Payment for Ecosystem Services and Soil Health Working Group Approach Overview

The following is a suggested approach to advance three streams of work under the WG's charge simultaneously. Below the proposed approach is a table that provides a "crosswalk" between the recommendations of the WG's interim report in January 2020 and the legislature's charge to the WG, as well as other background from the report to provide context for the task approach.

Proposed Tasks and Approach for Advancing the PES and Soil Health Working Group

The work would move forward as follows:

- Full WG meetings would serve as opportunity to do task-oriented work in small groups and to discuss key work produced by task groups between and during meetings

- Flow of meetings would be every 2 weeks, 1.5 hours each, with 15 minutes in full group, 1 hour in task work in breakout groups, and 15 minutes to report back. Public attendees are free to observe any breakout they wish.

- Tasks would include:

    - **Soil Health Task**: 1) refine soil health definition based on existing definitions to the greatest extent possible to avoid conflict with existing programs and funding sources; 2) advancing research questions on soil health and its connection to ecosystem services; 3) consider means to measure, monitoring and model soil health as part of a ES program.

    - **Costs, Benefits, and Allocation (Economics) Task**: 1) explore options for a recommended price for a unit of soil health or other unit of ecosystem service or benefit provided; 2) an estimate of the potential quantifiable future benefits of the recommended payment for ecosystem services approach, including for nutrient reduction, flood mitigation and prevention, and carbon sequestered; 3) proposed eligibility criteria for persons participating in the program.

    - **Program Task Leads to**: 1) describe, and provide an initial evaluation of new and emerging technologies and programs for measuring and monitoring non-soil health (covered above) outcomes and ecosystem services proposed; 2) program design, based on the CIG research, RCCP grant program approach for P, and the PES principles outlined in the 2020 WG Report, for a recommended payment for ecosystem services approach the State should pursue that benefits water quality, flood resilience, and climate stability; 3) methods for incorporating the recommended payment for ecosystem services approach into existing research and funding programs.

Proposed Task/Workstream Assignments

Name	Affiliation	Workstream
Stacy Cibula	VHCB	Economics
David Conner	UVM	Economics
Vicky Drew	NRCS	Economics
Scott Magnan	FWA (Farmer Watershed)	Economics
Matt Vaughn	LCBP	Economics
Alissa White	Gund Institute for the Environment UVM	Economics
Juan Alvez	UVM Extension	Program
Jill Arace	VACD	Program
Paul Doton	CTRFWA	Program
Heather Furman	TNC Vermont	Program
Ed Pitcavage	Philo Ridge Farm	Program
Marli Rupe	DEC	Program
Meredith Albers	NRCS-VT	Soil Health
Cat Buxton	Vermont Healthy Soils Coalition	Soil Health
Alyson Eastman	AAFM	Soil Health
Joshua Faulkner	UVM Extension	Soil Health
Brian Kemp	CVFC	Soil Health
Maddie Kempner	NOFA_VT	Soil Health

MAPPING WG RECOMMENDATIONS ONTO 2020 LEGISLATION CHARGES

WG JANUARY 2020 RECOMMENDATIONS	2020 LEGISLATIVE CHARGE
Recommendation #1: Charge and resource this Working Group over the next two years to explore and advance transformative investment in agriculture's role to rebuild the natural capital of Vermont.	*Complete*
Recommendation #2: Advance our understanding of soil health and the services it provides.	#2: a recommended definition of healthy soils, a recommended method or systems for measuring soil health and other indicators of ecosystem health, and a recommended tool for modeling and monitoring soil health;
Recommendation #3: Review, evaluate, and integrate existing tools for PES monitoring and modeling along with identifying new tools and their potential for use in Vermont.	#1: a recommended payment for ecosystem services approach the State should pursue that benefits water quality, flood resilience, and climate stability, including ecosystem services to prioritize and capital or funding sources available for payments;
Recommendation #4: Support the tailoring or advancement of new emerging tools or programs.	#1: a recommended payment for ecosystem services approach the State should pursue that benefits water quality, flood resilience, and climate stability, including ecosystem services to prioritize and capital or funding sources available for payments;
Recommendation #5: Advance the design and development of PES approach(es) that regrow or sustain our natural capital so that it provides at least three ecosystem services: water quality, flood resilience, and climate stability.	#1: a recommended payment for ecosystem services approach the State should pursue that benefits water quality, flood resilience, and climate stability, including ecosystem services to prioritize and capital or funding sources available for payments; #3: a recommended price, supported by evidence or other justification, for a unit of soil health or other unit of ecosystem service or benefit provided; #4: proposed eligibility criteria for persons participating in the program #6: an estimate of the potential future benefits of the recommended payment for ecosystem services approach, including the projected duration of the program;

	#7: an estimate of the cost to the State to administer the recommended payment for ecosystem services approach; and #8: proposed funding or sources of funds to implement and operate the recommended payment for ecosystem services approach.
Recommendation #6: Refine and evolve the Vermont Environmental Stewardship Program (VESP) to allow continued joint learning and engagement with farmers around PES. Additionally, continue to connect farmers to existing PES-type programs.	#5: proposed methods for incorporating the recommended payment for ecosystem services approach into existing research and funding programs
Recommendation #7: Maximize access and use of existing programs to ensure farmers have capital to continue to implement practices or actions that lead to increase ecosystem services.	#5: proposed methods for incorporating the recommended payment for ecosystem services approach into existing research and funding programs
Recommendation #8: Seek additional grant opportunities, where feasible, to advance the vision of the Working Group during its chartered lifetime.	#8: proposed funding or sources of funds to implement and operate the recommended payment for ecosystem services approach.

BACKGROUND FOR PES WORK GROUP 2021 WORK PLANNING

Derived from existing documents

Version 3-25-21

VISION FROM 2020 REPORT

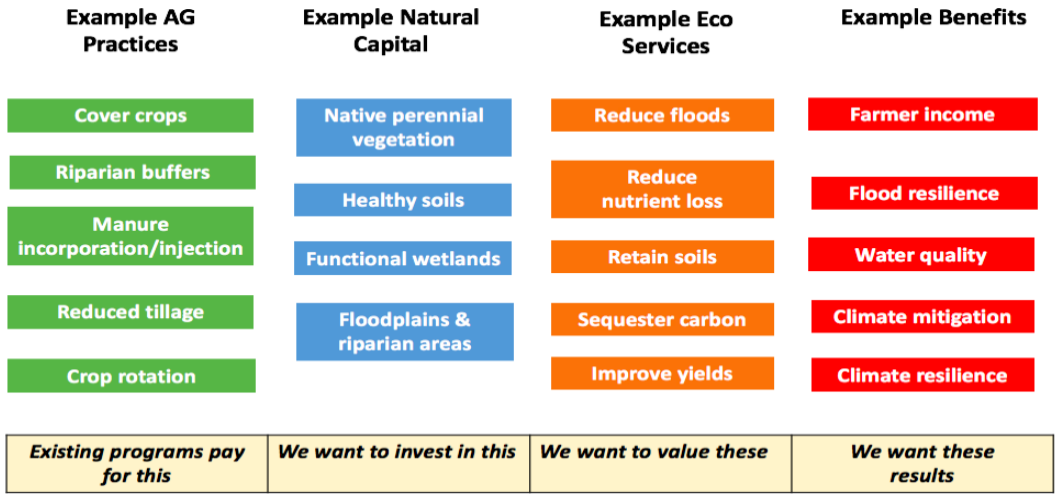
The Working Group envisions a system in which farmers are hired to use their ingenuity and know-how in caring for the land to rebuild Vermont's natural capital.

The group aims to catalyze a paradigm shift in how farmers are acknowledged for and empowered to perform their essential roles of environmental stewardship as well as providing food and fiber. We envision a future where farmers are recognized as land stewards, where they are compensated from numerous and diverse income streams for their provision of a range of ecosystem services, and the public invests in the rebuilding and restoration of our state's natural capital.

This paradigm shift involves transforming or expanding from:

- Farming land to stewarding it;
- Compensation for crops and commodities only to compensation for additional ecosystem services too;
- A focus on fields to one on landscapes;
- Compensation for practices (e.g., cover crops) to payment for performance (e.g., tons of soil retained) and investment in natural capital
- Modeling to monitoring; and,
- Assistance programs to realigned and internalized incentives, including through markets.

DESCRIPTION OF TERMS



PES PRINCIPLES FROM 2020 REPORT

In exploring various PES approaches, the group also identified a number of guiding questions and criteria to be addressed. Some of these are assertions and some are questions that may require further investigation and research. These include:

- Paying farmers for producing services that go above and beyond Required Agricultural Practices (RAPs). Eligible participants should meet Required Agricultural Practices (RAPs).
- Investing in agriculture to evolve and transform behavior is a cost-effective place for society to invest in a range of environmental benefits.
- Identifying a baseline from which to measure performance, that includes recognizing good work already done by some farmers and including those who may not have had the opportunity to join past programs to participate, is important.
- Ensuring all farms, regardless of size, geography or product have the opportunity to participate, while recognizing that small farms may not have the staff, technical resources, or financial capital to be as robust in their response.
- Utilizing Vermont- and farm-specific data to the greatest extent possible while ensuring data gathering does not overwhelm in both cost and time the payments to farmers for action.
- Determining if the intent is for a series of payments over time that diminish as performance advances, upfront capital assistance to achieve long-term sizable gains, or on-going annual payments in perpetuity to obtain the desired services, or some combination thereof.
- Setting prices and payments needed to both effect measurable and desirable change at the watershed or state-wide scale and provide meaningful additional income streams to or investments in farms.
- Seeking out new markets and additional dollars while drawing on and utilizing as effectively as possible current state and federal agricultural conservation programs as well as other public investments.
- Ensuring the administrator of the program is highly knowledgeable, trusted, flexible, innovative, and can deliver outcomes at reasonable costs.

PRIORITY RESEARCH QUESTIONS FROM 2020 REPORT

Through this preliminary work, the Working Group has identified a series of research questions that need to be addressed further before the group seeks to make final recommendations regarding the design and implementation of a PES approach. Among these are:

1. What ecosystem services or types of natural capital will be paid for? Does soil health or the building of natural capital provide these services in measurable ways?

2. How will these services and natural capital be measured? How will the efficiencies of modeling (based on robust models with locally relevant and accurate data sets) be balanced with the precision of farm-specific monitoring to measure actual performance? What existing, modified, or emerging new technologies can be utilized to truly measure performance and outcomes?

3. What are the cost-savings that can be expected and realized by improving ecosystem services? What are the existing externalized costs that Vermonters are already funding and how can these funds be redirected from effects to causes?

4. What private and/or public funding sources will be tapped to make these payments?

5. Who will be eligible to be compensated for providing these services? What payment scheme will best balance fairness (i.e. compensating for gains already made for farmers ahead of the curve as well as to those making improvements now) with efficiency (i.e. compensating for the largest improvements and greatest gains)?

6. How can this PES approach developed by this effort initiate a pathway towards broader market-based systems for compensating farmers for providing ecosystem services beyond state and federal programs only? What early steps does this approach need to take to work toward that goal? Who can best administer this or these PES approache

JANUARY 2020 RECOMMENDATIONS

Recommendation #1: Charge and resource this Working Group over the next two years to explore and advance transformative investment in agriculture's role to rebuild the natural capital of Vermont.

Done

Recommendation #2: Advance our understanding of soil health and the services it provides.

Specific Actions

1. The WG review, discuss, and agree to a specific definition of healthy soils.

2. The WG connect with other public and private innovative efforts around the country regarding defining, measuring, and rebuilding soil health in order to better understand the state of evidence linking soil health and the many ecosystem services we desire.

3. The WG support a technical synthesis of what is known and not known about soil health and various ecosystem services from nutrient retention to flood prevention, including the appropriate and best tools for modeling and monitoring soil health

4. For existing AAFM, NRCS, DEC, and UVM Extension research efforts like CEAP, incorporate into existing edge-of-field and other on-going studies as possible:

    a. measurements of soil health, most likely using the Comprehensive Assessment of Soil Health (CASH) tool, or key components of that tool supplemented with other metrics;
    b. gathering and analysis of data from edge-of-field research to identify more clearly the correlations among elements of soil health as measured by CASH and ecosystem services such as water quality, nutrient retention, flood storage, carbon sequestration;
    c. conservation approaches that involve regenerative agriculture concepts and decision-making strategies.

Recommendation #3: Review, evaluate, and integrate existing tools for PES monitoring and modeling along with identifying new tools and their potential for use in Vermont.

1. The WG scope the specific ecosystem services and/or natural capital they want tools to be able to evaluate or quantify.

2. The WG recommend supporting two key reviews of existing and emerging tools and techniques.

    a. Review the strengths and weaknesses of monitoring and modeling tools used by various state and federal agencies regarding ecosystem services, the degree to which they utilized Vermont or field-specific data, their cost, how they might be integrated into a program or approach, and where further tool development or testing is needed. The Vermont Agricultural Water Quality Partnership (VAWQP) – an interagency, state-wide partnership, as well as others could have a key role in this effort.

    b. Through an independent contractor or entity identify, describe, and provide an initial evaluation of new and emerging technologies and programs for measuring and monitoring outcomes and ecosystem services, particularly those seeking to gather real-time data, utilization of newer technologies be that satellite data, drone data, LIDAR, or other means, and that might put real time data quickly and clearly into the hands of farmers. This review should analyze where on the technological development spectrum each technology rests, how much investment would be needed to advance to a workable scale, and which tools might best meet the needs of Vermont. This should also include identifying existing private or private-public PES

programs occurring at the regional or national scale and identify their tools and potential applicability to Vermont.

Recommendation #4: Support the tailoring or advancement of new emerging tools or programs.

Specific Actions

1. Based on the reviews completed in earlier recommendations, further refine and hone an approach to PES in Vermont that can achieve as many of the principles as possible outlined in the beginning of this Report.

2. Based on the reviews completed in earlier recommendations, through an RFP or RFQ, the WG would solicit responses from capable and innovative entities (private or public) to advance key tools to allow PES program in Vermont to operate.

Recommendation #5: Advance the design and development of PES approach(es) that regrow or sustain our natural capital so that it provides at least three ecosystem services: water quality, flood resilience, and climate stability.

Specific Actions

1. Because an existing Conservation Innovation Grant let by USDA is already in place to undertake this work, we recommend the WG engage with the resources of the CIG along with the lead agencies on water quality (VAAFM and DEC), with the technical assistance of NRCS and UVM Extension, to advance this work together. *The WG is not asking for a specific line item budget for this task since is covered under existing NRCS funds.* This effort will:

    a. Focus on improving water quality at the watershed or state-wide scale through a performance-based PES approach rather than payments for practices.
    b. Explore flood resilience at the local scale as an ecosystem service of flood resilience
    c. Explore how to pay for sequestering carbon for climate change mitigation through emerging national or international markets.
    d. Determine if each of these should be approached separately, through a market or payment, or bundled together into a package of services to arrive at one payment for multiple results

Recommendation #6: Refine and evolve the Vermont Environmental Stewardship Program (VESP) to allow continued joint learning and engagement with farmers around PES. Additionally, continue to connect farmers to existing PES-type programs.

Specific Actions

1. Expand the Vermont Environmental Stewardship Program (VESP) as a means to educate, engage, and prepare farmers for a future PES approach.

Recommendation #7: Maximize access and use of existing programs to ensure farmers have capital to continue to implement practices or actions that lead to increase ecosystem services.

Specific Actions

1. To supplement existing WG activities supported by legislative funding and seek out, where appropriate, eligible and useful, additional sources of funding for learning and implementation.

Recommendation #8: Seek additional grant opportunities, where feasible, to advance the vision of the Working Group during its chartered lifetime.

2020 LEGISLATION CHARGES

1. a recommended payment for ecosystem services approach the State should pursue that benefits water quality, flood resilience, and climate stability, including ecosystem services to prioritize and capital or funding sources available for payments;
2. a recommended definition of healthy soils, a recommended method or systems for measuring soil health and other indicators of ecosystem health, and a recommended tool for modeling and monitoring soil health;
3. a recommended price, supported by evidence or other justification, for a unit of soil health or other unit of ecosystem service or benefit provided;
4. proposed eligibility criteria for persons participating in the program;
5. proposed methods for incorporating the recommended payment for ecosystem services approach into existing research and funding programs;
6. an estimate of the potential future benefits of the recommended payment for ecosystem services approach, including the projected duration of the program;
7. an estimate of the cost to the State to administer the recommended payment for ecosystem services approach; and
8. proposed funding or sources of funds to implement and operate the recommended payment for ecosystem services approach.