



Improving the pace, scope
and effectiveness of conservation

Counting on the Environment

A project funded by an NRCS Conservation Innovation Grant

Final Report

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Milestones in Ecosystem Credit Accounting

On August 4, 2009, twenty-five Stakeholders, including all necessary state and federal agencies, signed a consensus agreement approving an Ecosystem Credit Accounting System for a two year pilot in the Willamette Basin. Director level signatures followed in a Joint Statement of Agreement. The Accounting System includes: 1) Credit calculators for wetland, salmon, prairie, and water temperature credits, and 2) A standard credit issuance process that includes eligibility criteria, minimum design standards, verification rules, and registration criteria. On March 19, 2010, multiple credits types from the first pilot project were listed for sale under Counting on the Environment protocols on the Markit Environmental Registry with all project documentation. (<http://www.markitenvironmental.com>) July 15, 2010, the first group of land managers completed training to assist landowners in Counting on the Environment credit calculation and accrediting them to verify projects for agency approval.

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Executive Summary

The Counting on the Environment (COTE) project has built a marketplace for ecosystem services in Oregon's Willamette Basin. This marketplace expands the range of viable land management options available to farmers and foresters through incentivizing conservation and restoration in places that matter. Municipalities, developers, industries, and transportation agencies can now pay farmers and foresters for conservation actions that mitigate their unavoidable impacts through a single, and easily accessible, Ecosystem Credit Accounting System. As the foundation of a restoration economy, the pilot Ecosystem Credit Accounting System now operating in the Willamette will enable land managers to diversify and increase revenue by making conservation investments profitable.

In addition to food and fiber, working lands produce essential ecological services that are difficult, expensive, or impossible to replicate. Those services tend to be undervalued and overlooked, limiting options for private land managers to recover the costs associated with managing their lands to provide them. A wide diversity of crop types and land uses, coupled with a desire to improve mitigation under the Endangered Species Act and Clean Water Act, makes the Willamette Valley a valuable testing ground for an integrated marketplace for ecosystem services.

The Willamette Partnership (Partnership) is a non-profit organization formed in 2004 to increase the pace, scope, and effectiveness of conservation in Oregon's Willamette River Basin. Before Counting on the Environment, the Partnership created a marketplace for implementing the Willamette River temperature TMDL funded by an EPA Targeted Watershed Grant. Counting on the Environment built on this effort by expanding the market to include additional ecosystem currencies that capture a more complete array of conservation-related activities including in-stream practices, lowland practices, upland practices and specific parameters (e.g. water quality-temperature).

Key Counting on the Environment outcomes:

- Willamette landowners, mitigation bankers, conservation groups, municipalities, and all important natural resource agencies have greatly improved trust and an ability to accomplish goals together.
- Through one accounting system, land managers can now create credits for water quality trading, wetland mitigation banking, species conservation banking, Natural Resource Damage Assessment offsets, local land use permitting offsets, etc. This same accounting system also allows public and private investment to be better spent on ecological outcomes that are verified and tracked over time.
- An approved pilot crediting protocol, rapid assessment credit calculators, field data collection tools, a streamlined crediting process, and a central public registry make it possible and practical for land managers to generate multiple credits and bring those credits to market.
- Trained technical service providers are assisting landowners in calculating potential credits and verifying creditable conservation actions for agency approval.

| Objective | Task | Milestones | Delivered Results and Publications |
|--------------------------------------|--|--|--|
| An approved accounting system | Stakeholder group convenes, sets goals | Stakeholder kickoff meeting (farmers, bankers, agencies, conservation groups and other users) | Convening Report |
| | Existing accounting system analysis | Stakeholder workshop 2: identified assessment methodology criteria | <i>Crediting and Debiting Ecosystem Services</i> |
| | Credit Definition and currency Development | Stakeholder workshop 3, Sub group meetings, functions and indicators identified, calculators developed | Documentation and manuals for Salmon, Wetland, Temperature, and Prairie credits |
| | Crediting protocol development | | <i>General Crediting Protocol version 1.1, Verification Protocol version 1.0, Conflict of Interest Code; Confidential Business Information Code;</i> |
| | Method and protocol refinement | Stakeholder workshop 4, refined protocol methods based on testing and feedback | |
| | Agency and other stakeholder approval | Stakeholder workshop 5 25 stakeholder and director level agreements to pilot system for two years | <i>Signed Joint Statement of Agreement</i> |
| Accounting system interface | Database design and development | Completion of a working database as a model for online Registry development | MS Access database able to track multiple credits and assign serial numbers. |
| | Public Registry | Markit Environmental registry registering projects under COTE standards | http://www.markitenvironmental.com |

| Objective | Task | Milestones | Delivered Results and Publications |
|---------------------------------|---|--|--|
| User tools and materials | Field assessment and Credit Calculation tools | | Salmon (Excel Calculator; Field guide; Salmon Crediting Procedure; Salmon Calculator Data Entry Instructions; Salmon Method Data Sheets); Wetlands (Excel Calculator; ORWAP Manual; Wetland Crediting Procedure; ORWAP datasheets); Temperature (Shade-a-Lator Excel Calculator; Procedure for the Water Quality Temperature Calculator); Prairie (Excel Calculator; Prairie Data Sheets & |
| | Credit issuance tools | | Credit issuance forms |
| | | | Workflow, Screen shots, Site architecture, for online crediting platform |
| | Pilot projects | Site inventory, design alternatives, uplift calculations, comparative assessment of methods; | Six Pilot project summaries; Registered and sold credits from Half Mile Lane Restoration Project |
| | Training materials | First group finished 7 day training | Training Handbook |
| | Stakeholder process model and outreach | Workshop materials packaged as a usable model for unique local markets with regional standards | Counting on the Environment presentation package (Powerpoint, 4-page handout, Brochure); Getting from Here to There: A Process Guide to Building Ecosystem Credit Markets |

*Available upon request: Meeting materials, notes; Technical notes; Pilot selection criteria; A framework for Integrated market Assurances; Registry procedures document.

Defining Currencies

One necessary part of any market design process is defining the units of trade and how they are measured. Current markets have grown from existing institutions that split the environment into its constituent parts (e.g. water, land, and air), rather than dealing with it as an integrated whole. Thus, in order for farmers to sell the ecosystem services that they are uniquely positioned to produce, it is necessary to quantify the outputs of targeted, voluntary land management actions in units that match regulated drivers. The paper *Crediting a Debiting Ecosystem Services* addresses this need (Appendix A). It presents a conceptual framework for a tool chest of methods that will allow land managers to assess the environmental benefits and impacts of proposed and completed actions on the land. However, the fact that past policies and institutions have split up the environment does not mean that new market policy should not take a more holistic approach—looking at the whole ecosystem, but being able to articulate its component functions. Instead of using completely separate methodologies and indicators to assess wetland, water quality, or species conditions, Counting on the Environment metrics use a set of site indicators to calculate both the specific ecological functions provided by a site and its contextual value to the surrounding ecosystem. For most sites, calculating credits takes less than one day and does not require the use of desktop GIS software.

Because currency calculators are an essential part of any ecosystem market that need to be defined at the local level, Counting on the Environment metric development was designed to be a model that local stakeholders can repeat. First, a stakeholder Working Group collectively designed criteria for

evaluating existing ecological assessment methods.

Partnership staff then evaluated 33 prominent ecological assessment methods against the criteria. Staff used these evaluations, an assessment of market demand and opportunity, and interest in a diversity of ecosystem services to recommend the specific ecosystem credit types to include in Version 1 of the Ecosystem Credit Accounting System calculators (called Target Currencies) and the existing assessment methods from which the calculators would be built (called Foundational Methods). Calculator development is an iterative process. Version 1 of the Accounting System targets four currencies, but it is assumed that methods will be regularly revisited and adapted based on feedback from users and new available science. Work is already underway to add additional currencies.

Version 1 targeted four currencies based on their ability to meet watershed goals, engage private lands, and be building blocks for adding additional currencies to the system:



Functional acres of wetlands was chosen as a currency due to the existing market for wetland mitigation and to represent lowland habitat types. The wetland calculator is based on Oregon Rapid Wetland Assessment Protocol (willamettepartnership.org/ecosystem-credit-accounting/wetlands)



Functional linear feet of salmonid habitat was chosen to meet Endangered Species Act requirements and represent instream habitat types. The Salmon Calculator is based on the Ecometrex salmon method (willamettepartnership.org/ecosystem-credit-accounting/salmon-habitat).



Kilocalorie reductions of instream temperature from riparian planting was chosen as a currency to incorporate existing trading under the Total Maximum Daily Load and National Pollution Discharge Elimination System and to represent water quality currencies. The Water Quality-Temperature Calculator is based on the Oregon Department of Environmental Quality's (DEQ's) HeatSource Shade-a-lator model (willamettepartnership.org/ecosystem-credit-accounting/water-quality-temperature).



Functional acres of upland prairie was chosen as a currency to address Oregon's fast declining native prairies and to represent upland habitat types. The Prairie Calculator was developed by ecologist Paul Adamus and the Counting on the Environment Prairie sub-group. (willamettepartnership.org/ecosystem-credit-accounting/upland-prairie-habitat).

With lowland, instream, riparian/water quality, and upland credit types represented, adding additional currencies to the accounting system will be a faster process for stakeholders and technical staff in the future. For example, the Natural Resource Conservation Service's Nutrient Trading Tool will soon be validated for Oregon crop types, and more habitat currencies are underway. The next section addresses the field and technical tools that allow site indicators to be translated to a functional score, as well as the web-enabled tools for credit issuance and registration.

Lessons learned:

Stakeholders in the Willamette identified that an ideal metric has certain qualities: it

calculates overall ecosystem improvement as well as individual functions; it incorporates site context; it is repeatable, transparent, simple, inexpensive, and reasonably precise; and it covers various landscapes. Many ecosystem functional assessments exist, but most must be tailored to local ecosystems. Given existing methods, it is often possible to quickly and effectively develop currencies through a four step process¹:

Step 1: Evaluate existing methods

Step 2: Select foundational methods

Step 3: Technical development and review

Step 4: Test and finalize

Most importantly, assessment metrics should measure the things that local conservation strategies want to promote. While metrics are based on science, what to measure is tied to conservation priorities.

¹ For more on this sub-process of Counting on the Environment see *A Process Guide to Building Ecosystem Markets*

Field Tools

As mentioned above, stakeholders identified that a practical assessment method would be rapid, repeatable, and sensitive to changes in ecosystem function. Based on guidance from stakeholders and users, the Willamette Partnership created field assessment tools and field guides for land managers to collect data needed for the four initial credit calculators. Counting on the Environment's approved methods are all rapid visual assessments of key site indicators that are used to estimate a functional score.

National and state goals for “no net loss” of wetlands pertain not only to wetland acreage but also functions and values that wetlands provide naturally². The Ecosystem Credit Accounting protocol for wetlands is linked closely with the Clean Water Act and implementation of 404 programs for the US Army Corps of Engineers and Oregon Department of State Lands. Wetland credits are calculated using the Oregon Rapid Wetland Assessment Protocol (ORWAP), which computes a score for 16 different wetland functions, based on indicators that are assessed both in the office and in the field. The *ORWAP Manual* contains the instructions for performing a rapid wetlands assessment, provides an overview of the assessment procedure, some of the important assumptions and limitations involved in using the procedure, and a comparison to Oregon's hydrogeomorphic wetland assessment methods. It also provides step-by-step guidance on each of the tasks and types of data collection needed. *The ORWAP Calculator* is an Excel spreadsheet that captures data collected in the office and in the field. The *ORWAP Data Sheets* are printouts

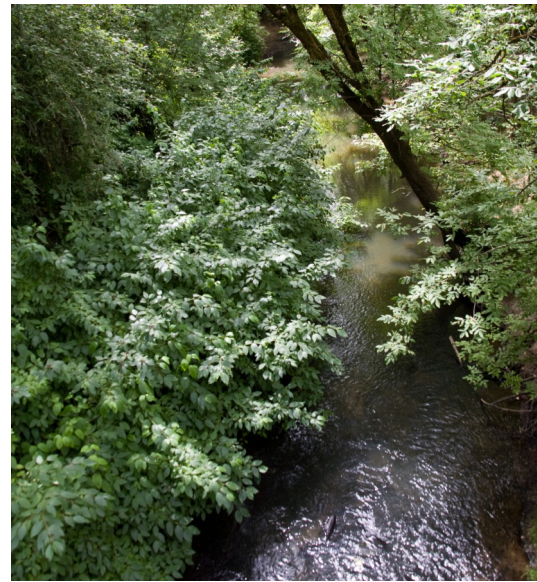
of the data entry part of the Calculator. The *Wetland Crediting Procedure* gives guidance on how to translate outputs from functional assessments (scores from the Calculator) into functional acres to be used as tradable wetland credits and debits. All of the wetland calculation manuals, documents, and tools can be downloaded at www.willamettepartnership.org/ecosystem-credit-accounting/wetlands.



Improving salmon habitat is one of the primary goals of a large amount of regulatory activity in the Northwest. The Salmon Credit Calculation Method calculates scores for six ecological functions relevant to optimal habitat for salmonid species using information about the surrounding landscape and the stream. Most data is collected in the field, from site-level, visual assessments. The output of the metric is a weighted linear foot that is based on the percentage of optimal functions performed by the stream and near-stream habitat. This output is used to calculate the ecosystem credits (or debits) available based on current

² Adamus, P., J. Morlan, and K. Verble. 2009. Manual for the Oregon Rapid Wetland Assessment Protocol (ORWAP). Version 2.0. Oregon Dept. of State Lands, Salem, OR.

conditions relative to proposed conservation or development actions. The *Salmon Crediting Procedure* describes each of the functions and their significance to salmon habitat, the set of rules that apply to using the calculator, and a description of how to calculate a salmon habitat credit. The *Salmon Method Calculator* is an Excel spreadsheet using data collected in the office and in the field. *Calculator Data Entry Instructions* give guidance for entering data in the Calculator. *The Salmon Method Functional Equations* provides the formulas used to calculate the numerical values of the indicators. *The COTE Map Unit Attribute Datasheet* contains the sheets to record data in the field. The attributes listed on the datasheets correspond to the terrestrial and aquatic indicators detailed in the *Salmon Crediting Procedure*. The *Field Guide for Streams* contains quick explanatory descriptions, definitions, diagrams and photos that help with data collection in the field. All of the salmon calculation manuals, documents, and tools can be downloaded at www.willamettepartnership.org/ecosystem-credit-accounting/salmon-habitat.



The Willamette River Total Maximum Daily Load sets limits on the hot water point sources can discharge into the river. Warm streams are a major limiting factor for salmon recovery. Rather than build expensive infrastructure to cool water, point sources can restore riparian forest and augment in-stream flows to reduce the equivalent amount of thermal load. The “Shade-A-Lator” model developed by Oregon’s Department of Environmental Quality converts riparian vegetative structure into measures of thermal load reductions in the water. The *Shad-a-lator Data Entry Instructions* provides step-by-step instructions for the *Shad-a-lator Model*, calculating thermal load reductions, in kcal/day/ft, from riparian shade restoration projects. The field data required to run the Shad-a-lator is recorded on the *The COTE Map Unit Attribute Datasheet* and transferred into the Shad-a-lator. All of the temperature calculation manuals, documents, and tools can be downloaded at www.willamettepartnership.org/ecosystem-credit-accounting/water-quality-temperature.

Upland prairie is one of the rarest habitat types remaining in the Willamette Valley. As a result, it provides homes and habitat for several listed species, including Kincaid's lupine and Fender's blue butterfly. The Upland Prairie Calculator determines the relative importance of a prairie site and its ecological integrity as prairie habitat using a habitat functional assessment. While the *Prairie Calculator* itself is an Excel spreadsheet, the *Procedure for Upland Prairie Credit Calculator* describes its purpose and provides step-by-step instructions for its use. The *Prairie Credit Calculator Field Guide* includes the field data sheets for the Prairie Calculator and a helpful photographic guide to the plants of the Upland Prairies of the Willamette Valley. All of the prairie calculation manuals, documents, and tools can be downloaded at www.willamettepartnership.org/ecosystem-credit-accounting/upland-prairie-habitat.

credit calculators. Tools and metrics can always be improved. A market needs a structured way to adaptively manage tools that balances generation of new information with the predictability market actors need.

Streamlining this process is necessary in order to make markets as accessible, transparent, and effective as possible. New developments in technology, funded through Counting on the Environment, are making these supporting objectives a reality in the Willamette and have peaked the interest of others interested in making markets work around the country.



Lessons learned:

Each of the Version 1 metrics has been used and reviewed through validation and piloting. Adjustments have been and will continue to be made to improve the clarity and usability of field tools and the functionality of

Market Tools

Calculating ecosystem credits and making them available for sale is an inherently complex process, but web-enabled tools can go a long way toward simplifying it for both land managers and credit buyers. The Willamette Partnership is committed to streamlining this process in order to make markets as accessible, transparent, and effective as possible. New developments in technology, funded through Counting on the Environment, are making these supporting objectives a reality in the Willamette and have peaked the interest of others interested in making markets work around the country.

Technology development for Counting on the Environment began with a broad assessment of existing technologies with potential to serve its objectives. This assessment was done by an international group of software developers convened by the Partnership for two roundtable discussions to create a vision for interoperable tools that, when packaged together, support market integration across ecosystem service types and geographies.

Based on this vision, Counting on the Environment stakeholders agreed that two pieces of internet-based technology would be necessary to support the marketplace: an Ecosystem Crediting Platform and a Registry. The first takes land managers through the credit creation process, translating actions on the ground into tradable credits. The second tracks the custody of these credits over time. The Willamette Partnership selected The Other Firm, a Portland-based software company, to deliver the crediting platform and Markit Environmental (Formerly TZ1) to deliver a registry.

Partnership staff, working with The Other Firm, completed the first phase of the Ecosystem Crediting Platform's development in December of 2009. It resulted in highly-detailed site architecture and work flow documents that serve as blueprints for the actual coding of the software. An operational version of the platform is likely to be available in November 2010. The platform leads project managers through:

- Establishing baseline conditions at a restoration or impact site
- Evaluating and formalizing project design scenarios
- Managing third-party verification
- Completing project certification
- Facilitating project registration
- Aiding with ongoing monitoring

Markit Environmental Registry (MarketEnvironmental.com) is the current registry provider for credits generated through the Willamette Partnership's General Crediting Protocol. This Registry went live in the Spring of 2010. It is fully-operational and ready to process credits from projects anywhere in the Willamette Basin. The Partnership had previously completed a registry prototype through a contractual relationship with Parametrix, Inc. This initial registry took the form of a Microsoft Access Database that could serialize and track multiple credits and credit types emerging from a single restoration site. While less polished than the next generation Markit registry, it represents the first successful software product created by the Partnership that could be used by all market participants to transparently and effectively track credits comprehensively at a single location.

Counting on the Environment Registry Requirements:

- Manage multiple ecosystem services credit types in one registry system
- Manage functional credit accounting
- Interfaces with credit calculation tool and other infrastructural platforms

Simply put, the registry is a centralized system that tracks the custody of credits in real-time. This removes any ambiguity over what person or organization is responsible for managing issued credits and ensures that no single credit is used to offset multiple environment impacts. Furthermore, as the General Crediting Protocol allows for multiple types of ecosystem service credits to be sold from single restoration actions, the registry can account for these complex relationships by linking multiple credits from single pieces of geography according to defined rules.

Lessons learned:

Usable web-based tools make markets accessible to various users. With respect to crediting and tracking, all markets need many of the same things. It is a constant challenge to ensure integration of technology platforms and develop funding models to sustain maintenance of technology tools. In order to insure consistency and funding, unique local markets can share the cost of crediting and registry infrastructure regionally or nationally. Building Database, Registry and Crediting Platform technology is complex. However, from a user's perspective, these tools will greatly simplify the process through which land-mangers may be paid for conducting the right kinds of restoration in the right places.

A Standardized Credit Issuance Process

Standard rules, methods, and processes are essential for legitimately translating ecological data into a “credit” that can legally offset an impact. *The General Crediting Protocol: Willamette Basin Version 1.1* (Appendix A) is the core document governing the Counting on the Environment standard. It provides the basic process and framework land managers need to develop, sell, and buy ecosystem credits—leading readers through the workings of an integrated, functions-based accounting system. As land managers produce multiple credit types, this credit issuance process provides a single point of entry to ease approvals from the multiple agencies involved. The system begins with Willamette Basin-specific eligibility requirements for both buyers and sellers. It finishes with trading rule’s governing credit estimation, verification, and ongoing monitoring.

Accompanying the General Crediting Protocol is a supporting paper trail for credit issuance that moves a project through validation, credit estimation, verification, certification, and registration collecting the necessary data and signatures such that any number of approved credit types can be issued through the single process. The Appendix C to this report includes this paper trail for the Half Mile pilot project. The following represents a description of how a land manger (in this case the Half Mile project sponsor) would move through the credit issuance process.

The Half Mile project is a 60-acre farm located on Gales Creek in the Tualatin River Basin, a tributary to the Willamette River. The farmer has a native nursery operation and approached the project sponsor, the Department of State Lands to start a mitigation bank. The project will reconnect a ditched stream to its floodplain, halt an

eroding bank, restore instream habitat, restore wetlands, and plant a diversity of native habitat types to create *wetland, salmon, and temperature credits*. State Lands will own the credits, and the landowner was compensated through a purchased conservation easement over about 30 acres of the property. The remaining 30 acres will remain in nursery, using the restoration area as a source of seed and cuttings.



Step 1. Together, State Lands and the landowner filled out a *Self-Validation Checklist for Credits*—some basic questions about ownership, past land management, site context, and proposed actions—and sent it to the Willamette Partnership (the Market Administrator). The Partnership sent back a *Validation Notice* signifying that the site was likely eligible to create credits. The Partnership does this for both credit and debit sites. The *Validation Checklist for Debits* records permits and documentation of avoidance and minimization for impacts. It also records the types of impacting actions and the types of potential debited ecosystem function

currencies. The developer (someone like a county dept. of transportation) attests that he or she has the necessary permits and is in compliance with all laws and regulations.

Step 2. State Lands then used the field tools and credit calculators to calculate a baseline score and a projected score based on 20 years of ecological improvement after restoration. When project designs were finished and potential credits calculated, State Lands submitted a *Credit Estimate* attesting to the quantity and type of credits to the Willamette Partnership, and that they were ready for third party verification.

Step 3. The Willamette Partnership then assigned a third party verifier (for this project the Army Corps and Willamette Partnership verified credits while the Partnership was training and accrediting its first verifiers). The *Verification Protocol* provides standardized, specific guidance on the review and assessment of credit and debit projects. Verifiers assessed the accuracy of the Credit Estimate and Validation Check-List using agreed upon criteria to attest that it was free of material misstatements and conformed to



accounting and credit generation standards. The credits for the Half Mile project were verified, and the verifiers filed a *Verification Report* that contains a summary which will be available to the public, an opinion on the credit estimates, and a log of activities and findings to the Willamette Partnership (as the Market Administrator)³. The Partnership then gathered the needed agency signatures on the *Agency Certification* form and helped State Lands send all documents as a package to the Markit Environmental Registry to issue credits as performance targets were met. When buyers wanted to buy the released credits, State Lands settled on a price and requested that the Partnership and relevant agencies issue an *Approval of Sale*. With this approval, Markit moved credits from the State Lands account to the buyer's account, and then into a retired credit account as they were used to offset a permitted impact.

Lessons Learned:

The credit issuance process can be separated from ecosystem uplift calculations. An effective credit issuance process focuses on providing incentives to do the right thing, more than guarding against unlikely malicious intent. It is very costly to attempt to deal with every possible problem upfront; a minimum level of checks against bad behavior will catch it and allow the program to adjust. Assurances can incentivize doing the right things and reduce risk at various stages of credit issuance. Some risks may be avoided through eligibility criteria or verification; others may be compensated for by a reserve pool. Risk is best managed in small pieces throughout the process creating a comprehensive policy package.

³ The complete package of credit issuance documentation for the Half Mile pilot project are included as Appendix C and available online at www.markitenvironmental.com

Using the Willamette's protocols and issuance forms as a template, local stakeholders can develop their own integrated credit issuance process through the following steps⁴:

- Step 1:** Establish key steps of process (e.g. eligibility, calculation, verification, registration)
- Step 2:** Discuss assurances (e.g. prioritization, additionality)
- Step 3:** Place assurances at appropriate step of process (e.g. additionality criteria for eligibility)
- Step 4:** Finalize Agreement on a General Crediting Protocol

⁴ For more on design process, see the *General Crediting Protocol: Willamette Basin Version 1.1* and *A Process Guide for Building Ecosystem Markets*

The Counting on the Environment Stakeholder Process

The Willamette approached stakeholder involvement by building a network of relationships needed to secure approval of an accounting system, develop needed market infrastructure and user support tools, and operationalize the system to trade in real credits and debits. The Counting on the Environment process was designed as a model for ecosystem market design that could be refined and used in other watersheds around the country. To this end, the process was rigorously documented and analyzed. All agenda items, action items, recommendations, briefs, meeting minutes, stakeholder feedback, and other meeting materials are available from the Willamette Partnership. A summary of process components, decision points, and recommended market standards can be found in *Building a Market for Functional Ecosystems* (Appendix C).

Working toward one accounting system for multiple credit types requires trust and active cooperation among multiple agencies and other stakeholders. The market design process was facilitated in a way that improved working relationships. Participant feedback shows that the Counting on the Environment process greatly improved the level of trust among Working Group participants as well as perceptions about the group's ability to get things done. Twenty-three stakeholders returned process evaluation surveys reporting that before the process 70% agreed that the parties trusted each other. Afterwards, 90% agreed that the parties trusted each other. Similarly, before the process, 65% of respondents agreed that the parties were able to work cooperatively, and afterwards 90% agreed that the parties were able to work

cooperatively. All respondents agreed that the process helped them gain a better understanding of the other participants' views and perspectives. All participants also agreed that they are more likely to be able to work together in the future⁵. Some stakeholders did feel the cost of the process was high compared to other alternatives.

Stakeholder Roles in the Counting on the Environment Process

Stakeholders engaged in credit calculator, tool, and credit issuance process development in several ways. A Working Group of twenty-seven stakeholders selected to represent relevant agencies, governments, nonprofits, land managers and regulated communities met in six workshops to guide the project overall, engaging heavily on the credit issuance process. Before and between Working Group meetings, the Willamette Partnership conducted numerous individual meetings, usually meeting with every member of the Working Group. A Coordinating Team of seven highly engaged members of key agencies and conservation groups on the Working Group met bi-monthly to brainstorm options and make general recommendations for the Working Group. Through the course of the Counting on the Environment process, the Coordinating Team produced over twenty briefs and other reference publications and sometimes more than thirty recommendations for decision points for a single Working Group meeting. Each currency used two Focus Group meetings of technical experts to vet and validate metric construction and the conversion of functional scores into credits.

⁵ Oregon Consensus Process Evaluation Report – Willamette Partnership Counting on the Environment (OC08-007) (June 7, 2010)

Neutral facilitators from Kearns and West and Oregon Consensus played an integral role in project management and coordination, and facilitated the Working Group sessions. This allowed Partnership staff to lead technical discussion and move rapidly through a lot of decisions in a short amount of time.

Inclusion of EQIP-eligible producers

One EQIP-eligible producer who is also a wetland mitigation banker sat on the Working Group. The landowner on the Half Mile Lane Pilot Project may enroll some of their other fields in EQIP and run Oregon's first Salmon Safe-certified native plant nursery. All work products make it easier for EQIP-eligible producers and other landowners to participate more easily and effectively in markets for ecosystem services.

Piloting

After developing the accounting system, with calculators and crediting protocols as good as they could get on paper, agencies and their leadership approved piloting the system for two years with real credit and debit sites. To date, six pilots were selected by criteria developed by the Working Group. Five sites are on private land, one on public land. Project sponsors included state agencies, university-owned lands, and a non-profit group. One of the projects has generated and sold credits for compensatory mitigation. The other pilots are at different stages of generating or retiring credits for conservation purposes.

The Half Mile Lane project (referenced above) involves rechanneling of a ditched tributary of Gales Creek, restoring wetland hydrology, fish barrier removal, large wood placement instream, riparian planting, and change in crop type. The site is a 303d listed stream with an ESA-listed steelhead trout run. The land owner runs a native plant nursery; raising native bare root stock in the buffer zone and collecting seed and cuttings from the restoration site. Easements, permits, and bank instruments were finalized and on the ground work began in June 2010. The project sponsor has found buyers with development impacts for all the wetland and salmonid credits from the project.



The Johnson Creek, Mohawk Creek, and Woods Creek projects involve invasive removal and riparian planting using Section 319 water quality grants and private foundation funds on private land. Woods Creek also involves large wood placement and alcove restoration. Initial restoration work is scheduled to be complete August 2010 and The Freshwater Trust is having credits for salmonid habitat and water quality registered and retired from these sites for conservation purposes. The sites are all 303d listed priority streams for achieving TMDL goals, and Woods Creek and Mohawk Creek are Nature Conservancy priorities.



The Zena Forest project involves oak woodland, oak savannah, wet prairie, and riparian restoration on rural agricultural and forestry land funded by a mix of public and private funds. It is expected to create benefits for five listed species, water quality—Nitrogen, Phosphorus, Sediments, Temperature—riparian, stream, and prairie habitat, and forest carbon. The site is a Nature Conservancy priority and includes five “Strategic Habitats” identified in the Oregon Conservation Strategy. The owner, Willamette University, is interested in using the project to test

currencies and train students on Counting on the Environment methodologies. The Gales Creek Enhancement Project involves instream placement of trees and root wads for salmonid habitat funded by the Oregon Watershed Enhancement Board and Oregon Department of Forestry. The site is a Nature Conservancy priority and includes two “Strategic Habitats” identified in the Oregon Conservation Strategy. All credits will be registered and retired for conservation purposes.



approved programmatically statewide. After full scale implementation, the Willamette Partnership will continue to refine and adapt calculation methods and crediting standards to meet changing needs and wider geographies.

The Willamette Partnership will also run Salmonid and Prairie calculators on forty additional sites to test the validity of the credit calculators over time, and ORWAP has been run on over 200 sites testing for repeatability and sensitivity. Results from these tests and pilots will be compared with crediting and debiting methods where they exist and lessons have already informed refinement of the calculators, field tools, credit issuance process, and the General Crediting Protocol itself. The piloting phase of the Counting on the Environment process represents a primary form of adaptive management before it is

Concluding Lessons Learned

An accounting system can be used to direct public and private investment to the highest priority locations and actions by shifting investment to ecological outcomes. Private farm and forest lands are uniquely positioned to deliver these ecological benefits.

- Building a market requires well-defined goals—accounting system design works best when a network of stakeholders agree on ecological goals and a defined process for designing a market to achieve those goals. You should be able to say, “What does my watershed need.”
- Ecological priorities, credit calculation metrics, and specific assurances are necessarily local decisions. It will be difficult to standardize these nationally for most water and biodiversity markets, but there can be templates that facilitate these local decisions.
- Emerging markets need not start from scratch—many markets need the same things. Models and shared regional infrastructure supporting markets is available. This includes credit issuance processes, verification protocols, technology tools, registries, and templates for credit calculations.
- Setting the stage matters for an effective process—much of the work in a successful process occurs before and between formal meetings, establishing the vision, milestones, and effective network of stakeholder representatives. Spending the time to convene the right stakeholders, and engaging them within a bounded time period pays off in the form of increased trust, better consensus, easier implementation, and better ability to deal with adaptive management..

- Both program design and operations need mechanisms for adaptive management that balances predictability for market actors and recognition that market designs and science are constantly evolving with experience.

Next Steps:

The Ecosystem Credit Accounting System is a foundation for a restoration economy in the Willamette. However, to see restoration on private lands at scale we need more currencies, more demand for conservation benefits, and regionally shared infrastructure.

Increasing demand comes in two forms. First, public and private funds spent on conservation need to invest in ecological outcomes such as the kinds calculated and tracked by the accounting system. The accounting system was built to the rigor demanded by compliance markets. Additional work is needed to optimize it for public and voluntary buyers. Second, potential offset buyers must be realized—many developers and municipalities are still investing billions in grey infrastructure for problems that are solved more effectively, cheaper, and more sustainably by green infrastructure. Farm and forest owners have the capacity to provide this green infrastructure when potential credit buyers become real.

The Willamette Partnership and its partners are actively developing additional currencies—adding to the portfolio of credit available from conservation actions, more habitat types and a generalized stream protocol, adapting the Nutrient Trading Tool, and integrating with existing carbon markets. The foundational methods for these currencies, the stakeholder

process model and credit issuance standards are among the resources that the Willamette Partnership is actively sharing with energetic new stakeholder groups aspiring to emulate and improve on the Counting on the Environment model thought the Northwest.

Appendices

Appendix A - An Approved Accounting System

- A1. Signed Joint Statement of Agreement
- A2. General Crediting Protocol version 1.1
- A3. Verification Protocol
- A4. Crediting and Debiting Ecosystem Services

Appendix B - Accounting System Interface

- B1. Workflow, Screen shots, and Site Architecture for Crediting Platform
- B2. Registry Screenshot
- B3. Database Screenshot

Appendix C - User Tools and Materials

- C1. 6 Pilot Project Summaries
- C2. Credit Issuance Forms for Half-mile Lane
- C3. Getting From Here to There: A Process Guide to Building Ecosystem Credit Markets