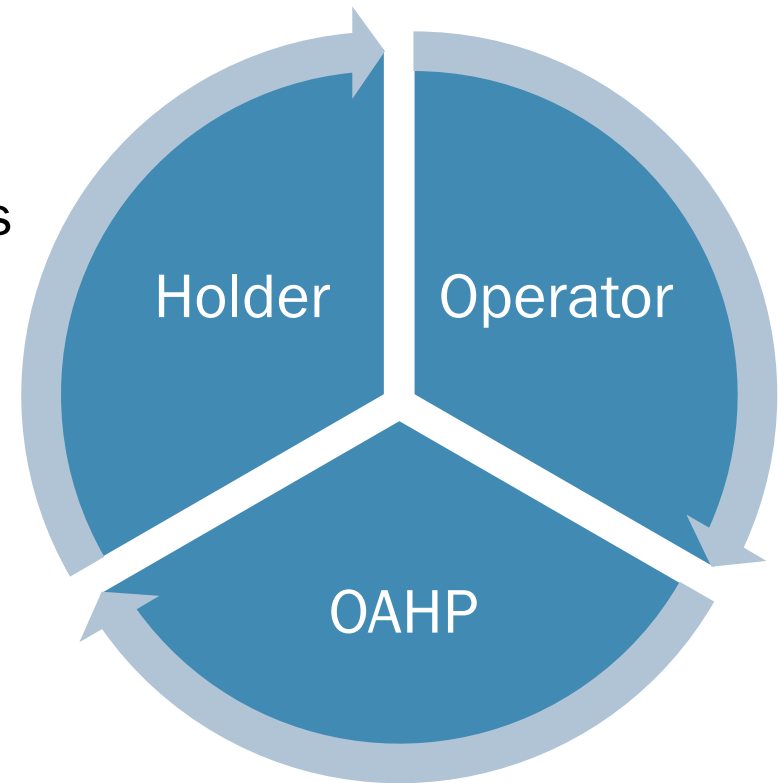
Table Ex-1. Recommended practices to reduce GHG emissions and sequester carbon in five of Oregon's natural and working lands sectors.

NWL Land Sector	Recommended Practices
Blue Carbon Ecosystems	★ Tidal wetland conservation
	★ Tidal wetland restoration
	Seagrass conservation
Rangelands	★ Prevent conversion to invasive annual plant dominated systems
	★ Restore deep rooted perennial grasses to areas impacted by invasive species
	★ Restore functioning riparian areas
	★ Prevent conversion of grasslands, shrublands, and savannas to juniper woodlands
	★ Prevent conversion to urban and/or row crop land use
Forestlands	★ Prevent conversion of forest to non-forest land uses
	Afforestation/Reforestation
	Improved forest management
	Increase the proportion of carbon stored within long-lived harvested wood products
	★ Reduce wildfire risks
Agricultural Lands	Anaerobic digestion of manure and beneficial use of methane or flaring and appropriate land application of digestate
	Improve irrigation strategies and efficiencies
	★ Improve nitrogen management
	Reduce enteric emissions from ruminant production systems via approved enzyme feed additives
	Reduce food loss and waste
	Support on-farm renewable energy and energy efficiency
	★ Protect agricultural lands from urban or industrialized conversion*
	★ Increase woody plant coverage*
	★ Encourage no-till and residue till management*
	★ Implement edge-of-field herbaceous (non-woody) conservation practices*
	Utilize cover crops and crop rotations*
	★ Improve nutrient management and reduce nitrogen application*
★ Prescribed grazing*	
★ Pasture-based management*	★ Increase riparian areas beyond the edge of field
Alternative manure management*	
Urban & Suburban Lands	Maintain and expand forest vegetation cover
	Improve fertilizer use in urban and suburban lands to reduce excess nitrogen releases

*Agricultural practices proposed by the Advisory Committee.



- ✓ **Develop and Implement** conservation measures
- ✓ **Payment for Ecosystem Service**
- ✓ **Leverage** Federal Farm Bill investments





✓ Define Strategies to:

- Enhance Habitat
 - Terrestrial
 - Aquatic
- Improve Water Quality
 - Nutrient Retention
 - Sediment Retention
- Sequester Carbon





✓ **Estimate Value** (of Ecosystem Services
Delivered through Plan Implementation)

- Habitat
- Water Quality
- Carbon Sequestration





✓ **Get Paid** (for Estimated Ecosystem Services
Delivered through Plan Implementation)

- Habitat
- Water Quality
- Carbon Sequestration



Table 2-2: NRCS Physical Effects Criteria Used for Each Environmental Benefit

Draft

Environmental Benefit Type	NRCS Physical Effect Qualifying Category 1	NRCS Physical Effect Qualifying Category 2
Carbon	Emissions of Greenhouse Gases – GHG's ¹	
Water Quality – Sediment	Sediment Transported to Surface Water	
Water Quality – Nutrients	Nutrients Transported to Surface Water	Nutrients Transported to Groundwater
Aquatic Habitat	Elevated Water Temperature	Aquatic Habitat for Fish and other Organisms
Terrestrial Habitat	Terrestrial Habitat for Wildlife and Invertebrates	
Soil Health ²	Organic Matter Depletion	Soil Organism Habitat Loss or Degradation

1/This rating category also includes sequestration of greenhouse gases, such as through tree or shrub establishment or soil sequestration.

2/Payments are proposed for practices that enhance soil health only as they pertain to water quality, carbon, and habitat, which are captured in the other benefit categories. However, as soil health enhancement is a key policy objective to enhance the productivity and resiliency of Oregon's agricultural lands, information regarding the effects of practices on soil health is included.

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Table A-1: Physical Effects Rating for NRCS Practices by Benefit Category

Conservation Practice	NRCS Practice Code	Carbon	Water Quality - Sediment	Water Quality - Nutrients	Aquatic Habitat (Max of Water Temperature OR Aquatic Habitat)	Terrestrial Habitat	Soil Health (Max of Organic Matter, Soil Organism Habitat, Compaction)
Carbon Eligible Practices							
Conservation Cover	327	4	4	4	1	3	5
Pasture and Hay Planting	512	4	1	1	0	4	4
Tree/Shrub Establishment	612	4	3	1	4	5	5
Windbreak/ Shelterbelt Establishment and Renovation	380	4	1	1	4	3	5
Nutrient Management	590	3	0	5	0	0	2
Residue and Tillage Management, No Till	329	3	4	2	0	1	4
Riparian Forest Buffer	391	3	5	5	5	5	5
Wildlife Habitat Planting	420	3	1	1	4	5	0
Soil Carbon Amendment	336	4	1	1	0	0	4
Forest Stand Improvement	666	3	0	1	1	2	1
Range Planting	550	3	2	1	1	2	4
Residue and Tillage Management, Reduced Till	345	3	3	2	0	1	3
Wetland Creation	658	3	2	3	0	2	2
Wetland Restoration	657	3	2	3	0	2	1
Water Quality or Habitat Eligible Practices							
Critical Area Planting	342	2	4	2	1	2	5
Grazing Land Mechanical Treatment	548	2	4	3	0	1	3
Riparian Herbaceous Cover	390	2	4	5	2	2	4
Upland Wildlife Habitat Management	645	2	2	0	0	5	0
Constructed Wetland	656	1	5	4	0	0	0
Filter Strip	393	1	5	5	2	1	1

Draft Conservation Practice	NRCS Practice Code	Carbon	Water Quality - Sediment	Water Quality - Nutrients	Aquatic Habitat (Max of Water Temperature OR Aquatic Habitat)	Terrestrial Habitat	Soil Health (Max of Organic Matter, Soil Organism Habitat, Compaction)
Water Quality or Habitat Eligible Practices (Continued)							
Forest Farming	379	1	4	1	4	3	3
Grassed Waterway	412	1	5	2	1	1	3
Restoration and Management of Rare or Declining Habitats	643	1	2	0	5	5	0
Vegetated Treatment Area	635	1	2	4	0	0	3
Vegetative Barrier	601	1	4	1	1	1	1
Wetland Wildlife Habitat Management	644	1	3	0	0	5	0
Early Successional Habitat Development/Mgt.	647	0	0	0	0	5	0
Saturated Buffer	604	0	0	5	0	0	0
Stormwater Runoff Control	570	0	4	2	0	0	1
Other NRCS Practices, Not Eligible for Payments (Insufficient Benefits)							
Alley Cropping	311	2	3	3	2	3	5
Cover Crop	340	2	2	2	0	1	2
Energy Efficient Agricultural Operation	374	2	0	0	0	0	0
Prescribed Grazing	528	2	2	1	1	2	4
Recreation Area Improvement	562	2	1	0	0	0	1
Silvopasture	381	2	3	3	3	2	3
Amendments for Treatment of Agricultural Waste	591	1	0	2	0	0	1
Brush Management	314	1	2	0	0	3	0
Conservation Crop Rotation	328	1	3	3	0	1	4
Contour Buffer Strips	332	1	3	2	1	1	1
Contour Orchard and Other Perennial Crops	331	1	3	2	1	0	2
Cross Wind Trap Strips	589C	1	1	1	0	0	1

**Table 3-2: Qualifying Practices, Crosswalk with USDA and Oregon Global
Draft Warming Commission**

Practices	NRCS "GHG Emissions" Improvement Rating	Included in USDA Climate Smart Practices?	Included in the Oregon NWL Recommended Practices	
			Agricultural Lands	Rangelands
Tree/Shrub Establishment	Moderate to Substantial	Yes	Yes	
Conservation Cover	Moderate to Substantial	Yes	Yes	
Pasture and Hay Planting	Moderate to Substantial	Yes	Yes	
Windbreak/Shelterbelt Establishment and Renovation	Moderate to Substantial	Yes	Yes	
Soil Carbon Amendment	Moderate to Substantial	Yes	Yes?	
Riparian Forest Buffer	Moderate	Yes	Yes	
Range Planting	Moderate	Yes		Yes
Forest Stand Improvement	Moderate	Yes	Yes (forest lands)	
Wetland Creation	Moderate			
Wetland Restoration	Moderate	Yes	Yes (tidal wetland)	
Residue and Tillage Management, No Till	Moderate	Yes	Yes	
Wildlife Habitat Planting	Moderate	Yes	Yes	
Nutrient Management	Moderate	Yes	Yes	
Residue and Tillage Management, Reduced Till	Moderate	Yes	Yes	

Table B-2: Summary of Data on Carbon Sequestration by Practice Type, Metric Tons C per Hectare per Year

Draft	Biardeau et al. (from COMET-Planner), 2016	Soil Carbon Chambers et al., 2016 (NRCS review)	Canqui et al., 2022 (Meta-Analysis)	Cai et al., 2022 (Meta-Analysis)	Fargione et al., 2018 (Natural Climate Solutions)	Gattinger et al., 2012 Meta Analysis	US EPA Greenhouse Gas Inventory, 2022	Oregon Forest Carbon Inventory	USDA Forest Carbon Data
Riparian forest buffers & tree/shrub establishment or afforestation	1.5 to 1.7							0.5 to 1.5 ^B	0.2 to 0.7 ^C
Other tree/shrub establishment, including hedgerow/alley cropping/multi-story cropping	1.2 to 1.4								
Herbaceous Cover (conservation cover, herbaceous wind barriers, vegetative barriers, contour buffer strips, field borders, etc.)	1.2	0.42 to 0.96			1.2 ^D		0.3 ^A		
No Till	0.3	0.15 to 0.27		~0					
Cover crops (Not Eligible)	0.3	0.15 to 0.22	.12						
Forage and biomass planting	0.3	.02 to 0.17							
Prescribed grazing (Not		0.17 to 0.44							
Range planting		0.22 to 0.35							
Organic soil amendments (replacing synthetic fertilizer)	1.8					0.27 to 0.45 ^E			

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Table 4-1: Payments by Practice Per Acre Per Year

Conservation Practice	NRCS Practice Code	Edge of Field Habitat Type	Edge of Field	Carbon	Water Quality - Sediment	Water Quality - Nutrients	Aquatic (Habitat (if Riparian Trees))	Terrestrial Habitat	Annual Payment per Acre		EQIP Oregon Payment per Acre
									If Riparian	If not Riparian	
Carbon Eligible Practices											
Conservation Cover	327	Grass/Shrub	Yes	\$5	\$90	\$135			\$225	\$225	\$117 to \$848
Pasture & Hay Planting	512	Grass/Shrub	No	\$5				\$100	\$100	\$100	\$102 to \$684
Tree/Shrub Establishment	612	Tree/Shrub	Yes	\$10			\$150	\$100	\$250	\$100	\$294 to \$5,380
Windbreak/Shelterbelt Establishment and Renovation ¹	380	Tree/Shrub	Yes	\$10			\$150		\$160 (\$2.05/tree)	\$10 (\$0.13/tree)	\$0.55 to \$7.58/ tree
Nutrient Management	590		No	\$5		\$9			\$14	\$14	\$8 to \$38
Residue & Tillage Management, No Till	329		No	\$5	\$6				\$11	\$11	\$16 to \$42
Riparian Forest Buffer	391	Tree/Shrub	Yes	\$10	\$90	\$135	\$150	\$100	\$485	\$335	\$1,882 to \$7,536
Wildlife Habitat Planting	420	Grass/Shrub	Yes	\$5			\$150	\$100	\$255	\$105	\$399 to \$4892
Soil Carbon Amendment	336		No	\$5					\$5	\$5	\$72 to \$2,000
Forest Stand Improvement	666	Tree/Shrub	Yes	\$10					\$10	\$10	\$113 to \$2,265
Range Planting	550		No	\$5					\$5	\$5	\$127 to \$379
Residue & Tillage Management, Reduced Till	345		No	\$5					\$5	\$5	\$20 to \$43
Wetland Creation	658	Wetland	Yes	\$5					\$5	\$5	\$3,428 to \$4,055
Wetland Restoration	657	Wetland	Yes	\$5					\$5	\$5	\$932 to \$4123

Draft Conservation Practice	NRCS Practice Code	Edge of Field Habitat Type	Edge of Field	Carbon	Water Quality - Sediment	Water Quality - Nutrients	Aquatic (Habitat (if Riparian Trees)	Terrestrial Habitat	Annual Payment per Acre		EQIP Oregon Payment per Acre
									If Riparian	If not Riparian	
Water Quality or Habitat Eligible Practices											
Critical Area Planting	342		Yes		\$90				\$90	\$90	\$332 to \$1,231
Grazing Land Mechanical Treatment	548		No		\$6				\$6	\$6	\$13 to \$97
Riparian Herbaceous Cover	390		Yes		\$90	\$135			\$225	\$225	\$817 to \$9,315
Upland Wildlife Hab Mgmt.	645		Yes					\$100	\$100	\$100	\$10 to \$309
Constructed Wetland	656		Yes		\$90	\$135			\$225	\$225	\$8,117 to \$13,924
Filter Strip	393		Yes		\$90	\$135			\$225	\$225	\$174 to \$244
Forest Farming	379		No		\$6		\$150		\$156	\$6	\$4 to \$6
Grassed Waterway	412		Yes		\$90				\$90	\$90	\$1,259 to \$2,497
Restoration and Management of Rare or Declining Habitats	643		Yes				\$150	\$100	\$250	\$100	\$16 to \$2,906
Vegetated Treatment Area	635		Yes			\$135			\$135	\$135	\$7,989 to \$17,793
Vegetative Barrier ²	601		Yes		\$90				\$90 (\$0.005/ft)	\$90 (\$0.005 /ft)	\$0.14 to \$1.13/ ft
Wetland Wildlife Habitat Mgmt.	644		Yes					\$100	\$100	\$100	\$10 to \$504
Early Successional Habitat Development/Mgmt.	647		Yes					\$100	\$100	\$100	\$29 to \$360
Saturated Buffer	604		Yes			\$135			\$135	\$135	N/A
Stormwater Runoff Control	570		Yes		\$90				\$90	\$90	N/A

Technical Assistance

- Working land projects or programs that lead to:
 - Conservation management plans or
 - Working land conservation easements



Program Updates



Photo: Oregon Clover Commission

-  Natural and Working Lands Funding Outreach
-  Short Session Funding
-  Upcoming Commission Meetings
-  Upcoming Solicitations
-  Upcoming Rule Making
-  Upcoming Open Seats on the Commission
 - Fish and Wildlife
 - Farmer/Rancher
 - Agricultural Water Quality
 - Natural Resources



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Thank You!

Conservation Management Plans

- (1) A summary describing how the conservation management plan meets OAHP's purpose;
- (2) The contact and location information for the agricultural landowner or operator and conservation management plan holder;
- (3) Relevant background and context of the working land and operation;
- (4) Inventory, including site characteristics and current management;
- (5) Short- and long-term social, economic, and conservation goals of the agricultural landowner or operator;
- (6) Resource analysis and identification of resource and management concerns;
- (7) Identification of potential plan activities and a justification for the activities that were selected for implementation;



Conservation Management Plans

- (8) The implementation plan, including a budget;
- (9) If applicable, a maintenance plan for infrastructure associated with the plan that may affect neighboring lands if not maintained over time;
- (10) The expected agricultural, fish or wildlife, water quality or other natural resource outcomes, and related social outcomes of the plan once implemented;
- (11) How the conservation management plan will be evaluated and managed;
- (12) A conflict resolution protocol for the agricultural landowner or operator and the conservation management plan holder if the grant program would fund the implementation of the plan; and
- (13) The term of the plan.

