Designing Working Lands Incentives for Oregon Agriculture

Possible policy structures for granting process, eligible strategies and practices, and program administration

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Introduction

At the request of the Governor's Carbon Policy Office, Oregon Department of Agriculture (ODA) and Oregon Watershed Enhancement Board (OWEB) developed a possible framework for an agricultural incentive program that could be adopted as part of the state's strategy to mitigate for and adapt to climate change. This incentive program would be in addition to a traditional offset program, details of which are yet to be determined. Due to several challenges and with some exceptions, participation in agricultural offset programs elsewhere within the United States and Canada has been limited. However, more flexible incentive programs (e.g., grant programs that fund practices providing quantifiable mitigation and adaptation benefits) have seen greater participation by agricultural landowners.

This document summarizes possible ideas for a granting process, eligible strategies and practices for incentives, options for administration of the program, and resources to assist with estimating mitigation and adaptation benefits. Finally, the document highlights opportunities for other types of natural and working lands incentives that should be explored by the State of Oregon in the near future.

Granting Process

1. For agriculture incentives, local project sponsors would apply for grants from the program administrator. Local project sponsors for agricultural incentives projects would typically be soil and water conservation districts (SWCDs). In certain areas of the state and where appropriate based on working relationships with agricultural landowners, watershed councils and other entities also may serve in this role.
2. Training would be recommended for potential project sponsors regarding activities that support climate change mitigation and adaptation, and on the scope of the use of the funds.
3. Local project sponsors would work with landowners to identify the practices to be implemented. (See 'Possible Eligible Strategies and Practices' section below.) In addition to support for on-the-ground practices, activities eligible for funding would include landowner engagement and technical assistance (TA) to plan and support delivery of practices and strategies.

4. Grants could be structured to either 1) allow costs for the range of eligible activities for a property to be encompassed within a single grant (i.e., landowner engagement, TA and practices funded by a single grant) or 2) be broken out by eligible activity type for a collection of landowners (e.g., a single TA grant to work with several landowners on technical design of practices).
5. Local project sponsors would work with landowners to complete a brief application, including information about the strategies and practices to be implemented, expected benefit of these, accurate spatial information about project location, pre-project photos and, as appropriate, additional baseline information and/or data about current condition. Following implementation of practices, post-project verification would be completed. In most cases, a project completion form and post-project photos will suffice. However, equipment purchase incentives and other practices may warrant an on-site visit. For management practices such as soil health, vegetation management and nutrient management, the local partner should receive an annual report form from the landowner, documenting the persistence and maintenance of the practice. Again, as necessary and appropriate, additional post-project information and/or data may be collected at defined intervals for certain practices (e.g., annual reports that document plant survival and possibly plant density and percent native/invasive plants for riparian planting projects).

Possible Eligible Strategies and Practices

A variety of strategies in agriculture offer climate mitigation or adaptation benefits, or both. "Mitigation" activities include those that reduce emissions of greenhouse gases such as carbon dioxide, methane, or nitrous oxide, or that sequester carbon in the soil. "Adaptation" activities include those that help agriculture adapt to projected challenges under climate change, including warmer, drier summers; conditions that favor certain pests and weeds; and more intense rainstorms. Tables 1-4 summarize agriculture related strategies and practices, the types and extent of benefits they provide, and how an incentive program could support these. Additional information about what the strategies entail follows each table. These strategies are grouped by the predominant benefit that they provide in terms of supporting climate change mitigation or adaptation, but many of these offer multiple co-benefits.

Some of the strategies involve one-time purchase or installation of equipment, with some annual routine maintenance afterwards. Others are management strategies that can be continually implemented and refined each year, based on adaptive management. For annually implemented strategies, three to five years' eligibility for incentives is a reasonable time frame that is consistent with other programs. The same time frame is reasonable for practices that involve a long-term and involved maintenance component, such as riparian buffers, although extended periods of time (e.g., 10-20 years) can deliver even greater mitigation and adaptation benefits. The carbon sequestration benefit of many practices, such as cover cropping, is greater the longer the practice is in use. To incentivize strategies

that provide as long-term a benefit as possible, the program could be structured to provide greater incentives the longer the time commitment to maintain the practice.

Many of these strategies also are eligible for other incentive programs because of the multiple benefits they provide, such as water quality protection. Multiple incentives for the same strategy can make them economically feasible, and bundling multiple incentive programs to support projects is a customary strategy for local partners, as long as funding from the cumulative incentive programs does not add up to more than the total cost of the activity. A preliminary crosswalk of OWEB treatments and NRCS practices is available to inform how actions supported with co-mingled funds can be tracked and reported on.

Due to Oregon's diversity of crops, landscapes and climates, as well as rapidly evolving technologies and new research, there is significant variation in the way growers apply these practices across the landscape. Incentive program design should be flexible enough to incentivize mitigation and adaptation outcomes even as specific implementation technologies and activities change over time.

Incentive program design should not be exclusionary towards producers who have already achieved a high level of natural resource protection while continuing to motivate additional strategies. One existing federal program which provides an example of including early adopters is the Conservation Stewardship Program - producers who have already adopted a variety of natural resource protection strategies and agree to
adopt additional enhancements to their operating systems are given priority for acceptance into the program.

Program Area 1. Soil Health and Vegetation Management

A number of strategies exist in agriculture that build soil health, protect the soil from erosion, allow the soil to absorb more water, and reduce water loss from the soil. Incentives for each of the following strategies could be provided on a per-acre basis, similar to the way they are provided by U.S. Department of Agriculture (USDA) programs.

Pasture and range management practices include subdividing pastures into paddocks; monitoring livestock grazing impacts on plant height; moving livestock through rangeland, pastures and paddocks when the plants are grazed to the appropriate minimum height; and adjusting stocking rates and duration of grazing based on the health of the pasture or rangeland. These activities can be time-intensive and involve frequent monitoring and checking of pasture or rangeland plant condition. Costs for this work can be highly variable depending on the strategies used to subdivide grazing areas and provide watering sources. In addition, the farmer or rancher's time investment is significant due to the monitoring needed.

Pasture and range management support carbon sequestration by maintaining soils in healthy, permanent cover and leaving some plant material that becomes part of the soil. In addition, they support adaptation by maintaining a less hospitable environment for invasive weeds (which are often able to exploit changing climate conditions) and by helping to maintain the soil's water holding capacity. Healthy pasture and range plants are also better able to use the nutrients applied in fertilizer or manure and avoid loss of those nutrients.

Cover cropping involves planting an annual or perennial cover to protect the soil from erosion and scavenge leftover nutrients from the soil. For example, growers of perennial crops such as blueberries and wine grapes plant perennial grass cover in between rows. Permanent cover crops can contribute to carbon sequestration in the soil. Both annual and perennial cover crops also offer adaptation benefits by protecting the soil during intense rainstorms. The cost of cover cropping can vary depending on the local site conditions such as slope and climate, but it is generally a low-cost practice to establish and involves maintenance to control weeds and maintain vegetative cover.

Mulching can be used in combination with cover cropping or on its own. It involves spreading a layer of straw or other vegetative material onto the soil to protect it from erosion, reduce evapotranspiration, and build soil quality. It can offer adaptation benefits by protecting the soil during intense rainstorms and reducing moisture loss from the soil. Mulching can be very labor-intensive to install and the cost depends on the availability of straw, shells or other mulch material, but it is generally low to medium cost.

Filter strips involve establishing one or more strips of grass (typically perennial grass) to filter sediment from runoff before the runoff leaves a field or enters a waterway. They are typically planted perpendicular to the slope of the field so that water runs through the filter strip and spreads as much as possible. They provide sequestration benefits in the area of soil that is covered by the filter strip, and also provide adaptation benefits by helping to avoid soil loss from fields under intense precipitation. They are most effective if they are used in combination with other practices that prevent erosion at the source, or if they are installed in multiple locations across the slope of a field. The cost to install a filter strip varies depending on the site conditions such as slope and climate, but it generally low cost to install with some annual follow-up maintenance involved.

Riparian buffers are strips of vegetation established along streams. Depending on the site, vegetation could be planted and actively managed to allow it to grow, or vegetation management at the site can be changed to allow for natural regeneration of streamside vegetation. Riparian buffer vegetation provides carbon sequestration benefits and can also support adaptation by providing filtration of nutrients and sediment from overland flows, promoting bank stability, and depending on the site, providing shade.

The costs of riparian buffer installation vary depending on whether vegetation must be planted or can be established through natural regeneration, and also depend on the amount of weed control involved.

Eligible Activity	**How incentive rate could be set up**	**Documentation/ verification needed**	**Type and extent of benefits**
Pasture and range management	rate per acre per year used	Application Report form for each year implemented	Sequestration/low Adaptation/medium
Cover crops	rate per acre during establishment year	Application Report form and photos	Sequestration/medium Adaptation/medium
Filter strips	rate per acre	Application Report form and photos	Sequestration/low Adaptation/low
Mulching	rate per acre during establishment year	Application Report form and photos	Sequestration/low Adaptation/medium
Riparian buffers	two rates per acre - one for natural regeneration and one for active restoration (payment during establishment year and maintenance payment for following years)	Application Report form and photo annually, with the total number of years to be determined by the grant period	Sequestration/low to medium Adaptation/high
Avoided conversion of grasslands/rangelands to more intensive use	rate per acre for each year that conversion is avoided	Application illustrating conversion pressure	Mitigation/medium

<u>Program Area 2. Nutrient Management</u>

Nutrient management practices can help minimize emissions of nitrous oxide, a greenhouse gas that is more powerful on a per-molecule basis than carbon dioxide.

Commercial fertilizer, manure, compost, and process wastewater are some examples of materials that are applied in agriculture to provide nitrogen to crops. Understanding the amount of nitrogen that is being applied and matching nitrogen application rates to the

economically optimal rate are key strategies that minimize nitrous oxide emissions. Depending on the type of material applied, strategies to minimize emissions can include testing the product applied for nitrogen content, monitoring soil nitrogen content and/or crop leaf tissue nitrogen content through testing during the growing season, applying nitrogen at the economically optimal application rate (rather than the rate that will maximize yield), and conducting post-harvest soil testing to determine the levels of nitrogen left over in the soil to evaluate whether application rates the following year should be adjusted.

Possible incentive rate structures for nutrient management practices could include a flat per-acre rate paid annually for the cropland the grower enrolls, reflecting the testing costs and the grower's and project sponsor's time to conduct the adaptive management involved with these practices.

Oregon issues permits and requires Animal Waste Management Plans for all facilities that meet the state definition of a Confined Animal Feeding Operation. For all large and individually permitted operations, soil and manure testing is already required; medium and small general permitted operations are allowed to use accepted values from reference materials. Activities above and beyond what is required in an operation's CAFO permit, such as crop tissue testing or, in the case of small and medium operations, soil and manure testing, could be included as eligible practices under an incentive program.

Eligible Practice	**How incentive rate could be set up**	**Documentation/verification needed**	**Type and extent of benefits**
Soil/tissue/manure testing	rate per acre or rebate per test, during each year used	Application describing proposed activities Report form for each year implemented	Mitigation/medium

Program Area 3. Water Management Practices

Irrigation water management practices are predominantly adaptation strategies that maximize the value of water applied to crops. They can involve using more efficient irrigation equipment, performing regular maintenance activities, and combining experience with data and tools to make decisions about when and how much to irrigate. Depending on whether the irrigation system consumes power to apply water and the source of the power used, some irrigation water management practices may also reduce emissions associated with electricity use.

Irrigation scheduling involves evaluating soil moisture measurements, weather, climate, and crop data to determine when and how much to irrigate. Soil moisture monitoring using moisture meters or measuring devices is a strategy that is typically used in combination with other sources of data. Costs associated with irrigation scheduling can include costs to subscribe to a local weather and irrigation data service, the costs of purchasing meters and supporting software, and the time involved for growers and project sponsors to evaluate and interpret data.

Equipment upgrades combined with irrigation scheduling can maximize the value of applied irrigation water, supporting adaptation under scarce water conditions. For example, where appropriate, conversion from "big gun" sprinklers to linear or pivot sprinklers, or conversion from sprinklers to drip systems, can maximize water use efficiency as well as reduce energy use. The capital costs for irrigation system conversion often cost several thousand, if not hundreds of thousands of dollars, depending on the acreage being converted.

Open irrigation ditches can also be converted to piped water delivery systems, dramatically reducing water loss to evaporation. Irrigation districts in central and eastern Oregon have completed a number of piping projects in the past decade and continue to implement projects. These projects are relatively expensive, but opportunities remain both within irrigation district service territories and in private ditches delivering water to farms.

Possible incentive rate structures for irrigation scheduling could include a per-acre incentive rate, or a rebate for monitoring equipment up to a cap. For conversion to more efficient irrigation equipment, incentives could cover a percentage of capital costs up to an identified cap.

Eligible Practice	**How incentive rate could be set up**	**Documentation/verification needed**	**Type and extent of benefits**
Soil moisture monitoring	Rebate for equipment and computer program	Invoices	Mitigation/low to medium Adaptation/high
Conversion to more efficient irrigation equipment	Percentage of capital costs up to an identified cap	Invoices	Mitigation/low to medium Adaptation/high
Other water use efficiency projects such as piping open ditches	Percentage of capital costs up to an identified cap	Invoices	Adaptation/high

<u>Program Area 4. Investments in Carbon-Intensive Fuel Reductions</u>

Propane and diesel are two types of carbon intensive fuels that are necessary for a variety of farming activities. Diesel tractors pull implements that prepare soils for planting; harvesting equipment is also diesel-powered. Propane provides heating for greenhouse and nursery crops and is used to dry a variety of commodities such as hazelnuts. A variety of strategies can reduce use of these fuels and associated greenhouse gas emissions.

Opportunities to reduce diesel use are particularly associated with tillage equipment. Under a conventional tillage system, a grower may make multiple trips across the field with a tractor pulling tillage attachments such as plows or disks, harrows and rollers to break up the soil and prepare the seedbed for planting. Strategies such as no-till or reduced-till mean fewer trips across the field; each reduction in a trip results in fuel savings.

While reducing diesel use saves fuel costs, it can also involve significant risks, as well as a significant investment of time and in some cases, equipment. Challenges faced by growers converting to no-till and reduced-till systems can include slower soil warming in the spring and slower crop growth; management challenges with different species of weeds; and increased presence of pests like slugs due to more hiding places. Incentives can help offset some of the additional time and financial resources involved with the conversion process. Possible incentive strategies could include a per-acre incentive rate, a cost-share of equipment costs when applicable, or an incentive based on projected fuel savings.

Strategies to reduce propane use vary greatly by operation, but examples include upgrading greenhouse wall materials, switching heating fuel or heating systems in greenhouses, energy curtains, and switching fuels used for commodity drying. Many of these upgrades involve significant capital expenditures.

Incentives for diesel and propane reduction activities could be structured based on the projected savings, up to an identified cap in total incentive; or could be based on a percentage of the cost of efficiency investments, up to an identified cap.

Eligible Practice	**How incentive rate could be set up**	**Documentation/verification needed**	**Type and extent of benefits**
Propane use reduction	50% of capital costs up to an identified cap or by savings	Projected energy savings from vendor; inspection after installation; invoices	Mitigation/medium
Diesel use reduction	50% of capital costs up to an identified cap or by savings	Projected energy savings based on pre- and post-project tillage sequence; projected energy savings from vendor	Mitigation/medium Adaptation/medium

Existing Incentives Programs and How These Support the Aforementioned Strategies and Practices

Program	Strategies and Practices Supported (not exhaustive)	Notes
USDA Environmental Quality Incentives Program	• Conservation tillage • Cover cropping • Conservation cover • Irrigation efficiency • Grazing management • Nutrient use efficiency • Tree and shrub establishment	• As authorized by USDA Farm Bill • Addresses natural resource concerns on working lands • Competitive contract application process • Provides up to 50%-75% cost-share • Program is extremely popular and there are more projects than funding available • Provides opportunities for beginning farmer/ranchers and historically underserved farmer/ranchers
USDA Conservation Stewardship Program	• Conservation tillage • Cover cropping • Irrigation efficiency • Grazing management • Nutrient use efficiency • Tree and shrub establishment	• As authorized by the USDA Farm Bill • This program provides incentives for enhancements to producers who have already implemented extensive stewardship activities. • Program is extremely popular and there are more projects than funding available • Provides opportunities for beginning farmer/ranchers and historically underserved farmer/ranchers • Under current Farm Bill can extend contracts and re-enroll for a maximum of 10 years
USDA Conservation Reserve Program -- This program is administered through the USDA's Farm Service Agency with NRCS providing the technical protocols for the implementation of the program	• Conservation cover in both grassland and forestland settings	• As authorized by USDA Farm Bill • In Oregon, this is generally for sensitive uplands vulnerable to soil erosion (most contracts in northeast and north-central Oregon) • Currently 10-year contracts with some re-enroll options • Facing challenges with national acreage caps that may reduce the program footprint in Oregon

Program	Strategies and Practices Supported (not exhaustive)	Notes
USDA Conservation Reserve Enhancement Program -- This program is administered through the USDA's Farm Service Agency with NRCS providing the technical protocols for the implementation of the program, and OWEB providing state match funds.	• Streamside buffers • Streamside wetland restoration • Conservation cover	• As authorized by USDA Farm Bill • Provides rent and cost-share to remove riparian lands from ag production & establish buffers • 10- to 15-year contracts • Not fully subscribed
USDA Conservation Stewardship Program	• Conservation tillage • Cover cropping • Irrigation efficiency • Grazing management • Nutrient use efficiency • Tree and shrub establishment	• Signup for this program of the 2008 Farm Bill is open in every county nationwide on a continuous basis • Participants enter into a 5-year contract to receive an annual payment based on land use • Those enrolled will develop and follow a plan to addresses at least one priority resource concern not previously treated • Payments are limited to $40,000 per year and $200,000 per contract • Subscription level varies by year; typically some applications have to be deferred but are sometimes able to get contracts for all qualified applications
Oregon Watershed Enhancement Board (OWEB) grants	• Streamside restoration • Wetland/estuary restoration • Upland habitat restoration (e.g., sagebrush conservation, forest-health restoration) • Land acquisitions / conservation easements to protect sensitive habitats • Water acquisitions to conserve/protect water instream	• Focused on restoration and conservation of native fish and wildlife habitat and actions to address water quality issues • A portfolio of different grant offerings, ranging from small-dollar Small Grants to multi-year, large-dollar Focused Investment Partnerships • Some grant offerings targeted at specific habitats (e.g., Coastal Wetlands grants, Forest Collaboratives grants) • Competitive grant processes • 25% match requirement • Biennial budget fully allocated

Program	Strategies and Practices Supported (not exhaustive)	Notes
USDA Rural Energy for America Program	• Energy efficiency measures in ag • Renewable energy measures in ag	• Must be outside a metropolitan statistical area • Application process is extensive, but agency staff work hard to help • Budget fully allocated; program receives more applications than it is able to fund
Irrigation efficiency rebates from Energy Trust (funded by PGE and Pacific Power ratepayers)	• Variable frequency drives • Switching to more efficient application equipment • Maintenance activities that save water such as switching nozzles • Soil moisture monitoring	• Frequently used but not fully subscribed
BPA Utility Rebate Incentives	• Scientific irrigation scheduling (SIS) soil moisture monitoring • Variable frequency drive installation • Irrigation pump testing and system analysis • Irrigation hardware upgrades (replacing sprinklers, retrofitting center pivots, installing drop tubes, converting to low pressure irrigation systems, also available for wheel-line hubs and levelers) • Installation of Low Energy Precision Agriculture (LEPA) and Low Elevation Sprinkler Application (LESA) irrigation technology • Lighting upgrades • PNW Wineries energy efficiency assistance	• SIS also known as Irrigation Water Management rebates will not be supported by BPA after Dec. 2018 • Rebates available for water conservation projects; results in reduced energy costs and fertilizer use • VFD rebate available on pumps 20 hp or greater and storage fans • Fully subscribed every year relatively quickly after funding becomes available

Program	Strategies and Practices Supported (not exhaustive)	Notes
Oregon Water Resources Department (OWRD) – Water Project Grants and Loans	• Water conservation, reuse, above-ground storage and below-ground storage • Streamflow protection or restoration • Water distribution, conveyance or delivery systems	• This program provides loans and grants for water development projects that have economic, environmental and social/cultural benefits. • Grants will require a 25 percent cost-share match, which may include in-kind contributions. • Fully/oversubscribed

Possible Grant Program Administrators

Based on a review of the existing incentives program, possible grant program administrators include:

- Oregon Watershed Enhancement Board – OWEB administers approximately 14 grant programs currently, including programs that support some of the practices listed above. Grant programs such as the Conservation Reserve Enhancement Program and the in-development Oregon Agricultural Heritage Program are housed within OWEB. The existing grant-making infrastructure could be utilized to administer funds associated with cap-and-invest revenue for natural and working lands, including agricultural lands. OWEB regularly partners with federal agencies, including NRCS, to co-invest in important programs that engage agricultural and other landowners in addressing pressing natural resources issues.

  Changes to OWEB's statutes likely are not needed related to grant administration for directing revenues from the cap-and-invest program to fund climate adaptation and sequestration work. However, statutes for the cap-and-invest program will need to define 1) the eligible practices, 2) proportion of funding allocated for these practices, 3) consultation requirement with ODA related to investments in agricultural strategies and practices, and 4) OWEB as the revenue recipient and grant administrator, should the Legislature decide on this direction.

  OWEB is a logical administrator for Program Areas 1-3 listed above, and may also be able to administrator incentive grants for Program Area 4.
- For a subset of Program Area 3, another possible administrator is OWRD, which currently provides a limited number of grants and loans in support of projects that convert to more efficient irrigation equipment. As an alternative, OWRD could provide technical support while OWEB administers the grants.
- For Program Area 4, other possible administrators may include: Resource Conservation & Development Councils, Oregon Department of Environmental Quality, or Oregon Department of Energy. Those entities could also serve as technical support, while OWEB provides the fiscal administration.

State investments in agricultural lands incentives can leverage federal investments through a host of programs outlined in the Conservation Programs chart.

Possible Measurement Tools

Incentives programs offer more flexibility than offsets programs. Nonetheless, incentives programs should include a component to quantify the benefits of the strategies and practices being implemented. The state should look for opportunities to utilize existing measurement tools that would quantify benefits while lesser administrative burden by avoiding the creation of new measurement tools and/or requirements. For example, NRCS utilizes a number of existing tools to qualitatively and quantitatively assess the benefits of soil health-related activities. These tools would be relevant as the State considers methods to tracking and reporting the benefits of such practices as pasture and range management, cover crops, and mulching. Similarly, existing tools (such as the 'Nutrient Management and Planning Tool') and in-development performance tracking methods for programs such as the Conservation Reserve Enhancement Program could assist with tracking benefits of nutrient management and riparian buffers, respectively. In addition, experts from the ODA, Oregon State University Extension, Oregon Department of Forestry, and OWRD, along with other agency and non-profit partners, should be engaged to advise on appropriate measurement tools to quantify benefits from the range of eligible practices listed above.

Opportunities for Other Types of Natural and Working Lands Incentives

This document focuses on mitigation and adaptation strategies and practices that have direct relevance to agricultural producers. The Natural and Working Lands work group also discussed a briefing memorandum regarding forest offsets (and, to a lesser degree, forest incentive/investment programs).

An ongoing opportunity exists for the State of Oregon to develop a companion document that focuses on other types of strategies and incentive programs for natural lands as well as working lands. Such a document could encompass a range of additional strategies that have mitigation, adaptation and/or resilience benefits, including:

- Wetland enhancement and protection,
- Tidal and estuarine enhancement and protection (resulting in 'blue carbon' benefits),
- Floodplain reconnection,
- Conservation tillage, and
- Rangeland conservation and restoration, among others.