



Counting on the Environment

A project funded by an NRCS Conservation Innovation Grant

Workshop #3

Ecosystem Credit Calculator

Version 1

April 17, 2009

8:30 a.m. – 4:30 p.m.

Willamette University
900 State Street
Salem, Oregon

Questions to David Primozych Primozych@willamettepartnership.org
Or Bobby Cochran cochranb@cleanwaterservices.org

Table of Contents

I. Welcome, Meeting Objectives, Agenda, Action Items

| | |
|--|----|
| Agenda | 2 |
| Directions & Parking information | 4 |
| Willamette University Map | 5 |
| Working Group Representation | 6 |
| Technology Update | 8 |
| February 3 rd Action Items & Meeting Summary | 9 |
| Focus Group Summaries | 20 |

ATTACHED AS SEPARATE DOCUMENTS

II. Commenter's Checklist

III. General Crediting Protocol and Assurances

IV. Field Guide and Pilot Summaries



Counting on the Environment

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WORKSHOP #3 AGENDA

Friday, April 17, 2009

8:30 am – 4:30 pm

**Willamette University, Montag Den
Salem, OR**

Meeting Objectives:

- *Seek agreement by all participants on the approach and indicators for the Integrated Ecosystem Credit Calculator;*
- *Provide feedback on the discounting factors applied to credit estimates to account for contextual value, time, and risk;*
- *Provide feedback on the package of assurances for credits;*
- *Develop a list of action items that need to occur before the June 4 Working Group meeting, so that the group can approve the credit calculation methods in concept.*

8:30 – 9:00

I. Welcome, Meeting Objectives, Agenda, Action Items

A. Introductions

(Attachments: Working Group Reps)

B. Overview and Updates

- Update on technology roundtable 2

(Attachments: Technology Update)

C. Review and approval of Workshop 2 Meeting Summary and Action Items *(Attachments: Action Items and Meeting Summary)*

D. Recap of progress since Workshop 2

(Attachments: Focus Group and Pilot project summaries)

9:00 – 10:00

II. Present the DRAFT Integrated Ecosystem Credit Calculator

(Attachments: DRAFT calculator documentation)

A. The approach

B. Collecting data

10:00 – 10:15

Break

- 10:15 – 12:00 III. Continue with the Integrated Ecosystem Credit Calculator
(Attachments: DRAFT calculator documentation)
- A. The algorithms that translate indicators into functional scores
 - B. Discounting functional scores to reach an estimate of credits
 - C. Question/answer and group discussion
- 12:00 – 1:00 **Lunch** (will be provided for Working Group members)
- 1:00 – 3:00 IV. Applying a package of integrated assurances
(Attachments: An integrated package for credit assurance)
- A. An integrated assurances package
 - B. Question/answer and group discussion
- 3:00 – 3:15 **Break**
- 3:15 – 4:00 V. Developing action items needed between April and June
- A. Update on planned work program elements
 - B. Discuss needed steps for Working Group member organizations to approve in concept the final draft of the methodology in June
- 4:00 – 4:30 VI. Plan for Upcoming Meetings, Next Step Tasks and Summary
- A. Review of timelines, milestones, and process elements
 - B. Next workshops (June 4, August 4)
 - C. Review and confirm action items or follow-up tasks generated during the meeting
 - D. Summary and acknowledgements
- 4:30 Adjourn

Willamette University, Salem Oregon

Montag Den

Directions to the Campus

From I-5 (North or South)

1. Take the Highway 22 exit (number 253).
2. At the first light, head west (a left turn for those coming from the south, a right when coming from the north).
3. Stay on Highway 22 for about 1.5 miles.
4. As you pass 17th Street, you'll start up an overpass.
5. At the top of this overpass there is an exit to the right.
6. Take this exit (Willamette University is indicated on the sign).
7. Keep left as the exit divides.
8. You'll see a green Willamette University sign on your right — pass by, and continue to Winter Street.
9. The guest parking lot is on the northeast corner of Bellevue and Winter Streets, entrance on Winter Street.

From the Oregon Coast

1. Take Highway 18 east from Lincoln City (off Highway 101).
2. Stay on Highway 18 for about 27 miles.
3. Take the Salem exit (Highway 22).
4. Stay on Highway 22 for about 26 miles.
5. Highway 22 will take you into downtown Salem, crossing a bridge over the Willamette River, onto Center Street.
6. Turn right on High Street.
7. Turn left on State Street.
8. Turn right on Winter Street.
9. Just past Mill Street, turn left into the guest parking lot.

From Central Oregon

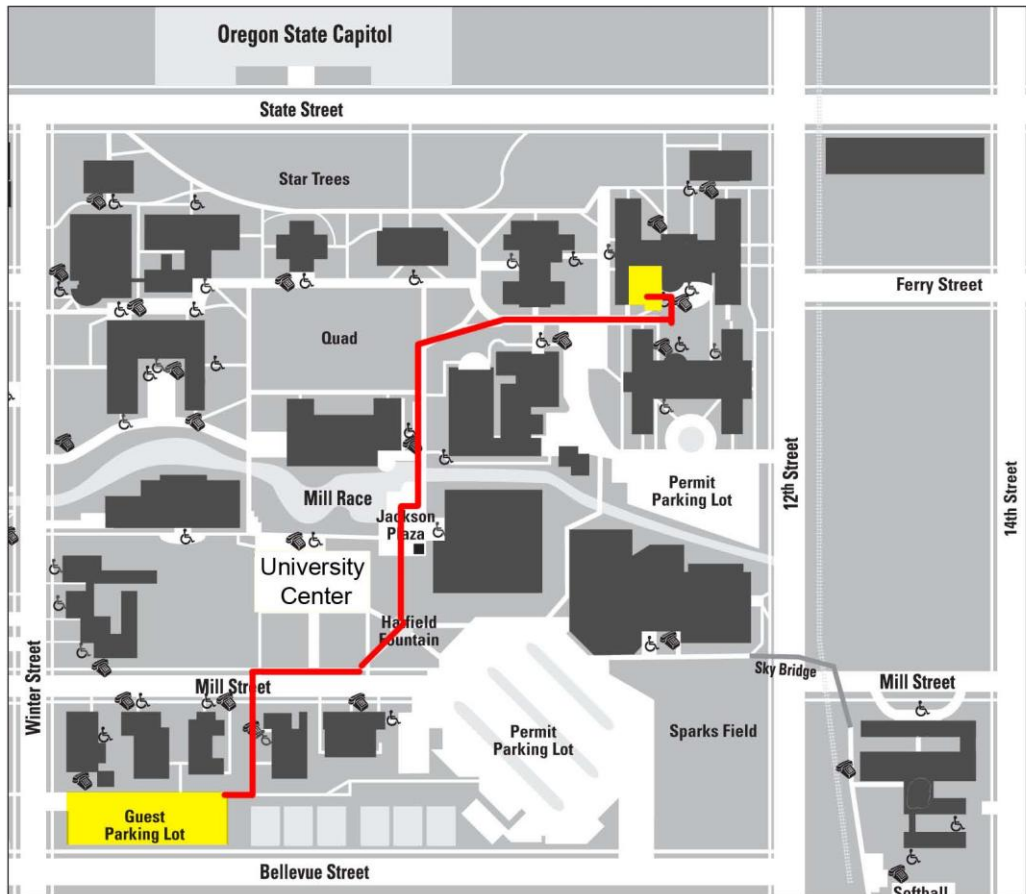
1. Take Highway 22 west.
2. After your pass over I-5, follow the I-5 directions above.

FOR PARKING:

We have 21 spots reserved on a first come first serve basis at no charge in the Guest Parking Lot at the northeast corner of Winter and Bellevue streets. Please contact Joni Shaffer jshaffer@willamettepartnership.org to reserve a parking place in advance as these spaces fill up.

Metered and un-metered city parking is also available on Winter, State and Cottage streets nearby.

Willamette University



From the guest parking lot, you can head to the back of the lot and walk between the buildings and across Mill Street, pass the University Center, pass the Eagle Fountain, go through Jackson Plaza, cross over the Mill Stream, go around Rogers Music Hall, turn right and go straight, when you see steps going down to the left take those down and turn left into the Montag Den.

WILLAMETTE PARTNERSHIP
COUNTING ON THE ENVIRONMENT
WORKING GROUP REPRESENTATION

| ORGANIZATION/AGENCY | LEAD REPRESENTATIVE | ALTERNATE REPRESENTATIVE | TEAM MEMBERS |
|---|-----------------------------|---------------------------------|---------------------|
| City of Albany | Diane Taniguchi – Dennis | | |
| City of Eugene | Eric Wold | | |
| City of Portland | Mike Reed | | |
| Cascades West Council of Governments | Cynthia Solie | | |
| Clean Water Services | Charles Logue | | |
| Defenders of Wildlife | Gina LaRocco | Sara Vickerman | |
| Ecotrust | Sarah Kruse | | |
| Office of Gov. Ted Kulongoski | Jane Bacchieri | | |
| Oregon Trout | Brett Brownscombe | | |
| Institute for Natural Resources | Jimmy Kagan | Sally Duncan | |
| Mud Slough Wetland Mitigation Bank | Mark Knaupp | | |
| The Nature Conservancy | Cathy Macdonald | | |
| National Oceanic and Atmospheric Administration | Marc Liverman | | |
| Oregon Dept. of Agriculture | Dave Wilkinson | | |
| Oregon Dept. of Environmental Quality | Ranei Nomura | | |
| Oregon Dept. of Fish & Wildlife | Mike Pope | | |
| Oregon Dept. of Forestry | Mike Cafferata | Jeff Brandt | |
| Oregon Dept. of Land Conservation & Development | Katherine Daniels | | |

| ORGANIZATION/AGENCY | LEAD REPRESENTATIVE | ALTERNATE REPRESENTATIVE | TEAM MEMBERS |
|---|----------------------------------|---------------------------------|----------------------------|
| Oregon Dept. of State Lands | Kirk Jarvie | | |
| Oregon Dept. of Transportation | Bill Warncke | | |
| Oregon Dept. of Water Resources | Debbie Colvert | Bill Ferber | |
| Oregon Watershed Enhancement Board | Ken Bierly | | |
| U.S. Army Corps of Engineers | Bill Abadie | | |
| U.S. Environmental Protection Agency | Yvonne Vallette | | |
| U.S. Fish and Wildlife Service | Joe Zisa | | |
| U.S. Forest Service | Robert Deal | | |
| U.S. Natural Resources Conservation Service | Meta Lofstgaarden | Russ Hatz | |
| Willamette Partnership | David Primozich Bobby Cochran | | Mac Martin Joni Shaffer |



Counting on the Environment

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Technology Working Group: Update from March

On March 13th 2009 the Willamette Partnership organized a second Technology Roundtable meeting to discuss the tools needed to operate a market for ecosystem services.

During the first Technology Roundtable those in attendance were enthusiastic about the prospect of aiding in the development of a functioning market for ecosystem services, but asked that the Partnership first generate a clear outline of the process we expect to use to create ecosystem service credits and exchange them. By producing such a work-flow, the participants felt they would be better positioned to identify what gaps might be filled with existing technologies and what gaps might need new technology to fill them. This work-flow was presented at the second meeting. The overall response to it was positive and the Partnership is currently working to follow-up on comments received during the meeting.

The work-flow showed the major procedural steps that the Partnership envisions as necessary for a market for ecosystem services to function. A consensus exists over the general types of tools such a market requires. They include a web-based user interface, credit calculator and credit registry. Taken together, such a package would allow those with an interest in participating in markets to learn about them, go through a verifiable credit issuance process and then track credits as they are exchanged or retired over time. There is not, however, consensus over the exact roles of each of these tools. Questions about where one tool ends and another begins, who should be responsible for developing them, and how they can work seamlessly remain to be answered.

The Registry was not identified as a gap. Those in attendance believed that existing technology could be modified to fit the Partnership's needs. The Partnership has since issued an RFQ for registry services. The calculator was identified as a gap, but not a significant hurdle. The ability to take information collected at a project site and process it using a database application appears to be a straightforward programming exercise that will require funding, but might be accounted for by other market participants. What does remain as a considerable gap and hurdle is creating the user interface, and all the necessary standards, for connecting marketplace participants and marketplace tools together so that they work together in an efficient and effective manner.

Partnership staff are currently formulating a plan for addressing this gap and expect to have a clear path forward, through which we can use our limited grant funds, by this summer.



February 9, 2009

MEMORANDUM

TO: Counting on the Environment Working Group Members

FROM: Debra Nudelman and Peter Harkema, Kearns & West

SUBJECT: Counting on the Environment – February 3, 2009 Meeting Action Items

Thank you for your participation and efforts at the Counting on the Environment Working Group meeting held February 3, 2009 at the Chemeketa Community College in Salem, Oregon. This memo includes the upcoming meeting dates, agreed-upon action items, flip chart notes, and meeting summary.

| Upcoming Meeting Dates | Who | Location |
|--|---------------------------|--------------------------------------|
| <ul style="list-style-type: none"> • <u>February 20, 2009</u> 9:00 am – 11:00 am | Prairie Focus Group | Clean Water Services-Durham Facility |
| <ul style="list-style-type: none"> • <u>February 20, 2009</u> 1:00 pm – 3:00 pm | Wetlands Focus Group | Clean Water Services-Durham Facility |
| <ul style="list-style-type: none"> • <u>February 20, 2009</u> 3:00 p.m. – 5:00 p.m. | Water Quality Focus Group | Clean Water Services-Durham Facility |
| <ul style="list-style-type: none"> • <u>February 23, 2009</u> 1:00 pm – 3:00 p.m. | Salmonid Focus Group | Clean Water Services-Durham Facility |
| <ul style="list-style-type: none"> • <u>April 17, 2009</u> 8:00 am – 4:00 pm | Working Group | Willamette University |
| <ul style="list-style-type: none"> • <u>June 4, 2009</u> 8:00 am – 4:00 pm | Working Group | Willamette University |
| <ul style="list-style-type: none"> • <u>August 4, 2009</u> 8:00 am – 4:00 pm | Working Group | Willamette University |

| Action Items | Who | When |
|---|---------------|--------------------|
| 1. <u>Information Follow up</u> <ul style="list-style-type: none"> • Develop and distribute action items, flip chart notes, and meeting summary | Kearns & West | By cob, February 9 |

| Action Items | Who | When |
|--|-------------------------|---------------------|
| 2. <u>Upcoming Meeting Dates</u> | | |
| <ul style="list-style-type: none"> Hold proposed meeting dates (see above) | Working Group | ASAP |
| <ul style="list-style-type: none"> Distribute doodle to schedule sub-group meetings | Project Team | ASAP |
| 3. <u>Near-Term Priorities</u> | | |
| <ul style="list-style-type: none"> Provide any additional feedback to the Project Team | Working Group | By cob, February 10 |
| 4. <u>Credit Summary</u> | | |
| <ul style="list-style-type: none"> Check with Brett and OST efforts | Project Team | As needed |
| 5. <u>Pilot Project</u> | | |
| <ul style="list-style-type: none"> Discuss NRCS Conservation Plan potential sites | Bobby and Russ | As needed |
| 6. <u>Technology</u> | | |
| <ul style="list-style-type: none"> Conduct a demo of the relevant foundational method at the beginning of each currency focus group | Project Team | ASAP |
| <ul style="list-style-type: none"> Distribute TNC Synthesis mapping to group | Cathy with Project Team | Completed |
| 7. <u>Information</u> | | |
| <ul style="list-style-type: none"> Continue to update decision makers and relevant staff regarding the project | Working Group | On going |

| Bin List |
|---|
| <ul style="list-style-type: none"> Consider idea to present on how markets work in Oregon. Project Team will offer briefings to individual Working Group members in advance of upcoming meeting How to incorporate this project into the existing regulatory framework? Remember the registry does not need to contain/restrict benefits |

| Meeting Documents |
|---|
| <p>The following documents were distributed at this meeting:</p> <ul style="list-style-type: none"> Setting a Conceptual Framework – Counting on the Environment Workshop #2 Materials Booklet Criteria for Selecting a Pilot Project <p><i>Copies of these documents can be obtained by contacting Kearns & West</i></p> |

FLIPCHART NOTES

Conservation Actions

- Near-term priorities
 - In Water Quality category – add pesticides and sediments
 - When meeting with NOAA; check about option of moving near-term items in Salmonid Habitat to the Version 1 actions
 - ➔ Seek ways overall to integrate near-term priorities wherever possible
 - For planting native vegetation – “improve domination of native vegetation”
- Group concurrence to move forward with version 1 – add to near term priorities list and integrate as possible

Target Currency

- In Salmonid habitat, development actions – be sure to add specificity for the next level down
- Need to work out challenge in moving from development actions to the currency credit
- How to model, account for and potentially debit from behavioral modifications on the land

Credit Summary

- Consider issues related to “barriers to fish passage” – how, what, why
- Ensure rational basis for weighting factors
- For DSL components, consider whether there is a way to disaggregate the credits
- Think about whether an upstream owner can bank credits, so when barrier is removed or other contextual factors improve, credits could be used
- Consider whether there is a minimal size for habitat restoration – go in the site eligibility section

Assurances

- Assurance/incentive for project maintenance
- What about effectiveness at the system level?
- Importance of defining the baseline
 - Consider also using historic photo analysis
- Because we do not currently have a robust market, build in some risk management/eligibility – “baby step” policies to use while the market is developing
- Something set up to measure monetary amount (appreciation/depreciation)

Sub-Groups

Pilot Project Subgroup

- Delegate decision making to subgroup
- Review options
- Make choices for pilots

| Group | Participants |
|----------------------|---|
| Water Quality | <ul style="list-style-type: none">• Ranei Nomura• Dave Wilkinson• Russ Hatz (or designee)• Yvonne Vallette• Bill Ferber• Charlie Logue |

| | |
|---|---|
| | |
| Prairie | <ul style="list-style-type: none"> • Cathy Macdonald • Russ Hatz (or designee) • Joe Zisa • Bob Deal • Gina LaRocco • Mike Pope • Eric Wold |
| Wetlands | <ul style="list-style-type: none"> • Russ Hatz (or designee) • Bill Abadie • Kirk Jarvie • Yvonne Vallette • Ken Bierly • Cathy Macdonald |
| Salmonid | <ul style="list-style-type: none"> • Russ Hatz(or designee) • Bill Abadie • Ken Bierly • Brett Brownscombe • Bill Warnke • Mike Pope • Marc Liverman • Joe Zisa |
| Pilot Project | <ul style="list-style-type: none"> • Cathy Macdonald • Brett Brownscombe • Joe Zisa • Russ Hatz (or designee) • Yvonne Vallette |
| “Oncall Status” Potential Pilots | <ul style="list-style-type: none"> • Eric Wold • Clean Water Service • Kirk Jarvie • Dianne Taniguchi Dennis |
| Assurances | <ul style="list-style-type: none"> • Project Team • Coordinating Team • Check in with Ken Bierly |

Meeting Summary

I. Welcome, Meeting Objectives, Agenda, and Action Items

Deb Nudelman, of Kearns & West, opened the meeting by welcoming everyone, leading the assembled group through a brief round of introductions and then reviewing the meeting agenda.

Following the first Working Group Meeting (held on November 20th and 21st of 2008) the Project and Coordinating Teams have accomplished a lot. This second Working Group meeting

was structured to get feedback on this work and to elicit guidance on what is planned for the future--so that these teams can continue to move forward.

Meeting Objectives

The primary objectives of this meeting were to seek agreement by all participants on:

- the proposed operating principles;
- the target currencies, conceptual framework for the credit calculation method and the foundational methods from which to build an accounting system;
- who will serve on the focus groups being established to define each target currency; and
- a subgroup to which pilot project selection will be delegated.

II. Updates from Project Team

Request for Qualifications

Since the last meeting the Project Team, in consultation with representatives of the Coordinating Team, distributed a Request for Qualifications (RFQ) for technical consultants to begin work on developing a credit calculating methodology for the Counting on the Environment program. Nine qualified proposals were received in response to the RFQ. Following a review and group discussion by the Coordinating Team, three proposers were selected for interviews. These interviews were conducted by David Primozich, Bobby Cochran, Cathy Macdonald and Bill Warncke. The Parametrix and Paul Adamus team was selected as the most qualified proposer. Other proposers were qualified on an “as needed” basis. Openness and transparency was a fundamental consideration during this important selection process. The Project Team welcomes any questions from Working Group members who wish to discuss the process in more detail.

Technology Roundtable

Mac Martin of the Willamette Partnership gave a brief overview of the Technology Roundtable meeting held on January 13, 2009. The roundtable was designed by the Project Team to engage and solicit input from those companies leading technology development for ecosystem service markets. The team was particularly interested in understanding what existing technology might be available to serve our market needs and areas where additional effort might be needed to fill any gaps. The assembled group of software developers group was enthusiastic about the Counting on the Environment program and collectively suggested that the first thing we should develop is a work-flow chart detailing the crediting and debiting processes--from site selection to the sale of credits. This work-flow chart could then be used to help identify gaps and existing technologies that could be applied to bring about more efficiency and transparency when building a market in the Willamette basin. Mac and the Project Team are working to complete this work-flow chart by the end of the February, at which point it will be discussed at a second technology roundtable and then brought to the Working Group.

Technology Roundtable: Discussion

There was a brief discussion about how the utility of the technology will be tested in the marketplace. Bobby explained that the pilot projects will be used to test the technology. All future questions, comments and advice related to technology development were asked to be directed to Mac Martin.

III. Operating Principles

Deb Nudelman reviewed the Operating Principles originally proposed to the Working Group at their first meeting. She explained revisions made to the document based upon feedback

generated by the Working Group at this meeting. There were no objections to the changes and no requests for additional changes. The Operating Principles were adopted and circulated for signature.

IV. Target Currencies, Foundational Methods and Conceptual Framework

Overview of Activities

Based on feedback from the November meeting, the Project Team revised the method selection criteria to ensure that all methods selected can work at the site level and be integrated easily with each other. Bobby Cochran then explained that the Counting on the Environment program had originally been focused more narrowly on developing a credit calculator. However, based on input from the Working Group and efforts made by the Project Team since the last meeting, it was determined necessary to expand the scope of the project and create a system that addresses contextual value, risk and uncertainty as well. The revised criteria, reflecting this change, were therefore applied to 33 different methods and sorted into a prioritized list.

Target Currencies and Foundational Methods

Five currencies, with their associated tradable unit and the foundational method, are planned for inclusion in Version 1 of the credit calculator being developed for the Counting on the Environment Program. These target currencies are:

| Target Currency | Foundational Method |
|---------------------------------------|--|
| Water Quality- Temperature | Department of Environmental Quality’s Shade-a-lator |
| Wetland habitat | Oregon Rapid Wetlands Assessment Protocol (ORWAP) |
| Salmonid habitat | Parametrix’s “Methods Library” |
| Prairie habitat | A derived Habitat Suitability Index |
| Water Quality- Nitrogen & Phosphorous | USDA Natural Resources Conservation Service’s Agricultural Policy Extender (APEX) or other DEQ-approved method |

The full Crediting and Debiting Ecosystem Services Document with fuller explanations of the currencies and methods discussion can be found at:

<http://countingontheenvironment.pbwiki.com/f/Crediting+and+Debiting+Ecosystem+Services.pdf>

Target Currencies and Foundational Methods: Discussion

There was significant discussion around the particulars of the various currencies selected for use in Version 1 and also questions regarding currencies that were not included. Group members asked for an explanation as to why prairie habitat had been added as category for target currencies. Bobby explained that adding prairie helps build a crediting system that covers a broader spectrum of land types, including upland habitat. Questions also emerged about the absence of water quantity (flow) as a currency. Flow was not included because there is not yet a clear path to show a site-specific benefit of flow augmentation, making it difficult to credit. Oregon Trout and the National Fish and Wildlife Foundation are considering the development of protocols for a flow currency. There is, however, a very complicated legal structure that needs to be worked out first. Questions also emerged about the absence of carbon as a currency. A carbon currency was not included because there are many other groups working on that currency,

including the Western Climate Initiative, and the Project Team felt that any work done along these lines would be redundant. Furthermore, it is currently unclear who the regulatory authority for the carbon market will be, making approval of a method very difficult.

There was considerable discussion regarding how to account for side channel habitat in the salmonid currency, providing assurance against conflicting ecological goals, and the importance of considering flow. In particular, there was strong interest in continuing discussions on quantifying the ecological benefits of side-channel restoration. Ken Bierly mentioned that Stan Gregory and David Hulse are currently doing a lot of research that could be helpful to this discussion.

After considerable discussion the group agreed that Version 1, as presented, was an acceptable baseline for moving forward. Additional recommendations for near-term priorities are to be submitted no later than February 10, 2009. A summary of additional currencies and the rationale for not addressing them in Version 1 can be found on the Counting on the Environment wiki: <http://countingontheenvironment.pbwiki.com>.

Target Currency Credit Actions and Development Actions

The credit calculation methodology considers a small set of predefined conservation and development actions that are appropriate for every currency. Conservation actions are the creditable activities taken by land managers to improve ecological functions on a site. Development actions are the debit activities that negatively impact the ecological functions of a site. The selected sets of these actions can be viewed in the Crediting and Debiting Ecosystem Services Document available on the Wiki site. Due to constraints on time and budget, Version 1 will only be applicable to these narrow sets of conservation/development actions (data will be collected that could turn other actions into credits or debits in the future, but a subset had to be selected for Version 1). The number of approved restoration and development actions, just like the number of approved currencies, may be expanded in future versions of the credit calculation methodology.

Target Currency Credit Actions and Development Actions: Discussion

The Working Group thought it was important to be specific in the development of debited actions and not be too generic. Impacts were articulated to be difficult to measure. For example, a small impact in size, such as blocking a side channel, can affect miles of habitat. Similarly, a house on a large rural property may have a small footprint, but the impact to species can be felt for miles around. One house can have multiple direct biological impacts due to lawn treatments, a septic system, fencing or even motor-cross tracks. If you have two properties of 20 acres one with a house and one without, it makes a big difference. Impacts don't just happen with development they happen over time. When building the methodology such realistic scenarios need to be considered.

Credit Calculation Methodology's Conceptual Framework

Bobby Cochran presented the framework for an integrated ecosystems credit calculation method that will function much like a methods tool box. The methods will use the following approach (indicators; measures; site conditions; overall values; ecosystem credit/debit):

- 1st step, interview land manager
- 2nd step, collect spatial data
- 3rd step, draw map units (divide site into sub units of common habitat structure, and distinctive vegetation)

- 4th step, assemble data sheets then (field work to identify indicators)
- 5th step, confirm map units (e.g. check for things like fish barriers, or if you need to split a riparian area into 2 different units)
- 6th step, collect baseline data by unit.
- 7th step, project post action data by unit and estimate credits.
- 8th step, Assessing impacts in the field (e.g. adding homes or a bridge then calculating the debits) At this point you go back to the office and enter the data into data fields to get the overall scores

Bobby went on to explain that GIS would likely be a critical component of the framework and that the group and Project Team will have to consider the relative benefits of web enabled GIS and desk top GIS. Additionally, there will have to be consideration of whether and how using GIS will limit the availability to everyone. The group discussed that the method may not have to be easily used by the public and would more likely be used by land managers who are familiar with working in GIS. Currently the ORWAP methodology does not use GIS and Parametrix Methods Library does.

Bobby also explained that the Project Team had initial concerns about the number of data sheets required with this approach. However, through initial work by Clean Water Services field staff it was determined that filling out data sheets for each map unit was in fact a more efficient manner of collecting data.

Credit Calculation Methodology's Conceptual Framework: Discussion

There was discussion about the lack of available data on existing barriers to fish passage on private lands. It was noted that ODFW, Forest Service, and other federal and state agencies may have data on some sites, especially on federal lands.

The group also had considerable discussion on how the methodology will account for impacts associated with adjacent lands. The Project Team explained there are questions in the methodology about the width of buffer around the stream but right now the methods are not sensitive enough to test for that. Adjacent fields are treated like an adjacent property.

The group raised a question about how crediting would occur (if and who would receive credits) if restoration is done upstream from a fish passage barrier. It was agreed that further discussion of this topic and others like it would be necessary as the project moved forward. It was suggested that Oregon Trout and the Defender's Conservation Registry may be able to assist in assessing areas of high priority, as well as weighing the value of certain actions.

The group discussed weighting actions so as not to create "perverse incentives" or actions that do not meet the ecological goals. Some group members saw opportunities to incentivize to create high priority restoration actions. For example, considering a minimum size for an area for restoration and site eligibility. The group agreed that assurances would be a crucial component of the methodologies success.

Assurances

The Project Team described the assurances categories that would need to be addressed, when creating a market for ecosystem services, to maximize credibility and ensure legitimacy. These categories are:

1. Eligibility (minimum requirement for participation in trading)

2. Verification (on-site verification by qualified personnel)
3. Risk management (uncertainty, bad behavior, temporal loss, etc.)
4. Context
5. Performance Standards
6. Monitor (are you getting the ecological benefits desired)

Assurances Discussion

There was continued discussion about how to design assurances that balance the desire for specificity with the need to move forward. Group members agreed assurances need to both protect buyers, sellers, and environmental outcomes. Such a system needs to ensure we don't create incentives to degrade the environment because people can expect to get credits later. It was suggested that aerial photography may be one way to help address this concern.

The group also discussed the importance of a registry in the context of providing assurances to ensure project performance and avoid "double dipping" in the credit market. The group also discussed the need to have oversight of the registry and identified the need to establish who would have this oversight responsibility.

Group members suggested it will be important to develop standards and a risk management system to address the fact that a robust market does not presently exist. Similarly, it was suggested that you might be able to develop a user guide that motivates bankers to find the best sites that are most beneficial. It was also suggested that it may be necessary to set up a monitoring system that measures the appreciation and depreciation of a site over time. For example, verification processes through which sites are monitored on a yearly basis and if there is a problem at the site it will be considered a breach of contract.

There was considerable discussion about who would bear the responsibility of depreciation. It will be necessary to balance the fact that buyers want security but also consider the long term environmental benefits of actions.

The Project Team expressed their appreciation for the group's input and suggested that subgroups get into the details to ensure that the right indicators are tied to the right functions. The subgroups will meet in February and late April/early May.

There will be two full rounds of field tests on pilot projects. The vision for March is that Parametrix & Paul Adamus will be the user group and in May there will be a regular user group. We need to be able to test a baseline and projected action to see if we are hitting our mark in both March and April.

Focus Group Selection

The Project Team explained that to efficiently gather information necessary they are recommending that subgroups work on each of the currencies in Version 1. Participation in these groups is open to anyone who has an interest and it was strongly suggested that the agencies responsible for each currency participate in the subgroup relevant to the currency. Project Team representatives will also participate in each team. The Willamette Partnership will coordinate each subgroup meeting, take the notes and conduct follow-up. The Focus Group participants are listed in the Action Items section of this document.

The Project and Coordinating Teams, along with Ken Bierly of the Oregon Watershed Enhancement Board, will compose an additional sub-group that will discuss and propose a set of assurances for Version 1 and present them to the Working Group in April for feedback and approval.

V. Pilot Projects

Introduction

David Primozich provided the group with the following rationale for using pilot projects:

- To test our ability to say yes and the agencies have the opportunity to say yes or no.
- To test the validity of the method, to see where the no is and to have the ability to reshape or redirect actions.

David went on to describe the effort to date in trying to identify a suitable pilot project. He explained that at this point there are 7 potential pilot projects. David has talked to the representatives on almost all of them. There was a brief discussion of some additional potential sites from NRCS, Oregon Trout, TNC, and others. The Project Team then asked the group to delegate a subgroup to work on behalf of the Working Group to select a pilot project. Volunteers (identified below) offered to help with this effort and the group agreed that the subgroup would continue the work of selecting a pilot site. If Working Group members have potential sites they think should be considered, they were requested to contact the Project Team as soon as possible. A hand out was circulated with the criteria for selecting a pilot project.

Draft Criteria for Selection of Pilot Projects

1. Site location.

- The site is within one of the Synthesis priorities. The Nature Conservancy has a map that will overlay anywhere in the Willamette which is really helpful. An email can be sent out for anyone who would like to view it.
- The site has characteristics to support multiple ecosystem benefits. It clearly needs to have the ability to generate the types of credits we are interested in.
- The site is large enough to support multiple zones of credit creation. We need to be able to create polygons around the homogenous vegetation/habitat types.
- There is a mix of pilots in urban and rural areas. This is possibly the most challenging.

2. Project Support.

- The lead or land owner is willing to work with us to test methods. We have been spending a lot of time on finding people who are able and willing.
- The project has the financing in hand to complete the project. We want this to go all the way through to the banking process and that takes time and money.
- There is some level of regulatory agency support for the project already. We want to avoid finding a project the agencies don't like.
- The lead is willing to share information collected as part of this project. We want the project sponsor to be open so we can use this as a training ground.

3. Site characteristics and timelines

- It is important the site has some design already so that we can get a baseline & projection.
- The minimum requirement for March is that we need to be able to collect baseline data. The challenges of the subgroup/focus group are to decide on what criteria in what detail.

The potential is there and we can network and work with the subgroup/focus group to find the right project.

Pilot Project Focus Group

A pilot project team was selected and they were delegated the authority to make decisions on the pilot projects to be selected for evaluation by the credit calculation methodology. The list of Members is included in the Action Items section of this document:

VI. Planning for upcoming meeting

The group was reminded that the next Technology Roundtable will be held in March and a follow up presentation to the Working Group in April.

Willamette Partnership will be making sure that the appropriate policy people are contacted between now and April and also encouraged Working Group participants to continue to communicate with relevant staff at their organizations and agencies.

VII. Summary and Acknowledgments

The Working Group members were thanked for their participation and the meeting adjourned.



**INCREASING THE PACE, EXPANDING THE SCOPE, AND
IMPROVING THE EFFECTIVENESS OF CONSERVATION**

Date: February 20, 2009 3 – 5 p.m.

Topic: Counting on the Environment Water Quality Focus Group Meeting

Location: Clean Water Services Durham facility 16580 SW 85th Avenue, Tigard, OR 97224

Attendees: Ranei Nomura, Dave Wilkinson, Denise (NRCS) Russ Hatz, Yvonne Vallette, Bill Ferber, Charlie Logue, Ali Saleh, Alan Henning, Bobby Cochran, David Primozich, Joni Shaffer

Agenda Attached ___ Yes No

Water Quality Focus Group Meeting

The Counting on the Environment Project is funded by a Conservation Innovation Grant through the Natural Resources Conservation Service. Its purpose is to develop an integrated ecosystem crediting methodology that land managers can use to put good conservation actions on the ground. The focus of the project will be on wetlands, salmonids, water quality temperature, prairie and possibly water quality nutrients. This methodology may be expanded to include other conservation actions in version 2. The current area of focus is in the Willamette valley but we would like be able to expand this to a larger geographic area.

On February 3rd this project held a meeting of federal, state and local government, environmental leaders along with the interested public called “the Working Group” and they have approved the version 1 methodologies for the ecosystem credit calculator. We plan to use the Shadelator to measure temperature, ORWAP to assess wetlands, the Nutrient Trading Tool for water quality nutrients and sediments, and we are starting from scratch on a prairie methodology.

After today’s meeting we will be heading out into the field for testing in March. The results of the field testing will be taken back to the Working Group in April and then a final field test in May. May’s field testing results will be taken back to the Working Group in June for any needed tweaking. Then we will be looking for approval in August.

The reason for the radical timeline is the time constraints of the NRCS grant. We don’t see another funding source that will pay for this. We have had a lot of support from Clean Water Services and want to recognize the great work from DEQ and the Water Quality Trading Team.

Methodology

We are farthest along on this methodology. For temperature we are going to use the Shadelator as the way to measure credits for riparian shade. On the Willamette Partnership’s website there is a Temperature Trading Handbook which represents the bulk of work done under an EPA grant

to show a land manager a way to calculate credits for temperature by riparian restoration. Today we want to talk about the multiple benefits of restoring a riparian area that the land manager may have.

The Nutrient Trading Tool

We had a meeting last week with DEQ who said that nutrients are not a priority problem in the Willamette Valley. They believe that at a larger scale temperature is the bigger issue. In smaller watersheds nutrients are a problem. Clean Water Services does have a nutrient TMDL for phosphorous on the Tualatin river. We need to decide how much effort and time it will take to get the Nutrient Trading Tool up and working on the Tualatin and is if it within the scope of this project.

The Nutrient Trading Tool is currently being used across the country. The way it works is to create a series of management actions at the edge of field. The Nutrient tool also calculates sediments and is adding pesticides and carbon in the future.

NRCS has the data to populate the Apex model. Most of the database has not been automated by GIS but the data is available on the Russell II database including pesticide data, management programs, soils and geometrics of field, all of this information comes into the Apex. Shawn at NRCS says it wouldn't take long to train someone or he could do it himself. DEQ was positive about using the Nutrient Trading Tool outputs.

To get started using this tool in your area, you can use a small city or valley for a testing model in your area to calibrate for the watershed. You will also want to be calibrated for flow and modified for sediments. Currently the coast range has sediment problems, McMinnville & Yamhill will have sediment load allocations soon.

Future Currencies

David is currently working on flow augmentation. He is checking to see if water rights can be used to generate credits by putting water back in the stream.

There have been a lot of questions why we are not doing flood plain restoration. This is something that we may do in the future. NRCS received funding for flood plain restoration and we may circle back and check if this can be a benefit for temperature, salmon or stream. At DEQ they have started evaluating flood plain restoration. When Sonya and Ryan put that together they will come and talk to you.

We have also been asked why we are not doing carbon. There is so much going on with carbon that we are watching to see what comes out of it. In addition, the land based indicators are so different that what we are currently doing.

Action Items

- Willamette Partnership and Ali Saleh schedule a meeting with Shawn at NRCS to see what it would take to get the Apex populated for Washington County

The Water Quality Group was thanked for their participation. We will be asking the group to come together again in late April. There will be another set of field testing in May and we are looking for approval in August.

Date: February 20, 2009 from 1 – 3 p.m.

Topic: Counting on the Environment – Wetlands Focus Group

Location: Clean Water Services Durham Facility 16580 SW 85th Ave., Tigard, OR 971224

Attendees: Bill Abadie, Yvonne Vallette, Bobby Cochran, Dana Hicks, Kirk Jarvie, Dana Field, John Christy, Paul Adamaus, Ron Raney, Russ Hatz, John Marshall, Patty Snow, Jay Lorenz, David Primozich, Joni Shaffer

Agenda Attached Yes No

Wetlands Focus Group Meeting

Introduction

The Counting on the Environment Project is a project funded by a Conservation Innovation Grant through the Natural Resources Conservation Service. Its purpose is to develop an integrated ecosystem crediting methodology that land managers can use to put good conservation actions on the ground.

On February 3rd this project held a meeting of federal, state and local government, environmental leaders along with the interested public called “the Working Group” and they have approved the version 1 methodologies for the ecosystem credit calculator. The focus of the methodology will be wetlands, salmonids, water quality temperature, prairie and possibly water quality nutrients. We plan to use the Shadelator to measure temperature, ORWAP to assess wetlands, the Nutrient Tool for water quality nutrients and we are starting from scratch on a prairie methodology.

After today’s meeting we will be heading out into the field for testing in March. The results of the field testing will be taken back to the Working Group in April and then a final field test in May. May’s field testing results will be taken back to the Working Group in June for any needed tweaking. Then we will be looking for approval in August. The reason for the radical timeline is the time constraints of the NRCS grant.

Wetlands Methodology

Oregon Rapid Wetlands Assessment Protocol (ORWAP)

ORWAP gives 16 functional scores based on the number of acres and the value of their function in context. The agencies have been working on how to take these numbers and translate them into a decision for permits, restoration and mitigation banks. This past summer Paul Adamus tested 220 sites around Oregon. The purpose was to iron out any awkwardness, answer questions, pin down data that was not practical and add any suggested indicators. DSL also contracted six independent consultants to test it and did a volunteer study to look at repeatability in the scoring. ORWAP will be complete and available to the public April 1st.

The Counting on the Environment Project is looking at using ORWAP to assess wetlands and wet prairie. Paul is working on using this functional based assessment to create a crediting tool.

These 16 scores for function can be collapsed down into five, which will be the crediting tool. We are also working with the USACE & DSL to help us determine what this will look like.

The Counting on the Environment project plans to have ORWAP as part of a toolbox that a land manager can use to test a site for restoration opportunities and decide how to sell the credits in a market as wetland, salmonid, water quality or prairie.

Distinguishing how to count credits on a site

Discussion commenced on the conceivability of stacking multiple types of credits on the same geography (e.g. stream and wetland credits for a forested wetland along a stream bank). It will be possible to delineate different areas into polygons on a site and sell those separate polygons into separate markets. Once you decide which market to sell the credits into, that polygon will only be able to sell that one type of credit. We are not asking the agencies to approve multiple credits for actions in one polygon.

Functional replacement

Discussion continued regarding acreage replacement. There will not be a complete shift from acreage replacement to functional replacement. What ORWAP is hoping to change is to figure out what the function replacement will be and how to achieve that. Enhancement actions are losing acre functionality and never catching up. The reason for mitigation project failure is largely bad site locations. If you have a bad habitat for amphibians, adding more bad habitat doesn't help. Now that the ORWAP includes measures of ecosystem value, it will help steer restoration and mitigation in the right area. ORWAP may become a tool that would make ratios irrelevant and replace with a quantitative outcome.

Questions and concerns for how these changes will affect restoration were raised. What will be the assurance for moving away from ratios? If you just do 1 – 1 replacement, at the end of the day how will you account for lost acreage and the value of the acreage lost? How do you value what will exist in the future for what you are losing today? It was suggested to have a designation of high medium and low quality restoration and only do medium and high.

Discussion continued on what are the functions and values of “in kind” and “out of kind” restoration. Current definitions are based on wetland habitat type. Moving to functions-based trading may alter what “in-kind” means. For example, can you replace water quality functions lost on an emergent marsh with those gained on a forested wetland? If a mitigation site provides almost all functions from an impact site, except for the fish habitat functions, does it matter what type of wetland those fish functions come from? The project team agreed to bring some suggestions back to the group.

DSL currently has a limited number of traditional mitigation recipes. These could be weighted and decided which ones are best and require that those ones be done. Logic statements along with a functionally weighted value of acres is a more refined tool and can address wetland activity which will address assessment problems. For example, blocking drain tile on one site can create an uplift and blocking it in another would not create any uplift.

It is important that there are a set of rules that bankers understand. They will want to know how much money they need to invest, what is the cost to restore functional value and how many credits that translates into. Indicate what the incentives are to using a higher grade of restoration that will show functions going up over time and more credits which can be released. Having the

contextual value of the landscape will give the bankers the opportunity to pick locations that are of high value

Temporal Loss, Risk and Assurances

Temporal loss was discussed and how to account for this. This may be more of a policy issue. We know what has a high risk of failure and what works well. Ratios and more acreage replacement than what has been lost are an argument for temporal loss. You can use risk & timelines as multipliers when calculating the ratios for the risk factors. Site management can also address temporal loss. DSL is still requiring a monitoring assessment at 5 years that proves you are getting what you want. Would DSL have the ability to add in risk assurance?

The group asked about how to deal with temporal loss of habitat needs to be accounted for. If you impact a forested wetland you should have to replace a forest wetland. Another tradeoff might be that if you affect a wet prairie site then you must replace wet prairie or something even better. The question of how to determine the quality and what are the best restoration sites were discussed. Some suggestions of valuing based on species, regional rarity, special areas of cover, recovering vanishing habitats, natural heritage sites can all be given priorities. Kirk Jarvie wanted to make clear that DSL cannot force mitigation that is above the functional replacement of what is being lost.

The group leaned away from accounting for temporal loss, but the project team will bring back some scenarios for assurances that may include some accounting for temporal loss.

Developing Smart Credits

The group focused on creating “smart credits”. With a smart credit system, bankers could develop a diversity of credits and the regulating community could mitigate in different areas. There would also be the ability for a landowner to sell credits in multiple markets. First we need to get agreement on how to calculate this. The group will need to think about how to combine functions and values to get at services. We need a process that is predictable not simple. The challenge will be creating uplift that is predictable and consistent.

Paul Adamus and the project team will develop several scenarios based on the group’s discussion on how to translate ORWAP scores into units that can be traded in a regulatory context. The project team will wrestle with combined functional scores vs. separate ones, the definitions of in-kind vs. out-of-kind, accounting at the permit level vs. program level, and some of the economic implications of the different scenarios.

The Wetlands Focus Group was thanked for their participation in this meeting. We will ask this group to come together again in late April after the first set of field testing is completed and those results taken back to the April meeting with the Working Group.

Date: February 23, 2009 1 – 3 p.m.

Topic: Counting on the Environment Salmonid Focus Group

Location: Clean Water Services Durham Facility 16580 SW 85th Ave.nue, Tigard, Oregon 97224

Attendees: Bobby Cochran, David Primozich, Deborah Vigoravid, Bill Abadie, Ken Bierly, Brett Brownscomb, Bill Warncke, Doug Baus, Kelly Moore, Brandt (parametrix), Jim Turner, Marc Liverman, Damon Hess, Joni Shaffer

Agenda Attached Yes No

Salmonid Focus Group Meeting

Introduction

The Willamette Partnership is a non-profit organization dedicated to increasing the pace, scope and effectiveness of restoration. The Counting on the Environment Project is a project funded by a Conservation Innovation Grant through the Natural Resources Conservation Service. Its purpose is to develop an integrated ecosystem crediting methodology that land managers can use to put good conservation actions on the ground. This project is based on the ground work done under an EPA grant for trading water temperature credits.

We are focusing on developing a methodology for wetlands, salmonids, prairie, water quality temperature and possibly water quality nutrients. We are working with 25 federal, state, local government agencies and conservation leaders called “The Working Group”. We are looking for approval of this methodology August of 2009 starting in the Willamette Valley and hoping to expand geographically. On Friday, February 20 we met with three other focus groups’ for prairie, wetlands and pilot projects and made great progress. This group’s focus is salmonids. In March we plan on taking this methodology out into the field and bringing the results back to the Working Group in April, then a final field test in May and wrapping up in August.

Background

Bill Warncke with ODOT began working on a methodology for mitigating for salmon in 2005. It was a multi agency effort. They met weekly from July 2005 through May 2006 and spent a lot of time deciding what the salmon need. In March of 2006 expert panels met and provided feedback on their work and the methodology was adjusted. Pilot studies were done in June 2006. At this time ODOT’s focus shifted back to doing mitigation as they had done traditionally. Parametrix, who was also working on this project, decided to continue the work. Parametrix made a decision to invest additional time and human power into this project and completed the methodology for an ecosystem measurement tool.

To use this tool you initially do a survey and collect indicators, the indicators drive functions and determine a baseline. Last you project post development action and reward either a credit or debit. Oregon Trout used this methodology with streambank on four separate sites to get a feel if the results made sense. One alteration was made changing from weighted acre to weighted linear foot as the tradable unit. This made more sense for quality purposes.

What we need to address in the next 90 minutes is a model that will provide consistency and predictability and also be used by regulators. We need to hit benchmarks that the agencies agree on.

Discussion commenced on who the customers will be that we are building this tool for. The customers will be the people who make impacts that can't be avoided. They will need to mitigate for those impacts. We want to make sure that mitigation happens in the right places where it will make a difference. We have multiple currencies we are looking at and we want to create a methodology with an ecological perspective.

Not all sites are counted as equals. If there are no salmon, then there are no salmon credits. This can be addressed in site selection criteria. The market infrastructure will have a credit registry. If someone sells a credit that credit will have a serial number and be tracked over time. These will be monitored so that they will not be sold more than once. There will be standards that the regulating community agrees to and third parties checking that the rules are applied. The basics of a project have to meet a set of standards and the methodology is to decide what those standards are.

Selection Criteria

Discussion centered on site selection criteria. We need to develop the screening criteria to be able to distinguish a comprehensive approach. Some site criteria could be: can salmon get to it, stream bank side strength and bank improvement, watershed scale-is it in the right place. All these criteria should be site specific. The sites need to tie into a recovery plan. NOAA has data priority records & population structure. We need a system to designate priorities and designate what is high, medium low.

One thing ODOT did was develop conceptual guidance for the limiting factors in the watershed. Some limiting factors are overall viability of the population, conductivity and disease. One concern is that everyone does not speak the same language and don't define limiting factors in the same way which may make them hard determine. When determining limiting factors consider location, scarcity and function on site then assign weighting factors to discount overall liability & risk.

Just because we don't have a recovery plan doesn't mean we don't have enough information to move forward. The Oregon Coast Team has done a lot of work already and can help quantify the analysis. There is comprehensive information for the Willamette Valley that can be used for units of exchange.

Indicators can be weighted (e.g. large wood) and multiple functions. For a full list of indicators please refer to the Parametrix hand out. You should receive a higher weighting if your performance is happening in a priority area. We need to have agreement on where to go for information about contextual issues that prioritize the weighting factors. The criteria for streams are complex and can be confusing. Some resources are fish history, GIS mapping and Watershed Councils. When comparing rivers like the Mollalla to the North Santiam you will need exchange rates.

This is not a static tool and new information will continually be added in. We need a mechanism to track progress and a way of tweaking it with new information. We want it to grow with the balance of level of information with ability to act. It is difficult to say when you have enough

information to move forward and know that you aren't doing the wrong thing. We have draft recovery plans, the information is never perfect. We need to know where the gaps are so that we can move forward.

It will be important to capture the bigger picture. Identify the recovery plan working up from the details. For restoration you will need to restore 60 – 70% to get real results. In context and communication with the regulatory agencies you don't want to get into too many details. Try to capture the larger picture and what will contribute to it. The details can be used for the land owner for restoration guidelines.

Under no circumstances can markets acting alone achieve recovery. We know impacts are happening and will continue to happen. What we need is to put mitigation in places where it will make a difference. We can set a standard approach with the methodology that can contribute to recovery. This is an opportunity to identify areas and focus activities.

To determine baseline, limiting factors, and viability for populations it would be good to work through some examples. It is hard to have an idea what a multiplier would be without examples. One way to approach developing a conceptual model would be to write up how you believe the natural process works and explain how the system functions. Take examples of different rivers with the information available and narrow the scope before this group comes back again. Pilot projects are set up at Gales Creek, several sites with Streambank and Delta Ponds.

What Damon needs are sources for contextual value to check information to look at build up and run it through pilot projects to play out weighting values. Look at ways of prioritizing habitat restoration based on a conceptual plan identify population, limiting factors, threats, management and that may lead you to context. The number one priority for limiting factors is culvert removal. Others include stream temperature, location, context of upstream and downstream, water resources, sediment and global climate change. Use the best information we have and when we get better information we can update it.

You can use EDT and professionals with a personal level of knowledge to capture the context on the ground. This could become part of the initial screening. They could have a three hour brainstorming session looking over the maps for a particular area and checking it off that it makes sense.

The salmonid group was thanked for attending the meeting. We will digest the comments over the next weeks and go out into the field in March and bring the full draft methodology to the Working Group on April 17th. If you would like to comment further and keep up to date on the project please visit the Counting on the Environment wiki page <http://countingontheenvironment.pbwiki.com>

Date: February 20, 2009 from 9 – 11 a.m.

Topic: Counting on the Environment - Prairie Focus Group Meeting

Location: Clean Water Services Durham Facility – 16580 SW 85th Ave., Tigard, OR 97224

Attendees: Cathy Macdonald, Kathy Pendergrass, Gina LaRocco, Eric Wold, Paul Adamus, Ed Alverson, David Primozich, Anne Marie Myers, Bobby Cochran, Jimmy Kagan, Joni Shaffer

Agenda Attached ___ Yes X No

Handouts: Credit Calculator for Willamette Prairie Habitat Services

Counting on the Environment Prairie Focus Group Meeting

Introduction

The Counting on the Environment Project is funded by a Conservation Innovation Grant through the Natural Resources Conservation Service. Its purpose is to develop an integrated ecosystem crediting methodology that land managers can use to put good conservation actions on the ground. The focus of the project will be on wetlands, salmonids, water quality temperature, prairie and possibly water quality nutrients. This methodology may be expanded to include other conservation actions in version 2. The current area of focus is in the Willamette valley but we would like be able to expand this to a larger geographic area.

Prairie Calculator Methodology

This Group's focus is on prairie. We are in the unique position to create a methodology and say what a prairie credit would look like and to develop the technology to say how it is counted.

Group Discussion

Discussion first centered on who the buyers would be in a market? While there are not any current buyers outside of the voluntary markets, the impacts to prairie will become more regulated over time. There are federally listed endangered species like the Fender's Blue Butterfly that will need to be mitigated for. Very few people are currently mitigating for this because there is not a system in place for distinguishing credits.

The concern was raised of how to divide wet prairie from upland prairie & wetlands. It may be simpler to let uplands be uplands and wetlands be wetlands and focus the prairie methodology on upland prairie. Some ways to differentiate between upland and wet prairie on the sites would be to identify natural habitat, species, soil type and wetland cover. Another way to work through the differences would be in how the sites benefits would be rolled up into a credit.

To avoid any double dipping, it will be important that when you draw your landscape polygons that you do a wetland delineation and an upland prairie delineation and decide which market to sell in. If you are using ORWAP (Oregon Rapid Wetlands Assessment Protocol) to score the wetlands you can also use it for wet prairie but not upland prairie because it is not currently sensitive enough to provide an accurate score for both.

Credit Calculator for Willamette Prairie Habitat Services Handout

In-Office Determinations: It was discussed that the screening criteria of having greater than 95% of the areal cover of herbaceous vegetation is too high. It may be better to assess the restorability of the site and that the 95% criteria would exclude some sites that would be beneficial to restore. Paul Adamus will revisit this and make a determination of an appropriate percentage of areal cover.

Scoring Rare Plant & Insect Species: It was determined the listed rare plant & insect species be limited to Fender's Blue Butterfly, Taylor's Checkerspot, Kincaid's Lupine & Willamette daisy. The focus should be on the butterfly since version 1 of the calculator will be focused on regulatory driven species. Nectar sources, distance to other restored prairie, and barriers to that prairie should be indicators for ratios and field weighting when calculating prairie credits. There is potential to integrate State listed species and rare species to the methodology in a later version of the calculator.

Scoring for Rare Wildlife Species: When scoring for rare wildlife species, the site will be delineated into polygons of homogenous vegetation units. It will be important to visit prairie sights in the same month of the year otherwise there could be a different score applied to a site each time you went out. In discussing how to keep the site assessments consistent, it was determined that data collection eligibility be limited to mid May through early July. This is the best way to keep standardization, integrity and credibility in the scoring.

In Field Determinations: It is important to protect the good sites and have a bias toward larger tracts. There should be a way to rate sites as high, medium and low. It was also discussed to provide a way to credit sites for both invasive species not being on the site and for keeping them away. One way to apply this would be to add an indicator for percentage of cover of native perennial grasses. Discussion continued on how to not discourage medium quality restoration actions and at the same time not promote bad quality sites. If the site has great potential you don't want to discourage someone from putting money into restoration. To account for debits on a site, homogenous polygons would be drawn over bare areas of heavy grazing, ATV tracks, weedier invasive species, and major ground disturbance. The group will consider how to score this.

When assessing the sites it is important that a trained professional conduct the assessment so as to identify plant species. At the same time this assessment also needs to be a rapid assessment. When assessing a site of a few acres compared to 100 acres it would take substantially more time to individually assess all vegetation. The group decided that a visual assessment would be acceptable. If a person has the capability to do a more thorough assessment they could do so and possibly get rewarded with a ratio for more clear data.

The TNC synthesis map can be a useful tool to identify the distance to other prairie sites. Distance to lupine is also an important indicator. Andy Robinson worked to develop a basic detailed model of places that we know where lupine is and also the right soils for it. You can use that information to help identify lupine on public lands but it is problematic for finding it on private lands.

It was decided that the Project Team would put off full site assessments until May and do some modeling of the methodology on different sites with aerial photographs. The Prairie Focus Group will be given examples of scoring on these sites so that they can better determine scores

and uplift at the next meeting. The next Prairie Group Focus meeting will be at the end of April after the next Working Group meeting.

Action items

- Draft of recovery almost done, Jimmy Kagan says people can see it and he will send it out
- Ed Alverson will get the list to Jimmy Kagan of the current upland prairies
- The prairie full site assessments will be put off until May, aerial photo assessments of different sites will be done and the scoring brought back to the Prairie Focus Group in April so they can have examples and better determine baseline and uplift.
- Willow Creek, Basket Slough, Colberg & Kingston Prairie were suggested as potential sites

The Project Team thanked the Prairie Focus group for their time and help with development of this methodology. If there are any questions you may contact David Primozich, Bobby Cochran, Paul Adamus & Damon Hess. Also, you can check the Counting on the Environment wiki site for discussion and updates. <http://countingontheenvironment.pbwiki.com/>

Date: February 20, 2009 from 11:30 a.m. – 12:30 p.m.

Topic: Counting on the Environment Pilot Project Focus Group

Location: Telephone conference

Attendees: Eric Wold, Damon Hess, Bobby Cochran, David Primozich, Paul Adamus, Cathy Macdonald, Brett Brownscombe,

Agenda Attached ___ Yes X No

Counting on the Environment Pilot Project

Introduction

In the meeting today we will talk about the potential pilot projects for testing the methodology and credit calculation for the Counting on the Environment Project. We have narrowed the scope of suggested sites down to a few really good ones to choose from.

Delta Ponds

Discussion of the pros for this site were that it was good for testing salmon, it has good historic data, there is money to execute the restoration and it is in the UGB. MWMC is likely to buy the temperature credits from the site. This site may offer them the opportunity to meet that obligation. There is potential for temperature credits in the north portion of this site. The north portion is currently in Lane County ownership but the city has rights to do projects and Eric will check on the lease in regards to banking.

He described the site as a 150 acre site including side channel restoration. Paul Adamus stated that he has already done an ORWAP assessment on some of the ponds. If Delta Ponds is determined to be the best project for Salmon then we will evaluate Salmon there, if Brett's project is better for salmon then we will assess water quality for temperature at this site. David, Eric & Bobby will assess which units to prioritize collection on so that we don't lock up 150 acres for water quality.

Action items

- David, Eric & Bobby will assess which units are most important to prioritize on
- Eric will indicate on a map of the project which areas can be used for field testing and check on the lease with Lane County
- Eric will keep David in the loop in conversations with Peter Ruffier regarding temperature credits

Prairie sites

Willow Creek: Cathy Macdonald indicated that there has been a lot of well documented restoration work done in recent years on this site including restoring wet prairie and upland prairie. Because of this work there is the ability to do a retrospective on this site. They have a preliminary design from OWEB to restore part of a channel which would give a riparian restoration on a prairie area. There is a great population of Fender's Blue Butterflies. The drawbacks are when it comes to selling credits on this site you will have to be careful about double dipping and it is difficult to separate the wet prairie from the dry prairie.

Coberg Hill: This site also has a Fender's Blue Butterfly population along with acquisition dollars and no O & M money. U.S. Fish has a private stewardship landowner incentive. There was discussion regarding U.S. Fish putting money for testing the methodology and then using this site to point to for how to get credits from and then retire them. There was debate over if this is worth the expense.

Yamhill: Cathy Macdonald recommended using the Yamhill site for testing. There is more potential on this site and it is earlier in the restoration process. It is a farm field that is currently being restored. They have done some planting of nectar and lupine. One project is done and well documented. It has the habitat basics and there are 3 stages of prairie at work on this site. There is a potential for wet prairie restoration there as well as carbon credit trade for conifer in the future. Paul Adamus agreed that you can get all that you need from prairie at the Yamhill site.

It was determined that we currently do not have a perfect pilot project scenario for prairie which would be one private owner, a private funder and a regulatory agency that will acknowledge credits. Since we don't need to do a field test until May there is the flexibility holding off on making a final decision until May. Right now the #1 choice based on the recommendation from Cathy is the Yamhill site. If time permits, it was decided that the field testing group will go to the Willow Creek site on March 3rd.

Oregon Trout

Brett Brownscombe stated that the Section 319 money has been approved to test the Streambank Tool and there are multiple sites available in the Willamette Basin. Brett's idea is that DEQ is a good way to connect projects with people needing to satisfy temperature mitigation. Brett has talked to Pete & Joe to develop a strategy on how to use this tool to calculate credits. This would be a good opportunity to take the methodology all the way from calculating credits to third party verification and then registering them. They will be ready to test on willing landowners and have a baseline done by the end of March. It was discussed that the ideal project to test for salmon would be a lower elevation cascade tributary for spawning and rearing.

It was decided that a project in the Mackenzie River area would be best. Cathy Macdonald had a project submitted to the TNC from Joe in that area and will forward that to Brett so that he can follow up. Brett will follow up early next week. They have committed to DEQ for 4 projects on Sec 319 TMDL. David said that the Willamette Partnership will register each one and make all of them a pilot project.

Action Items

- Brett Brownscombe will have a baseline done by the end of March
- Cathy Macdonald will forward a project in the Mackenzie River submitted by Joe to the TNC
- Brett will follow up with Joe early next week on a Mackenzie River project

Gales Creek

The Gales Creek site is farmland along a ½ mile stream section of Gales Creek which runs into the Tualatin River. There is also 20 acres of wetland restoration available on site. DSL is paying

for the wetland restoration and Clean Water Services is paying for the riparian planting for temperature and has the pre-design done.

Action Items

- It was decided to include the Gales Creek site as a pilot project.

City of Portland

David talked to Mike Reed of City of Portland for Tri End Creek. It was decided that we have enough projects related to salmon right now. There was no objection to waiting on this one.

Debits/Impacts

There was discussion regarding the importance of measuring a project creating impacts. There will be a follow up on how to find a project in the appropriate area and a way to measure the impacts of that project.

Projects selected

- Gales Creek
- Yamhill
- 3 projects from Streambank
- Delta Ponds



Counting on the Environment

Ecosystem Credit Calculator

Willamette General Crediting Protocol

Version I: Water Quality, Wetlands, Prairie

April 17, 2009




Increasing the pace, scope and effectiveness of conservation



A product funded by an NRCS Conservation Innovation Grant
 Contact: David Primozych, Primozych @willamettepartnership.org

Ecosystem Credit Calculator Commenter's Checklist

| Documents | Date Available | Action Requested | Date Needed | Completed  |
|--|--|---|----------------------|---|
| General Crediting 1. General Crediting Protocol: Parts I-II 2. A Framework for Integrating Market Assurances 3. General Crediting Protocol: Parts III-IV | April 3 rd April 3 rd April 17 th | We ask commenter's to look at the overall structure of the protocol and whether the Table of Contents seems to capture the information relevant for the different users in the markets (buyers, sellers, third parties, and agencies). We ask that commenter's focus most of their attention on the recommendations housed within the assurances framework. | May 15 th | <input type="checkbox"/> |
| Water Quality | Shade-a-lator available on request | None on the credit calculation methods at this time. We ask water quality stakeholders to focus their comments on the proposed integrated package of assurances. There is no current documentation for nutrients/sediments. This will be created for the Tualatin by August 2009. Documentation for temperature can be found on the Willamette Partnership's website. | N/A | <input type="checkbox"/> |
| Prairie 1. Prairie Credit Calculator 2. Prairie Calculation Guidance 3. Discount factors and scoring | April 3 rd April 3 rd April 17 th | For these documents, we are seeking comments on indicator wording and answer choices and the factors determining the contextual value of the site. After April 17, we will be seeking additional comments on how indicators are rolled into a score for habitat function. | May 15 th | <input type="checkbox"/> |
| Salmonid 1. Salmon Currency Rules 2. Salmon Discounting Factors | April 3 rd April 17 th | The indicators and functions have been extensively vetted. We are asking for commenter's to focus on the weighting factors applied to functions to account for landscape context and the weighting ratios applied to credit estimates to account for risk. | May 15 th | <input type="checkbox"/> |
| Wetlands 1. ORWAP Calculator 2. ORWAP Manual 3. ORWAP Discounting Factor Scenarios | April 3 rd April 3 rd April 17 th | None before April 17. After April 17, we will be looking for comments on the discounting factors and approach for combining ORWAP scores with area to create credits. | May 15 th | <input type="checkbox"/> |
| Field Guide and Pilot Projects 1. Field Guide and Reference sheets 2. Datasheet for everything but wetland 3. Pilot Project summaries | April 3 rd April 3 rd April 3 rd | We ask commenter's to look at the overall structure of the protocol and whether the Table of Contents seems to capture the information relevant for the different users in the markets (buyers, sellers, third parties, and agencies). We ask that commenter's focus most of their attention on the recommendations housed within the assurances framework. | May 15 th | <input type="checkbox"/> |



Ecosystem Credit Calculator Protocol Development Status

V.1 03/31/09

| <u>Process</u> | <u>Credit Type</u> | | | |
|---|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| | Wetlands | Prairie | Salmonids | Water Temp |
| Define method framework | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Compile indicators of site functions | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Translate indicator measures into functional scores | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Test in the field for validity | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Revise based on comments | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Apply discount factors for context and risk | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Apply assurances | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Approve method | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |



Ecosystem Credit Calculator

A product funded by an NRCS Conservation Innovation Grant

COMMENT DRAFT: Willamette General Crediting Protocol

Summary

The Ecosystem Credit Calculator's General Crediting Protocol will provide the overall framework and process for applying the Calculator. It describes why we think we need an integrated approach to credit calculation, and how a project turns from a good idea in a land manager's head into a portfolio of credit types they can sell. The general crediting protocol focuses on process and the currency-specific protocols focus on the credit calculation methods.

The most significant element of the general crediting protocol is an integrated package of assurances developed to make sure those credit estimates offered by sellers provide the ecological benefits they promise. The general crediting protocol is modeled from similar protocols used in carbon markets and from the Temperature Trading Handbook developed by the Willamette Partnership.

Current status and documents included

The general crediting protocol is very much a work in progress. It will evolve as elements of the credit calculation, assurances package, and other market elements develop. There are still major gaps in the protocol where the Working Group and Project Team have not been able to produce content. There are two documents, the protocol itself and recommendations for an integrated package of assurances.

1. General Crediting Protocol Introduction (GeneralCreditingProtocol_040309.doc)
2. A Framework for Integrating Market Assurances (Assurances 4-03-09.doc)



Action needed

We ask that commenters focus most of their attention on the recommendations housed within the assurances framework. We ask commenters to look at the overall crediting process described in the Introduction and whether the Table of Contents seems to capture the information relevant for the different users in the markets (buyers, sellers, third parties, and agencies).

Questions to guide comments

1. Do these assurances capture the most important categories? Is there anything major missing?
2. Which of these assurances do not represent significant value-added over existing practices?
3. Which of these assurances are the highest priority for you?

Submitting comments

Please submit comments by email to Joni Shaffer at jshaffer@willamettepartnership.org before May 15, 2009. Questions can be directed to Bobby Cochran at cochranb@cleanwaterservices.org or 503-681-4435. Thanks!



Ecosystem Credit Calculator

Willamette General Crediting Protocol

A product funded by an NRCS Conservation Innovation Grant

Table of Contents

PART I. INTRODUCTION 10

I.1 Objectives and How to Use the General Protocol 10

I.2 Background on the Willamette Partnership and Counting on the Environment program... 10

I.3 Program Principles and Context 10

I.4 Overview of the Debiting and Crediting Process 11

I.6 Web-Based Debiting and Crediting..... 13

I.7 Technical Assistance 13

I.8 Training and Orientation 13

I.9 Key Questions..... 13

PART II. PROJECT VALIDATION AND CREDIT/DEBIT CALCULATION 14

2.1 Project Definition, Eligibility, & Validation..... **14**

 2.1.1 *Defining Your Project Boundary* 14

 2.1.2 *Supported Credit Types & Project Actions*..... 14

 2.1.3 *Determining Eligibility to Trade & Additionality*..... 16

 2.1.4 *Project Start Date and Crediting Period* 16

 2.1.6 *Example: Getting your Project Validated*..... 17

2.2 Calculating Functional Ecosystem Scores **17**

 2.2.1 *Establishing Your Baseline* 17

 2.2.2 *Establishing Levels of Uplift or Impact* 18

2.3 Converting Functional Scores to Debits and Credits..... **18**

 2.3.1 *Calculating Net Gains and Losses of Ecosystem Function* **Error! Bookmark not defined.**

 2.3.2 *Applying Discount Factors* **Error! Bookmark not defined.**

 2.3.3 *Reporting Formats for Credit and Debit Estimates*..... **Error! Bookmark not defined.**

[SECTIONS III-IV TO BE INCLUDED IN APRIL 17TH DOCUMENT RELEASE](#)

PART III. PROJECT REGISTRATION AND VERIFICATION.....

3.1 Getting Started

 3.1.2 *Registration Summary and Fee Structures*

 3.1.3 *Opening a Registry Account*

 3.1.4 *Submitting Your Credit and Debit Report to the Registry*

 3.1.5 *Registry Guidance and Technical Assistance*

 3.1.6 *Accessing Your Project*.....

3.2 Verification

 3.2.1 *Verification Principles and Process*

 3.2.2 *Professional Judgment*.....

- 3.2.3 Conflict of Interest
- 3.2.4 Reporting and Verification Deadlines
- 3.2.5 Regulatory Agency Role in Verification
- 3.2.6 Key Verification Steps.....
- 3.2.7 Preparing for Verification
- 3.2.8 The Verification Cycle
- 3.2.9 Assigning a Verifier
- 3.2.10 Accreditation of Verification Bodies.....
- 3.2.11 Online Reporting.....
- 3.2.12 Documentation for Review.....
- 3.2.13 Batch Verification
- 3.2.14 Verification Report and Opinion
- 3.2.15 Submitting a Verified Emissions Report to the Registry.....
- 3.2.16 Agency Certification of Verification Report and Opinion.....
- 3.2.17 Record Keeping and Retention
- 3.2.18 Publicly Available Information.....
- 3.2.19 Correcting or Revising Your Credit and Debit Report.....
- 3.2.20 Dispute Resolution.....
- 3.2.21 Key Verification Questions
- 3.3 Credit Sale & Transfer.....
- 3.3.1 Credit Issuance and Listing
- 3.3.2 Transfer.....
- 3.3.3 Retirement.....
- 3.3.4 Transferring Projects Into orFrom the Ecosystem Credit Registry and Another Registry

PART IV. SECTOR PROTOCOL DEVELOPMENT PROCESS.....

- 4.1 Screening Process and Scoping

General Debiting and Crediting Protocol

Part I Introduction 1

1.1 Objectives and How to Use the General Protocol

The Willamette Basin General Crediting Protocol (Protocol) provides market participants (managers, buyers, sellers, and third parties) with the overall framework they need to develop, sell, and buy ecosystem credits in the Willamette River Basin. The information contained in the Protocol was developed under a grant from the USDA Natural Resources Conservation Service and with the guidance of a stakeholder working group. This group is composed of federal, state, and local governments, conservation organizations, potential credit buyers, and potential credit sellers. The Protocol is designed as a general reference guide for activity in the Willamette Marketplace. More detailed protocol documents are available for each credit type supported in the Marketplace. The Protocol is a product of several years' worth of foundational work conducted by hundreds of parties and one year of intense work conducted by the stakeholder Working Group. It describes "Version 1" of an Integrated Ecosystem Accounting System. Version 1 will be updated and adaptively managed as it gets applied. New ecosystem service protocols will be added to it, existing ones will change, and the package will be expanded to new geographies.

1.2 Background on the Willamette Partnership and Counting on the Environment Program

Emerging markets for ecosystem services will connect people in new ways. Markets such as these provide land managers with a new suite of options when it comes to generating profits from their land. Improved water quality, better wetland habitat, increased habitat for fish, and higher quality upland areas represent some of the "products" land managers will soon be able to produce and sell through ecosystem service markets. These markets also provide anyone impacting the environment with viable alternatives for making-up for it—alternatives that meet regulatory standards, reduce costs and fortify natural resources.

The Willamette Partnership formed in 2004 as 501c3 non-profit coalition whose mission is to expand the pace, scope, and effectiveness of restoration. Establishing a marketplace for ecosystem services is a major part of the Partnership's work.

1.3 Program Principles and Context

The Willamette Basin in Northwestern Oregon unfolds between the volcanic cones of the Cascade Range to the East and the forested Coast Range Mountains to the West. Over the last 150 years, the Basin has amassed a large human population and a diversified industrial economy anchored by the Portland Metropolitan Area to the North and the Eugene and Springfield Metropolitan Area to the South.

Amidst all of the Basin's natural amenities and human development, the Willamette River and its tributaries drains enough water to make it the 13th largest river in the lower 48 states. The entire Willamette River Basin includes a land area of around 11,500 square miles, a population of

around 2.5 million and around 75 percent of Oregon's economic activity. This economic activity produces substantial impacts to the environment. All expectations are for the human presence to grow substantially over the next 30 years, along with the impacts such a presence carries with it.

There are several pieces in place to minimize and reduce these impacts (e.g. established prescriptive environmental polices, wetland mitigation banking and species conservation banking), but they do not always work in synergy. The Partnership's work, including the Protocol, is based on the assumption that ecosystem markets should be tied to meeting overall environmental goals rather than just strict interpretations of current rules and program guidelines. As such, the Willamette Marketplace constantly strives to:

1. Produce the highest quality restoration and conservation where it makes the greatest ecological difference
2. Foster transparency, accountability, and credibility in emerging ecosystem markets
3. Facilitate the connections among buyers and sellers that put the greatest amount of resources into real benefits with the least amount of transaction costs

I.4 Overview of the Debiting and Crediting Process

PROJECT DEVELOPERS

The following steps outline the process a land manager would follow to generate, register and sell ecosystem service credits based off of a restoration project.

1. **Site Selection and Validation.** A seller selects a potential site to conduct restoration activities, and works with an approved validator to determine the project's baseline conditions and eligibility.
2. **Initial Credit Calculation.** With a basic understanding of the site's location and the site's potential to generate ecosystem service credits, sellers may then choose to carry on with a more in-depth analysis of the site to determine the exact type and number of credits it can produce using marketplace tools.
3. **Conditional Credit Registration.** Up to this point, potential sellers have evaluated a site's potential to produce ecosystem service credits and conducted the restoration work needed to make them a reality. They now need to open a seller's account on the registry, a step that begins the formal third-party process through which credits will be assessed and approved for entry into the market.
4. **Credit Verification.** It is expected that those interested in generating ecosystem service credits will be acting in good faith. However, to provide assurance to regulators and to the public, all conditionally-accepted credit registrations will undergo independent verification by professionals approved by the market administrator. This process confirms calculations done by (or for) the seller and confirms the work done on the ground.
5. **Credit Issuance.** Certified credits are the only credits available for sale on the Credit Registry. The process through which credits go from conditionally-certified to certified is called the

issuance process. Issuance happens only after verification occurs, the Registry receives a verification report from the verifier and the seller approves of it.

6. **Selling and Transferring Credits.** The actual sale of credits is a straightforward process that mainly involves the seller and buyer. The Registry and the market's administrator will not be involved with any financial transaction between buyers and sellers. The Registry simply receives a report after a transaction is made and moves credits from one account to another.

7. **Track the Credits.** Sellers will need to conduct annual verifications of all credits they develop until the credits are sold. The failure to verify credits will result in their removal from the Registry. Sellers will use the same verifier for the first five years.

BUYERS

The buyers of ecosystem service credits include any public or private entity with a regulatory obligation to reduce the impact of their development actions. Buyers might also include any entity interested in purchasing a credit to retire, use or resell. The process for these buyers to purchase credits demands interaction with many parties and a commitment to the long-term monitoring of restoration projects associated with purchased credits.

1. **Permit Allowance/Validation.** The potential buyers of ecosystem service credits must first receive formal approval from the necessary regulatory agencies to achieve partial or full compliance with their permit requirements through trading credits.

2. **Credit Calculation.** The number of credits a potential buyer is required to purchase depends on the impact that their development action creates. For development actions covered by Version 1 of the Ecosystem Credit Calculator, the process of determining these ecosystem debits follows the same calculation, registration, and verification process that ecosystem credits do.

3. **Set up a Buyer's Account.** Buyers must fill-out a buyer's registration form and submit it to the Registry. Buyers will pay an account origination fee to help defer the costs of managing the Registry. This step publicizes a buyer's intent to purchase credits in the marketplace.

4. **Negotiate and Finalize a Credit Purchase.** The Registry does not set the price of the credits listed, nor does it set the terms and conditions of sales. The price, terms and conditions are all set and agreed upon by the seller and buyer—with the only exception being the monitoring requirements associated with final and ongoing certification.

5. **Annual Monitoring Reports.** The natural landscape is dynamic, requiring the ongoing monitoring of restoration sites to make sure that they continue to provide the ecosystem services credits they were designed to. Sellers will pay verifiers to conduct a full verification of the entire credit calculation process, which is likely to include a site visit, in years one and five of a credit's life. A verifier will also conduct desk audits in years two, three and four. In every instance, the verifier will be selected through a standard process managed by the Registry and paid for by the seller. Sellers are responsible for submitting annual monitoring reports to the Registry, buyer and necessary regulatory agencies.

For a more detailed outline of the credit generation and credit purchase processes, please proceed to Appendix A.

I.6 Web-Based Debiting and Crediting

Version 1 of the Ecosystem Credit Calculator is automated whenever possible. This automation occurs through the use of web-based applications that seamlessly transfer data entered by land managers and those seeking to purchase ecosystem services credits.

The buyers and sellers of credits will most likely interact with three major web-based tools supported by the marketplace: a user interface or market portal that provides public information, direction to participants and a centralized hub for the rest of the market's tools to connect with; a credit calculator that uses data submitted by buyers and sellers to calculate credits and debits; and a registry that performs the credit and debit tracking functions needed to ensure the transparency and legitimacy of the marketplace.

The level of automation, and therefore the overall efficiency of the marketplace, is expected to increase over time.

I.7 Technical Assistance

The market administrator will provide technical assistance to buyers, sellers and regulators encountering difficulties with the use of Version 1 of the Ecosystem Credit Calculator.

I.8 Training and Orientation

Despite automation, and effort to create a practical system that various parties with different types of expertise can use, Version 1 of the Ecosystem Credit Calculator will require that market participants go through some level of training and orientation prior to using it. Web-based training modules will be incorporated into all the major tools associated with Version 1. Training classes, organized by the market administrator, will also be scheduled on demand to accommodate new users of the system.

I.9 Key Questions

Q: Is Version 1 of the Ecosystem Credit Calculator designed for a specific type of user?

A: The Willamette Partnership designed Version 1 to be used by individuals that already possess some specialized training. Targeted users include trained watershed professionals from private consultancies, Soil and Water Conservation Districts and other public or non-profit organizations.

Q: Why does Version 1 calculate unregulated ecosystem services?

A: Version 1 represents a compromise between ecosystem services for which there is already demand, ecosystem services for which demand may soon emerge and ecosystem services that allow for a more comprehensive approach to restoring the entire landscape. This also allows for the voluntary purchase of unregulated credits.

Q: How many different credit types will there be?

Version 1 will support four primary credit types, but as time goes on and more credit protocols are developed and there is demand for other ecosystem services, the Ecosystem Credit Calculator will include new credit types.

Part II Project Validation and Credit/Debit Calculation

2.1 Project Definition, Eligibility, & Validation

2.1.1 Defining Your Project Boundary

Land managers make two types of essential geographic determinations when using the Ecosystem Credit Calculator. The first determination sets the location of the entire area from which the land manager will seek to generate credits (the project boundary).

The second type of determination a land manager makes sets the locations of map units within the project boundary. These map units are based upon the type of credits that a land manager expects to generate and denote that a homogenous resource type is present within their boundaries. A map unit is a section of a property delineated by common habitat type, habitat structure, and habitat elements. These boundaries are first set through the interpretation of aerial photos and then confirmed or adjusted on the ground. A single project site will have as many map units (polygons) as it has diversity in habitat types. By using this map unit approach, the Calculator will be able to calculate multiple credit types on project sites with multiple habitat types. Each map unit will ultimately be dedicated to the production of one of the credit types listed below.

Developers that are assessing the size and scope of their impact will also determine project and map unit boundaries for their initial impact calculations.

2.1.2 Supported Credit Types & Project Actions

The Ecosystem Credit Calculator currently supports a subset of ecosystem credit types and actions that create benefits and impacts. Credit types and their tradable units include:

- Wetland (functional acre)
- Salmonid habitat (functional linear foot)
- Upland prairie habitat (functional acre)
- Water quality: Temperature (kcal/day)

Initial credit type selection was based on market demand and available assessment methods.

Near-term priorities for additional credit-type development include:

- Water quality: Nitrogen, Phosphorus, and Sediment (lbs/yr) [Available in Tualatin River]
- Generalized stream habitat (functional linear foot)
- Carbon (metric ton of CO₂ equivalent)
- Generalized rare habitat (functional acre)

Each of the credit types above may be generated by conducting different types of restoration actions. Over time the Ecosystem Service Calculator shall include more types of credit generating actions. Approved action types are listed in Table 2a.

Table 2a: Version 1 Eligible Conservation Actions by Target Currency (See detailed list of actions in Appendix C)

| Target Currency | Conservation Actions | |
|--------------------------------------|--|--|
| | Version 1 actions | Near-term priorities |
| Water Quality-Temperature | Plant native vegetation | Flow augmentation Floodplain restoration |
| Wetland Habitat | Improve function of an existing wetland | Protect existing wetland |
| | Restore and create wetland hydrology | |
| Salmonid Habitat | Plant native vegetation | Protect existing habitat |
| | Improve In-stream fish habitat: Large wood placement | Restore channel geomorphology: side channels, remeanders, etc... |
| | Improve fish passage: Culvert removal | |
| | Manage sediment inputs: Add fencing | |
| Prairie Habitat | Improve function of an existing prairie | |
| | Restore prairie functions | |
| | Protect existing prairie | |
| Water Quality-Nitrogen & Phosphorous | Crop cover | |
| | Fertilizer use | |
| | Irrigation type | |
| | Manage sediment | |
| | Plant native vegetation | |

Just as there is an approved suite of credit-generation actions, an approved suite of development actions also exists. This set of approved impact-actions may also be expanded in the future (Table 2b).

Table 2b: Version 1 Eligible Development Actions by Target Currency

| Target Currency | Development Actions |
|---------------------------------------|---|
| Water Quality- Temperature | N/A |
| Wetland Habitat | Altered vegetation |
| | Altered hydrology |
| Salmonid Habitat | Altered vegetation |
| | Altered hydrology |
| | Contaminants |
| | Natural system modifications |
| Prairie Habitat | Altered fire |
| | Altered vegetation |
| Water Quality- Nitrogen & Phosphorous | Change crops, fertilizer, or irrigation |
| | Altered vegetation |
| | Contaminants |

2.1.3 Determining Eligibility to Trade & Additionality

Eligibility criteria determine who can buy credits, who can sell them and who can trade them with whom. They are designed to keep out overly-risky or inappropriate projects. For example, before conducting a restoration action and generating credits at a site, land managers must first establish the baseline conditions of the proposed site. This provides a reference for measuring additional benefits but also ensures the site complies with existing regulations and has not been degraded recently. Alternatively, for potential buyers like wastewater treatment plants, they must meet baseline standards for technology before they can trade to meet permitted allowances.

All credited projects need to demonstrate they provide “additional” conservation benefits. The additionality requirement ensures that credits are awarded for doing more than what would otherwise have happened without a market. All credits need to result from restoration actions that are: 1) above and beyond a regulatory threshold for compliance, and 2) above and beyond business as usual.

Not all projects will be eligible to enter the Marketplace. Both buyers and sellers will need to meet some minimum standards for reducing impacts and ensuring credit quality.

2.1.4 Project Start Date and Crediting Period

In general, the start date for a project will correspond to the start of the activity that generates environmental benefits or impacts. Specific requirements for determining the start date of a project are contained in each credit-specific protocol. The crediting period, sometimes called the “life of the credit”, is the period where conservation actions are eligible to receive credits. The crediting period differs by credit type and specifics can be found in each credit protocol. For

example, a wetland credit period is perpetual, a nutrient credit is annual, and a riparian shade temperature credit is good for 20 years.

2.1.5 Receiving a Notice of Validation from the Registry

The first step in entering the Marketplace is getting your project validated. Validation is an optional step for buyers to help determine which credit they might be eligible to buy. Validation is mandatory for sellers. It provides them with an idea of which credits they will be eligible to sell, some technical commentary on project design, and an estimate of how many credits they can expect to receive. The Marketplace's administrator maintains a list of approved validators, who are often the same people accredited to verify credit estimates later in the process. A project developer can choose any validator they want. The validator will help the project developer open an account on the Registry and submit a validation opinion. Validators are also free to provide technical advice on project designs. Generally, if this opinion is complete, it will be automatically accepted by the Registry, but acceptance may differ by credit type. Please review the credit protocols for specifics. Validation is a statement by the Registry to the project developer that they have met eligibility requirements. It is not a confirmation on the quantity of credits issued.

2.1.6 Example: Getting Your Project Validated

WILL BE INSERTED LATER.

2.2 Calculating Functional Ecosystem Scores

Once a project developer has delineated the project boundary, come up with a restoration design, and determined their project eligibility, they are ready to begin calculating credits.

2.2.1 Establishing Your Baseline

The first step is establishing baseline ecosystem functions. The baseline defines the current condition from which a conservation action improves function or a development action impacts ecosystems.

Baseline data collection occurs in two phases. The first phase occurs one in the office through the collection of spatial data and information from existing databases. Sources include aerial photos (surrounding land cover), topography, NRCS web soil survey, Oregon Explorer (species occurrences), DEQ (water quality issues), PRISM Data Explorer (precipitation), and the T-Tools extension (for temperature factors).

The second baseline data collection phase, field data collection, confirms the map unit boundaries defined in the office during validation. As map unit boundaries are confirmed, the field team assigns them unique identifiers and collects data for each map unit within the project boundary.

Data is collected on general location, habitat type, and a variety of performance indicators that are associated with structural conditions and also individual habitat elements. Additionally several "Yes/No" questions are also completed. These questions are used within the database to

trigger certain functional calculations, and also to establish the relationships existing between adjacent map units for calculations within the database. Additionally, if present, information relating to existing restoration efforts or opportunities, current management activities, and observations on wildlife activities will also be noted. The datasheet is designed so that data collected for each map unit is comparable from map unit to map unit and from property to property. The datasheet is also designed to allow for the field surveyor to check the information pertinent to each map unit. Finally, the datasheet is also designed so that the data gathered starts at the general level and then moves to the specific. This was done to help in determining if a map unit boundary has been placed incorrectly.

Upon completion of the field inventory, the data from the datasheets is transferred to the Calculator database. Like the datasheet, the majority of the data is entered through the use of check boxes. In a few instances actual numeric or text data is required to be entered, but these will be formatted within the Calculator database to only accept the correct type of data. The field maps are also reviewed and any changes or additions to the map unit boundaries are digitized to match field conditions.

2.2.2 Establishing Levels of Uplift or Impact

Planned conditions must be compared to existing ones to reach the final credit or debit calculation at a site undergoing restoration or development. Restoration and development designs are therefore needed to calculate the ecosystem change from a baseline to a future condition. The more complete these designs are, the more accurate the calculation of ecosystem change will be.

From these designs, a second set of data is created in the office, based on the management activities that are planned or have been implemented on a site. Essentially, answers to the field survey forms are projects based on these planned conditions. The initial field inventory is completed to establish a current or baseline condition. A second set of map units is created where the implementation of the management activities will have changed the shape or size of the baseline map units. This potential future dataset is also entered into the Calculator database. The final step of data entry is to calculate the area of each map unit for baseline and potential future conditions. This is done within a GIS platform using the XTools extension. This area (in acres) is then transferred to the database. Queries within the database calculate the project area for both baseline and future conditions.

2.3 Converting Functional Scores to Debits and Credits

WILL BE COMPLETED IN MORE DETAIL LATER.

2.3.1 Calculating Net Gains and Losses of Ecosystem Function

After future ecosystem functions are projected, the Credit Calculator simply subtracts baseline condition from future condition to get a measure of ecosystem change by individual or overall function.

2.3.2 Applying Discount Factors

Counting on the Environment's credit/debit calculation system applies weighting ratios to the scoring of ecological functions in order to incorporate the *contextual value* of a site. Ratios are used as incentives for good work and restoration in priority areas. Likewise, applying ratios will provide a disincentive to impacting high priority functions in high priority areas.

The scoring of each ecological function reflects how indicators combine to provide that function on a purely scientific basis. These functions are not sensitive to the context of how the watershed itself and the public benefits from them. Thus functional scores require modification in order to represent their value to society and the broader landscape. For example, a site may score high for its water storage and delay function, but that score must be weighted by the site's opportunity to perform that function and the watershed's relative need for that function.

Weighting ratios in this calculation system can be placed at the function level or at the credit/debit level. The application of ratios at the function level addresses the fundamental mitigation goal of replacing functional performance. Applying weights at the function level also provides a transparency to choices about which functions will receive priority. It provides incentives to address limiting factors with restoration and to minimize or avoid impacts to those functions most important to all of us. (Weights at the indicator level would not necessarily prioritize functions, because indicators appear in multiple functions.)

Weighting ratios applied at the credit/debit level have a much greater influence on the amount of credits/debits that are generated. This application of weighting ratios will direct restoration to priority regions and redirect impacts to sites less critical to the watershed.

The following section use salmonid credits as an example. Weighting factors are under development for prairie and wetland credits. Numerous plans have already been completed for salmonid recovery in the basin which identify limiting factors that must be addressed for the successful recovery of the species. Weighting factors can help push restoration toward the actions that have the greatest ecological benefit, but taken too far they can make a project so costly it never gets done. The challenge is applying these weighting ratios in an objective and consistent way so we get wise mitigation and impact decisions via a predictable process for issuing credits and debits.

Weighting factors for salmon will be based on criteria tied to limiting factors and priority populations in the Willamette Basin. Limiting factors are drawn from the Oregon Dept. of Transportation's Comprehensive Mitigation and Conservation Strategy program, which uses work completed by The Technical Recovery Teams (TRT), National Marine Fisheries and Oregon Dept. of Fish and Wildlife. Some of these threats are not issues that the accounting system can immediately address – e.g., hydroelectric and flood control dams. The draft recovery plan identifies limiting factors and threats that provide a basis for applying weighting ratios.¹ The high priority limiting factors and their links to functional categories are listed below.

¹ Oregon Department of Fish and Wildlife. 2007. Draft Upper Willamette Domain Recovery Plan. Chapter 6, Limiting Factors and Threats to Recovery.

| Threat | Function | Priority |
|--|------------------------|-----------------|
| Land Use: Elevated Water Temperatures | Temperature Regulation | High |
| Land Use: Impaired Physical Habitat (Large wood, channelization, gravels, etc.) | Habitat Formation | High |
| Land Use: Loss of Holding Pools | Habitat Formation | High |
| Hydropower: Low Flows and Reduced Channel Complexity | Channel Diversity | High |
| Hydropower: Low Peak Flows and Reduced Macrodetrital Inputs | Anadromous Support | High |



DISCUSSION DRAFT: A Framework for Integrating Market Assurances

April 3, 2009

I. Introduction

In spite of the best available science, we still can't predict with air tight precision how ecosystems will respond to actions taken by people restoring and developing natural resources. As a result, every type of ecosystem market includes a package of, what is commonly called, assurances. Assurances seek to guarantee the environmental restoration actions completed to offset the impacts of development actually deliver the benefits that they are designed to. Assurances also work to provide process certainty to buyers and sellers in markets. The framework presented below proposes a package of assurances that might be used across many market types. It was developed based on existing market rules, their overlaps and the identification of gaps that could be filled by common approaches.

The framework makes some detailed recommendations drawn from existing rules and practices in wetland mitigation banking, water quality trading, and voluntary carbon markets. Some of the recommendations are hybrids of these and others are newer ideas. We have done our best to document the problem the recommendation is designed to address, the source of the recommendation, and the rationale for choosing it. The recommendations are designed to be as explicit as possible to provoke discussion. In no way are they set in stone, but we are confident they represent a package that will ensure markets produce the environmental benefits they promise. Some of these assurances can be implemented immediately, some will need rulemaking or other administrative action, and some will need further review and evaluation.

Table 1 on the follow page ties the credit issuance process to assurance types and the recommendations presented in this document.

REQUEST FOR COMMENTS

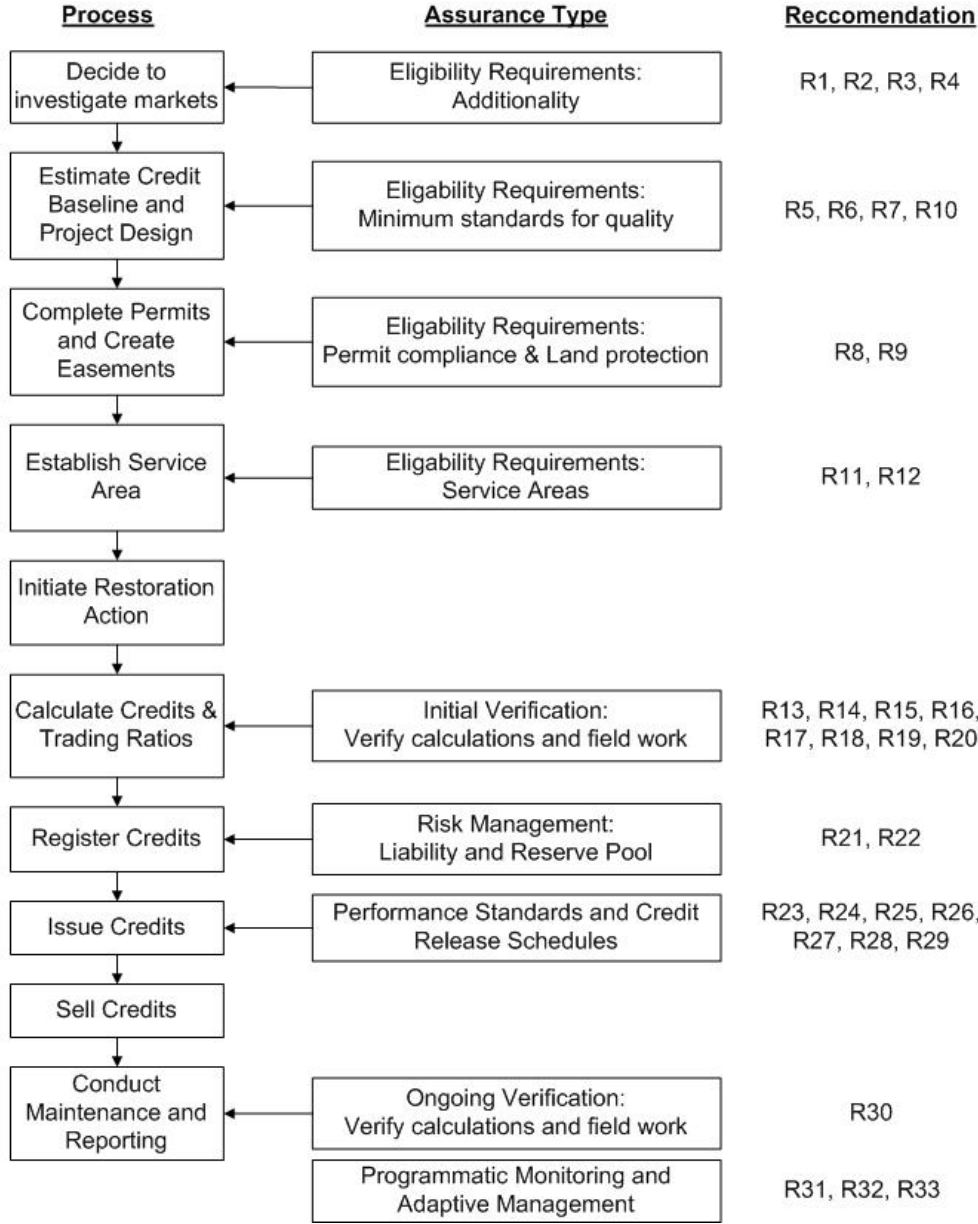
These recommendations are preliminary and meant to spark discussion. We are looking for comments from anyone related to the clarity, sensibility, timing, feasibility, and other characteristics of both the specific recommendations and the characterization of the overall assurances package.

Please submit comments to Joni Shaffer at jshaffer@willamettepartnership.org by May 15, 2009. Questions on the document or recommendations can be directed to Bobby Cochran at 503-681-4435 or cochranb@cleanwaterservices.org.



Assurances: Credit Generation and Sale Counting on the Environment

V.1 03/31/09



II. Background

Uncertainty may be inherent in ecosystem markets. But it can be managed. Uncertainty stems from a lack of knowledge (or inability to assign meaning to that knowledge) and generally comes in three forms: substantive, strategic, and regulatory (Hosterman 2008). Substantive uncertainty comes from the dynamic character of ecosystems. Floods deposit and scour soil, fires destroy some habitats and create new ones, and invasive species upset the ecological equilibrium. All of these forces alter, sometimes radically, existing natural conditions—and there is not much people can do to control them. Next, strategic uncertainty stems from the new relationships formed among ecosystem market participants. Many landowners may not be willing to participate in markets, thereby reducing the supply of such services. On the other hand, industrial buyers may go bankrupt, thereby reducing demand. In either case, formerly isolated groups will be affected by each other’s choices and condition. Lastly, regulatory uncertainty is generated by the flux or opaqueness of government policies and market rules. What is required by the producers and buyers of ecosystem services today may not be required tomorrow, making planning difficult. Together, these three forms of uncertainty raise questions about whether a restoration project will perform its intended functions, who is liable if it does not, and how the marketplace will account for their success or failure. Just as it is possible to articulate the sources of uncertainty in ecosystem markets, it is also possible to articulate and estimate the relative quantity of these uncertainties. In this paper, quantified uncertainty is called risk.

In 2008, Heather Hosterman, working with The Nature Conservancy, captured some ideas on assurances for the Practitioner’s Working Group of the Willamette Partnership. Many of the ideas in this paper are taken from her final report to the Willamette Partnership. The Working Group identified several risk factors that, if managed well, will lead to more successful credit projects or transactions. These are detailed in Table 2.1 below.

Table 2.1: Environmental Market Risk Factors

| Risk Factor | Description |
|--|---|
| Quality of the original site (locally and for broader landscape) | If a site and its adjacent land cover meets a certain set of criteria (e.g. low invasive cover, adjacent to natural lands, located in a priority, etc...), it is more likely to produce lasting ecological value. |
| Suitability of the restoration design | If a site is restored to historic or reference conditions, it is more likely to reach its site system potential. |
| Qualifications of the land-manager and/or restoration practitioner | If a manager or practitioner has experience, capacity, and a restoration mission, they are more likely to deliver a successful restoration project. |
| Timing of credits related to impacts | Credits created after an impact has occurred increase temporal loss of function and create a risk that functions lost may not be replaced if the restoration does not perform as planned. Credits released before performance standards |

| | |
|--|---|
| | are reached increase the risk that the project may never meet these standards. |
| Known effectiveness of development and conservation action | The response of ecosystems to some human actions is much better understood than others. Wetland restoration generates more predictably measurable benefits than wetland creation. |
| Long-term management (plan, person, and funds) | Sites that are protected with long-term leases or easements, have money set aside for management and have someone in charge of them are more likely to sustain their benefits. |

III. Responses to Risk

Markets use a variety of assurance tools to address sources of uncertainty and the risk factors described above. These tools include:

- Eligibility criteria for the impacts and benefits that are creditable and the trades that are appropriate;
- Verification rules for monitoring conditions on the site in relation to performance
- Liability, trading ratios, and other forms of risk-management;
- Performance standards and credit release schedules; and
- Programmatic monitoring and adaptive management.

The sections below describe each of these assurance tools in more detail.

3.1. Eligibility Requirements

Eligibility criteria determine who can buy credits, who can sell them and who can trade them with whom. They are also designed to keep out overly-risky or inappropriate projects. In many markets, eligibility is determined by a process called “validation”. For example, before conducting a restoration action and generating credits at a site, land managers must first establish the baseline conditions of the proposed site. This provides a reference for measuring additional benefits but also ensures the site complies with existing regulations and has not been degraded recently. Alternatively, for potential buyers like wastewater treatment plants, they must meet baseline standards for technology before they can trade to meet permitted allowances. For agencies and market managers, they can document that buyers have completed their obligation to avoid and minimize impacts.

Service areas (also called trading areas in some markets) are another type of eligibility requirement. In wetlands markets, buyers and sellers must come from the same watershed (e.g. the 4th field hydrologic unit). In current wetland and water quality markets, trading between different watersheds is generally prohibited in order to keep impacts and restoration actions relevant to one another. This may be different for species that cross watershed boundaries. Projects may also set minimum design qualifications as a type of eligibility requirement. For example, projects need appropriate restoration designs that include target species, habitat elements, and diversity. Wetland banks may need a conservation easement. Restoration design may need to be targeted toward a reference site, historic conditions or some theorized optimum condition.

Eligibility criteria have pros and cons. Stricter eligibility criteria generally lead to fewer projects that will actually be able to enter the market. However, the ones that do enter have a better chance of succeeding.

3.2. Verification Rules

Credits traded in a marketplace only have value if participants – buyer, regulators, sellers, and the public – know sites are achieving required performance standards. They seek, in other words, verification. Verification can take on many forms. It can be conducted by agency staff, independent third-parties or by the buyers and sellers themselves. In wetland banking, verification occurs in two ways: by sellers submitting monitoring reports and by agencies conducting annual site visits to confirm those reports. In carbon markets, independent third parties conduct verification on behalf of buyers and sellers. In many water quality markets, buyers are responsible for verifying the credits they buy.

Verification answers two general questions. Are project developers complying with market rules and procedures? Is the site achieving performance standards established by the market? Verification can be conducted on an intensive annual basis, or in cycles of single-party check-ins punctuated with full-verification by an agency at a less frequent interval. Verification may also vary in the type of information that is evaluated. Sometimes verifiers check to make sure decisions and credit estimates are well-documented, other times they may re-run credit or debit calculations to see if modifications to credit calculations need to occur based on performance. Another important element of verification is a clear dispute resolution clause in case verifiers and buyers or sellers cannot agree on credit estimates. The advantage of formal verification is a predictable process that takes buyers and sellers from a credit estimate to documentation that regulatory requirements are met and key issues are decided.

Once credits have been verified, they may also go through a process of credit issuance. Generally, issuing credits is an office task of ensuring all the paper work, documentation and rules are in place. For regulated markets, agencies are the entities that issue credits even if a registry assigns serial numbers for tracking and accounting purposes.

3.3. Risk Management

This catch-all category covers liability rules, trading ratios and other tools markets use to manage risk. In many markets (wetland mitigation banking, species and carbon for instance) permit liability for the performance of credits lies with the seller. In water quality trading and permittee-sponsored wetland mitigation, permit liability remains with the buyer. Generally, liability is a costly proposition. It causes water-quality buyers to hesitate when buying credits and it causes higher prices for many sellers in habitat mitigation markets. For agencies, the question of permit liability is critical. Permits are their mechanism for enforcement, so markets must make it clear where liability lies. Given the expenses associated with liability, some markets have generated ways to share it. For example, a trade association in the North Carolina's Neuse River accepts liability on behalf of a set of water quality buyers.

Trading ratios are another common way to deal with uncertainty and risk. Trading ratios are designed to account for many things, including: the likelihood a project itself will fail, the time it

takes for an action to deliver the benefits it promises, a safety factor for environmental benefit, and the contextual value of a credit in relation to a debit. Trading ratios might also be used to provide incentives for desired actions, investment in priority locations or other environmentally-beneficial actions not captured directly in the debit or credit estimation. For the Counting on the Environment program, trading ratios are included as part of the credit calculation metrics and not a part of the assurances framework.

Markets use other forms of risk management as well. Sometimes wetland bankers are required to purchase performance bonds during construction. The Great Miami program in Ohio established a reserve pool of credits to act as insurance against some of its projects failing. In carbon, the Voluntary Carbon Standard Association requires the retention of “buffer” credits to create a reserve. In both of these cases, project sponsors can only actually sell a portion of the credits their projects generate.

3.4. Performance Standards and Credit Release Schedules

Many markets phase their release of credits over time based on achievement of pre-defined performance standards. Doing this accounts for the fact that the exact benefits of a restoration project are often difficult to predict prior to initiating the work of restoration. In addition, the benefits of restoration typically accumulate over time with active management. The performance standards associated with phased credit releases might include the following: a maximum percent cover of invasive species, a target level for depth to saturation in wetlands, the presence of target species or the implementation of planned practices.

3.5. Programmatic Monitoring and Adaptive Management

There is very little systematic evaluation of most ecosystem markets. Largely, these markets are new and represent a small fraction of the total conservation or development activity in a region. That said, programmatic monitoring and a defined adaptive management plan can go a long way toward mitigating risk. There needs to be a process for rolling verification and site-level monitoring reports into a programmatic picture linked to landscape-level monitoring that includes a full suite of conservation actions and continued impacts.

There also needs to be a predictable schedule and process for updating credit calculation methodologies and market rules to respond to lessons and feedback generated by market activity and new science. These feedback loops that are transparent and fixed for some period of time allow people to take initial actions to learn. But they also adapt in a predictable way, allowing planners to make significant investments with a higher degree of certainty on what their return on investment will be.

IV. Recommendations for an Integrated Assurances Package

The following recommendations are taken from a variety of sources including existing rules and practices in wetland mitigation banking, water quality trading, and voluntary carbon markets. Some of the recommendations are hybrids of these and others are newer ideas. We have done our best to document the problem the recommendation is designed to address, the source of the recommendation, and the rationale for choosing it. The recommendations are designed to be as explicit as possible to provoke discussion. In no way are they set in stone, but we are confident they represent a package that will ensure markets produce the environmental benefits they promise. Some of these assurances can be implemented immediately, some will need rulemaking or other administrative action, and some will need further review and evaluation.

4.1. Eligibility Criteria

As a type of assurance in markets for ecosystem services, eligibility criteria apply to sellers, buyers and to the trades themselves. Eligibility criteria, as noted earlier, serve as minimum standards designed to keep out inappropriate projects or trades. Setting the height of these standards is likely to be an iterative process, reflecting conservation objectives and market conditions. In new markets, a significant amount of time is spent between project developers and agencies. Eligibility criteria can help ensure time is spent on the projects with the highest likelihood of success and avoid conflicts tied to inappropriate projects or trades.

4.1.1 Additionality

All credited projects need to demonstrate they provide “additional” conservation benefits. The additionality requirement ensures credits are awarded for doing more than what would otherwise have happened without a market mechanism in place. Recommendation R.1 borrows from the additionality requirements in carbon markets, and particularly from The Climate Trust guidance based on the Kyoto Protocol and WRI guidance (http://www.climatetrust.org/solicitations_2007_Additionality.php).

R.1: All issued credits result from restoration actions that are 1) above and beyond a regulatory threshold for compliance, and 2) above and beyond business as usual. Defining “business as usual” will be based on a set of questions answered by the landowner during the project validation process.

Many existing markets are focused on restoration and do not provide strong incentives for preserving high quality habitat. In this situation, eligibility requirements can also be used to guard against an incentive to destroy good habitat just to later restore it for credit. The balance lies in providing room for new landowners who want to reverse actions of past landowners to get credit for their actions. Recommendation R.2 is based on The Climate Action Reserve’s forest carbon offset protocol for reforestation projects (<http://www.climateregistry.org/tools/protocols/project-protocols/forests.html>), which states that lands cannot have been subject to intentional, significant disturbance from the landowner in the

last 10 years. Recommendation R.3 is based on the 1985 Food Security Act requirements, and Recommendation R.4 allows new landowners, land trusts, and others to reverse actions taken by previous landowners.

R.2.: Require that all credits result only from restoration actions that occur a minimum of 10 years after a significant, intentional development action on the site. For example, a landowner would be ineligible to sell credits for restoring riparian forest if they had removed any portion of a pre-existing riparian forest in the last 10 years.

R.3.:For wetland projects, any restoration action occurring on prior converted or farmed wetland according to the 1985 Food Security Act are eligible for credits. If a wetland has been converted in the last 10 years, it is not eligible. Standard agricultural and forest practices occurring on wetlands would not necessarily preclude credit eligibility.

R.4. If land changes hands from the landowner conducting the development action to a new land owner conducting the restoration action, the second landowner would be eligible to sell credits.

Comment [c1]: This is meant to allow someone with a conservation interest (e.g. land trust or banker) to acquire a degraded parcel and turn it around. As written, it does not protect against transfers to a cousin or LLC.

4.1.2 Minimum quality standards

Creditable projects also need to meet a minimum standard of quality. The time and investments required to create, verify, and register credits is significant. Quality standards help save people time and money by ensuring good site selection and project design. Recommendations R.5-R.7 are based on riparian restoration goals in the Dept. of Environmental Quality's (DEQ) draft Internal Management Directive on trading.

R.5.: If a restoration action includes planting as a component, that planting must consist of locally-sourced native species to the extent available.

R.6.: Planting must consist of suitable diversity and maturity, which are planted at established density levels based on appropriate reference conditions. Each market will set minimum standards.

R.7.: For riparian planting, the planting plan should include an appropriate mix of trees AND shrubs (e.g. no less than 20% of stems as trees and no less than 20% of stems as shrubs).

4.1.3 Land protection

Creditable projects will also need to include land protection agreements to sell credits. These requirements may vary by market, but land protection ensures benefits are protected as landowners may change. Long-term agreements that run with the land, such as easements, are always preferable to short-term contracts. Yet, requiring permanent easements is a significant barrier to entry and is not recommended for temporal impacts. Recommendation R.8 is based on current wetland rules and DEQ guidance on temperature trading.

R.8.: For permanent impacts (e.g. wetland removal and fill or species take), creditable projects need permanent conservation easements or equivalent (deed restrictions, covenants, or

agreements from public agencies)t. For temporal impacts (e.g. air or water pollution), creditable projects, at a minimum, need a lease covering the crediting period of the project. For example, if nutrient reductions are sold for five years, there needs to be at least a five year lease with the landowner to protect those reductions.

4.1.4 Buyer eligibility

Buyers will also need to meet some minimum standards before accessing markets. These standards are often set in agency rules. This includes targeting credit purchases to priority restoration and conservation areas. Recommendation R.9 is based on Clean Water Act requirements for NPDES permits and removal-fill permits.

R.9: Require that buyers avoid or minimize the impact of their development actions, by being in full compliance with all relevant laws and rules related to offsetting their impact through the best practicable technology and practice, prior to using credits to offset impacts. Agencies will provide buyers with documentation if this requirement is met at the planning level and/or design level of an impact project.

In DEQ's temperature trading guidance, there is a proposed requirement for permitted buyers to purchase a percentage of their credits from a priority area. Investment in priority areas will be incentivized in the Credit Calculator's methodology. Projects in high value areas will get more credits. Most markets deal with priority investment on the seller's side. This requirement for buyers guarantees investment in priority areas.

R.10: Require that buyers maximize their credit purchases from priority locations as defined for each market.

Comment [c2]: Some markets may not be able to direct buyers in this way (e.g. if policy favors one supplier over another). May also not be feasible for buyers offsetting all their impacts from one site, since their choice of site selection will be constrained.
May change "require that" to "urge"

4.1.5 Trade and service areas

Most eligibility will be dealt with as buyers and sellers access markets, but some trades are not appropriate. Service/trading areas make it clear market participants which types of buyers and sellers can conduct trades with each other. Recommendation R.11 comes from current defaults in wetlands and water quality trading programs in Oregon.

R.11: Require all trades abide service area restrictions specific to the currency being traded. For wetlands, salmonids, and water quality, the 4th-field hydrologic unit is the default size of the service/trading area unless a compelling case can be made by any party to expand or constrict the size.

R.12: For prairie and other species, the Willamette Basin is the default size of the service/trading area unless a compelling case can be made by any party to expand or constrict the size. Recovery Plan area will be defined as the service area for listed species with recovery plans.

4.2 Verification and Credit Issuance

Similar to eligibility criteria, verification and credit issuance are types of assurance that apply to sellers, buyers and individual trades. Verification is the process of taking credit estimates produced by project developers, confirming that the project meets the market's minimum quality standards and eligibility, that the quantity of credits were estimated accurately, and that all procedures have been followed and documentation is in place. Verification can range from intense, re-running of calculations and visits to the site, to office review of monitoring reports that confirm no significant changes have occurred. Intense verification is often referred to as "full" or "complete" verification, and the check-ins are often termed "partial" verification. Credit issuance is the act of the market manager to review the verification report and the credit proposal and issue credits. Carbon markets have developed the most standardized processes for credit verification and issuance. Recommendations R.13- R.20 are drawn from the Climate Action Registry's General Verification Protocol

(<http://www.theclimateregistry.org/resources/verification/verification-process-overview.php>) and the Willamette Partnership's Temperature Trading Handbook (www.willamettepartnership.org).

Currently, public agencies fill both the verification and the credit issuance role in many markets. For example, the Interagency Review Team (IRT) for wetland mitigation banks verifies projects via annual site visits and issues credits as it authorizes credit releases. The process is often conducted on a case by case basis, which builds some uncertainty into the system for buyers and sellers. Recommendations R.13-R.20 are modeled off of a third-party verification system with agencies retaining the role of issuing credits. This model is different from current practices in markets like wetlands, but can still work in a system where agencies fill the verification roll.

R.13: Require that all credits, prior to receiving certification and being placed on a registry, undergo verification by a neutral third-party and certification by an agency/market administrator.

R.14: Require that a market administrator accredit a pool of qualified verifiers. Verifiers will be assigned randomly to projects from that pool.

R.15: Require a five-year verification cycle where all credits undergo a full verification in Year 1, which includes confirmation that the credit calculation was done correctly and confirmation that the supporting data accurately represents conditions in the field, when they are first submitted to the registry. Annual, partial verification of monitoring reports submitted by sellers will be conducted in Years 2-4. Site visits in years 2-4 are not required, but can occur at the discretion of the verifier or the responsible agency. Another complete verification will be conducted in Year 5. Verification cycles continue through the life of all credits.

R.16: For permanent impacts, verification will occur in two phases. Phase I is described by the cycle in R.15 and continues through the development life of a credit project. As a project moves into long-term management, only a full verification will occur every five years, and only if required by the agencies/market administrator.

R.17: Require that the debits a buyer is accountable for be verified with the same level of rigor as the credits a seller produces. As buyers move through verification, re-opening clauses in agency or market agreement are minimized.

R.18: Require that verifiers themselves be responsible for avoiding any conflicts of interest, including agreement to a conflict of interest code and changing verifiers for a given project every five years.

R.19: Agencies will certify the reports submitted to the registry by verifiers and issue credits unless they delegate certification to a third party. Credits generated by mitigation done in advance of impacts and in accordance with market rules will count toward future impacts.

R.20: Require the verification of trades through a single credit registry maintained by the agency or a third party market administrator. Require the registry to serialize credits, a process that attributes a unique identifying number to each credit that ties it back to its place of origin, so no credit can be sold more than once. Require annual reporting and that all documentation emerging from the credit verification process be readily available on the registry for agency and public review. In the case where credits can be re-sold, transferred to third parties, or are otherwise fungible, the seller shall remain responsible for verification, and the registry shall track the credit serial numbers and quantities for each account holder.

4.3 Risk Management

In many ways, all assurances are a form of risk management, yet there are three tools commonly used in markets to manage risk. These include the liability rules for who is responsible if a project fails or if something goes wrong, trading ratios or discount factors applied to credits and debits, and increasingly, forms of insurance to account for project failure. For this project, discounting and trading ratios will be incorporated as part of the credit calculation methodology and are not addressed here.

4.3.1 Liability Rules

For existing markets, liability rules are fairly well established. There are two forms of liability. Regulatory liability stems from permits or agency enforcement rules and contract liability that rests in the agreement between buyers and sellers. In most cases, regulatory liability is transferred from buyers to sellers of ecosystem credits. This is true for wetlands, species, and carbon markets. Once an agency approves a buyer's mitigation plan, and the buyer purchases credits, the buyer is not responsible for the performance of credit projects. This is not true for most water quality trading programs, where the buyers or point sources holding discharge permits remain liable. There are some examples of water quality trading programs where a third party or buyers association has taken on collective liability for its member point sources. Unclear liability rules is a problem in many markets, creating hidden costs, distorting credit prices, and causing hesitation for people to enter the market. Recommendation R.21 maintains the status quo for liability in current markets but recommends the model used in wetlands for releasing buyer liability upon purchase of credits.

R.21: Retain liability rules for current markets. For new markets (e.g. prairie and salmonids), transfer regulatory liability from buyer to seller upon purchase of the necessary credits.

4.3.2 Reserve Pools

Increasingly, many markets are using financial insurance and reserve mechanisms as a replacement or supplement to trading ratios. The Voluntary Carbon Association requires a project to hold a percentage of its credits back in reserve in case a project fails. The entire program maintains a reserve to protect the whole program in case an individual's insurance pool cannot cover the loss. The Great Miami water quality trading program uses trading ratios to account for uncertainty, but it dedicates the initial credits generated from those ratios to hold in reserve. Other carbon markets require financial insurance to cover the costs of replacing restoration projects. Wetland markets require performance bonds on many of its banking projects. Performance bonds and insurance cover financial risk, by paying out cash when something goes wrong. Reserves cover ecological risk, covering environmental losses by the reserve of credits. Recommendation R.22 uses the Voluntary Carbon Association model of a reserve pool of credits populated through discount factors in the credit calculator to act as a reserve pool.

R.22: Create a Reserve Pool of credits managed by a regional market coordinator that can be accessed as a last resort for projects that fail because of force majeure or other acts beyond control of the seller, or for project failures that cannot be resolved. In the last case, sellers will need to rent credits from the reserve to provide to buyers until they can arrange to resupply buyers' accounts. In addition, government or other funding may choose to invest in the reserve to acquire more credits/fund more projects to create a stronger back-up to their trading programs. A performance bond or other up-front financial insurance could be used to ensure the money is available to acquire reserve pool credits in cases where a project developer goes bankrupt, or otherwise is unable to cover the costs of accessing the reserve.

4.4 Performance Standards and Credit Release

Ideally, performance standards and management goals will be based on a local reference site. If a local reference site is not available, historical conditions and/or a proxy condition pieced together from other sources can be used. The standards below are drawn from the state's wetland mitigation banking template and the planting goals in DEQ's Internal Management Directive guidance. Mitigation in advance of impacts is always preferred, but not always feasible.

4.4.1 Performance standards

Generally, all projects will have performance standards that they must meet over a given time period that can be verified through annual monitoring. The implications and resolutions for missing performance targets will vary by market. Recommendation R.23 represents a combination of emerging standards in Oregon's wetland mitigation banking program and planting guidelines for the temperature market.

R.23: The targets below represent some of the typical minimal standards:

- A. Less than 15% mean aerial cover of non-native invasive plants over the credited area*
- B. Greater than 55% mean aerial cover of native plant species over the credit area*
- C. For species markets, there is presence of target plant and/or animal species or their habitat (e.g. Kincaid's lupine or salmon habitat)*
- D. For wetlands, wetland hydrology and vegetation, as defined in the 2007 Arid West Supplement to the 1987 Corps Wetland Delineation Manual (U.S. Army Corps of Engineers 2006), shall be present in the wetland area within the first 5 years after construction”.*
- E. The registry will also track progress toward meeting other conditions and commitments made by buyers or sellers as part of their permits/agreements*

4.4.2 Credit release schedules

In some markets, credits are released upon completion of the action. In others, they are released over a phased schedule. In either situation, “advance credits” are those credits released for sale before the project is delivering the fully estimated suite of ecosystem services. Sellers often need to sell advance credits to fund the ongoing construction and maintenance of a project. Yet, as more advanced credits are released, there is greater risk that impacts aren’t fully mitigated. Recommendations R.24-R.29 is based on Oregon wetland mitigation banking guidance.

R.24: No more than 30% of the total estimated credits for a project site can be released in advance without adjusting the trading ratio. In the case of temperate markets, the trading ratio is adjusted up to 2:1 to account for the 100% release of advance credits.

R.25: For advance release, the credits need to be verified and issued based on as-built designs, land protection agreements need to be in place, and the major construction phase of the project must be complete (e.g. channel work, hydrological modification, planting, etc...).

R.26: When the project achieves its first suite of performance targets, up to 50% of the credits can be released.

R.27: When it reaches its second suite of performance targets, up to 80% of the credits can be released.

R.28: Once a project has reached all of its performance targets and a long-term management plan is in place and functioning, and remaining credits can be released.

R.29: If a project reaches 100% of its performance targets sooner than anticipated, and a trading ratio had been applied for releasing greater than 30% of credits in advance, some of these credits can be returned and made available for sale at the sole discretion of the lead agency.

4.5 Programmatic Monitoring and Adaptive Management

Managing emerging markets is an iterative process. To the extent possible, adaptation needs to be designed into the market in a predictable way. In many markets, there is an unclear link between the project-level monitoring needed to verify and issue credits and the programmatic level monitoring needed to evaluate overall performance. As a result, there are incomplete pathways for adapting programs to address new information or adjust for performance problems. Recommendations R.30-R.33 were adapted by the Great Miami water quality trading program in Ohio (http://www.miamiconservancy.org/water/quality_credit.asp). None of these recommendations would affect the credits previously issued to market participants.

R.30: Project-level monitoring will be conducted using the Integrated Ecosystem Credit Calculator methods as part of the annual verification cycle to maintain credits.

R.31: Verification reports will be stored in a central database and made available to the public and managing agencies to assess progress and performance of programs. Data from verification reports needs to be linked to a landscape-level monitoring plan. Individual market participants will not be liable for program/overall market performance.

R.32: In addition, 15% of credited projects should be monitored in detail every year by a third party for the purposes of program evaluation, not credit evaluation. This monitoring information will not affect the allocation of credits to those projects. This information will be used to adjust credit calculators, assurances, and other program elements on a two-year cycle.

R.33: Rule changes that have a major impact on existing market participants will be limited to those two-year windows.



Ecosystem Credit Calculator

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COMMENT DRAFT: Willamette Water Quality Crediting Protocol

Summary

The Ecosystem Credit Calculator's Water Quality Crediting Protocol is based on two sets of models. The temperature crediting portion is built from the Dept. of Environmental Quality's Heat Source Model and Shade-a-Lator version 6.2. The nutrient and sediment portion will be constructed and piloted in the Tualatin basin based on the Agricultural Policy Extender model developed by USDA Natural Resources Conservation Service and the Texas Institute for Applied Environmental Research. The temperature credit portion can be applied to riparian revegetation, and the nutrient/sediment portion can be applied to changes in irrigation, crop cover, fertilizer use, tillage, and use of filter strips. The protocol cannot be applied on the debiting side to point source discharges. Other models will be used. The model can capture the temperature or nutrient contributions from actions taken on the site level that alter land cover and land use. The protocol requires users to first define the assessment area, then divide the site into subunits, and then answer questions tied to indicators. These are used to feed models that generate quantities of temperature or nutrient/sediments reduced at the edge of the field or stream. The output of the protocol is a kilocalorie/day for temperature and a pound/year for nutrients and sediments.

Current status and documents included

The temperature crediting protocols have been vetted extensively. A temperature handbook is available on the Willamette Partnership's website and the Dept. of Environmental Quality has issued guidance on trading. For temperature, some additional work is needed to standardize which model version gets used and which assumptions for vegetation heights are used. For nutrients, work needs to be done to calibrate the models for crops, management practices, and other conditions in Oregon. Work also needs to be completed around discount factors tied to contextual value, delivery of nutrients from field to stream, and then from stream to point of concern.

Action needed

None on the credit calculation methods at this time. We ask water quality stakeholders to focus their comments on the proposed integrated package of assurances. There is no current documentation for nutrients/sediments. This will be created for the Tualatin by August 2009. Documentation for temperature can be found on the Willamette Partnership's website.

Questions to guide comments

1. None at this time

Submitting comments

Please submit comments by email to Joni Shaffer at jshaffer@willamettepartnership.org before May 15, 2009. Questions can be directed to Bobby Cochran at cochranb@cleanwaterservices.org or 503-681-4435. Thanks!





Ecosystem Credit Calculator

A product funded by an NRCS Conservation Innovation Grant

COMMENT DRAFT: Willamette Upland Prairie Crediting Protocol

Summary

The Ecosystem Credit Calculator's Upland Prairie Crediting Protocol uses a new approach developed by Paul Adamus working with a technical group of prairie experts. The prairie protocol captures the habitat functions provided by upland prairies. The credit protocol can be applied to prairie protection, restoration, and enhancement on the crediting side and site-level actions that alter vegetation or other natural systems on the debiting site. The protocol requires users to first define the assessment area, then divide the site into subunits, and then answer questions tied to indicators used to generate scores for a score for habitat function. This score is then weighted based on patch size, connectivity of the site to other prairie patches, and permeability of the site. The output of the protocol is a functional-weighted acre.

The protocol provides for optional indicators based on more detailed plant lists or plot data.

Current status and documents included

The current documentation includes an Excel Workbook with the field datasheet, species lists, and calculator for the site's contextual value. It also includes the beginnings of the additional steps needed to calculate prairie credits. By April 17, we will release additional documentation that rolls the scores for indicators into an overall score for habitat function and describes how discounting will work based on contextual value and risk.

3. Prairie Credit Calculator (PrairieCreditCalculator4.xls)
4. Prairie Calculation Guidance (Steps for using Prairie method April 01_09.doc)



Action needed

For these documents, we are seeking comments on indicator wording and answer choices and the factors determining the contextual value of the site. After April 17, we will be seeking additional comments on how indicators are rolled into a score for habitat function.

Questions to guide comments

2. Do the algorithms turning indicators into scores for ecological function work?
3. Do the discounting factors capture priorities for the context and risk tied to success?
4. Do the discounting factors present a feasible and economical framework?

Submitting comments

Please submit comments by email to Joni Shaffer at jshaffer@willamettepartnership.org before May 15, 2009. Questions can be directed to Bobby Cochran at cochranb@cleanwaterservices.org or 503-681-4435. Thanks!



Ecosystem Credit Calculator

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COMMENT DRAFT: Willamette Salmonid Crediting Protocol

Summary

The Ecosystem Credit Calculator's Salmonid Crediting Protocol uses a library of methods compiled by Paramatrix, INC as its base for credit and debit calculations. The credit protocol can be applied to riparian revegetation, large wood placement, culvert removal, and riparian fencing on the crediting side and site-level actions that alter vegetation, hydrology, contaminant levels, or other natural systems. The protocol requires users to first define the assessment area, then divide the site into subunits, and then answer questions tied to indicators used to generate scores for seven site-level ecosystem functions. These functions are then weighted based on their connection to priority limiting factors in the watershed. The output of the protocol is a functional-weighted linear foot that reflects the percentage of ideal functionality a stream reach provides for salmonids.

The Paramatrix library of methods was developed through work with the Oregon Department of Transportation, Oregon Trout, internally-directed work, and other partners that worked extensively on the kinds of indicators and functions needed to define salmonid habitat.

Current status and documents included

The current documentation includes documentation describing each indicator, and explanation of the discounting approach recommended, and a field reference guide.

5. Salmon Currency Rules (XXXX.pdf)
6. Salmon Discounting Factors (XXXX.doc)
7. Salmon Field Guide (XXXX.pdf)



Action needed

The indicators and functions have been extensively vetted. We are asking for commenters to focus on the weighting factors applied to functions to account for landscape context and the weighting ratios applied to credit estimates to account for risk.

Questions to guide comments

1. Do the discounting factors capture priorities for populations and limiting factors?
2. Do the discounting factors present a feasible and economical framework?

Submitting comments

Please submit comments by email to Joni Shaffer at jshaffer@willamettepartnership.org before May 15, 2009. Questions can be directed to Bobby Cochran at cochranb@cleanwaterservices.org or 503-681-4435. Thanks!



Ecosystem Credit Calculator

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COMMENT DRAFT: Willamette Wetland Crediting Protocol

Summary

The Ecosystem Credit Calculator's Wetland Crediting Protocol uses Version 2 of the Oregon Rapid Wetland Assessment Protocol (ORWAP) as its base for credit and debit calculations. The credit can be applied to wetland enhancement, restoration, and creation on the crediting side and removal/fill actions that alter wetland vegetation and hydrology on the debiting side. The protocol requires users to first define the wetland assessment area, and then answer questions tied to roughly 150 indicators to get scores for site-level ecosystem functions. ORWAP also produces scores to the landscape-level values, and the ecosystem services that the site produces for surrounding communities.

ORWAP was developed by Paul Adamus under contract with the Oregon Dept. of State Lands and with guidance from a Technical Advisory Committee convened by State Lands. It has undergone extensive vetting, repeatability, and sensitivity analysis. It is scheduled for adoption by State Lands and the Army Corps in late April 2009. This protocol takes the ecosystem service scores produced by ORWAP, combines them with area, to produce an estimate of marketable credits or debits.

Current status and documents included

The current documentation includes an Excel sheet with the ORWAP data sheets, algorithms, and outputs. It also includes a field manual to guide users of the methodology. By April 17, this protocol will also include several options for combing ORWAP scores with area to produce credits.

8. ORWAP Calculator (ORWAP_calculator_April01_09.xls)
9. ORWAP Manual (ORWAP_Manual near-final draft_March 30.doc)



Action needed

None before April 17. After April 17, we will be looking for comments on the discounting factors and approach for combing ORWAP scores with area to create credits.

Questions to guide comments

1. There are several options for turning ORWAP scores into measures of credit. Which of these options make the most sense to you? What are the pros and cons of each?
2. Do the discounting factors presented maximize potential ecological gains?
3. Do the discounting factors present a feasible and economical framework?

Submitting comments

Please submit comments by email to Joni Shaffer at jshaffer@willamettepartnership.org before May 15, 2009. Questions can be directed to Bobby Cochran at cochranb@cleanwaterservices.org or 503-681-4435. Thanks!



Counting on the Environment

Ecosystem Credit Calculator

Willamette General Crediting Protocol

Version I: Water Quality, Wetlands, Prairie

April 17, 2009




Increasing the pace, scope and effectiveness of conservation



A product funded by an NRCS Conservation Innovation Grant
 Contact: David Primozych, Primozych @willamettepartnership.org

Ecosystem Credit Calculator Commenter's Checklist

| Documents | Date Available | Action Requested | Date Needed | Completed  |
|--|--|---|----------------------|---|
| General Crediting 1. General Crediting Protocol: Parts I-II 2. A Framework for Integrating Market Assurances 3. General Crediting Protocol: Parts III-IV | April 3 rd April 3 rd April 17 th | We ask commenter's to look at the overall structure of the protocol and whether the Table of Contents seems to capture the information relevant for the different users in the markets (buyers, sellers, third parties, and agencies). We ask that commenter's focus most of their attention on the recommendations housed within the assurances framework. | May 15 th | <input type="checkbox"/> |
| Water Quality | Shade-a-lator available on request | None on the credit calculation methods at this time. We ask water quality stakeholders to focus their comments on the proposed integrated package of assurances. There is no current documentation for nutrients/sediments. This will be created for the Tualatin by August 2009. Documentation for temperature can be found on the Willamette Partnership's website. | N/A | <input type="checkbox"/> |
| Prairie 1. Prairie Credit Calculator 2. Prairie Calculation Guidance 3. Discount factors and scoring | April 3 rd April 3 rd April 17 th | For these documents, we are seeking comments on indicator wording and answer choices and the factors determining the contextual value of the site. After April 17, we will be seeking additional comments on how indicators are rolled into a score for habitat function. | May 15 th | <input type="checkbox"/> |
| Salmonid 1. Salmon Currency Rules 2. Salmon Discounting Factors | April 3 rd April 17 th | The indicators and functions have been extensively vetted. We are asking for commenter's to focus on the weighting factors applied to functions to account for landscape context and the weighting ratios applied to credit estimates to account for risk. | May 15 th | <input type="checkbox"/> |
| Wetlands 1. ORWAP Calculator 2. ORWAP Manual 3. ORWAP Discounting Factor Scenarios | April 3 rd April 3 rd April 17 th | None before April 17. After April 17, we will be looking for comments on the discounting factors and approach for combining ORWAP scores with area to create credits. | May 15 th | <input type="checkbox"/> |
| Field Guide and Pilot Projects 1. Field Guide and Reference sheets 2. Datasheet for everything but wetland 3. Pilot Project summaries | April 3 rd April 3 rd April 3 rd | We ask commenter's to look at the overall structure of the protocol and whether the Table of Contents seems to capture the information relevant for the different users in the markets (buyers, sellers, third parties, and agencies). We ask that commenter's focus most of their attention on the recommendations housed within the assurances framework. | May 15 th | <input type="checkbox"/> |



Ecosystem Credit Calculator Protocol Development Status

V.1 03/31/09

| Process | Credit Type | | | |
|---|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| | Wetlands | Prairie | Salmonids | Water Temp |
| Define method framework | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Compile indicators of site functions | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Translate indicator measures into functional scores | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Test in the field for validity | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Revise based on comments | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Apply discount factors for context and risk | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Apply assurances | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Approve method | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |



Ecosystem Credit Calculator

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COMMENT DRAFT: Willamette General Crediting Protocol

Summary

The Ecosystem Credit Calculator's General Crediting Protocol will provide the overall framework and process for applying the Calculator. It describes why we think we need an integrated approach to credit calculation, and how a project turns from a good idea in a land manager's head into a portfolio of credit types they can sell. The general crediting protocol focuses on process and the currency-specific protocols focus on the credit calculation methods.

The most significant element of the general crediting protocol is an integrated package of assurances developed to make sure those credit estimates offered by sellers provide the ecological benefits they promise. The general crediting protocol is modeled from similar protocols used in carbon markets and from the Temperature Trading Handbook developed by the Willamette Partnership.

Current status and documents included

The general crediting protocol is very much a work in progress. It will evolve as elements of the credit calculation, assurances package, and other market elements develop. There are still major gaps in the protocol where the Working Group and Project Team have not been able to produce content. There are two documents, the protocol itself and recommendations for an integrated package of assurances.

1. General Crediting Protocol Introduction (GeneralCreditingProtocol_040309.doc)
2. A Framework for Integrating Market Assurances (Assurances 4-03-09.doc)



Action needed

We ask that commenters focus most of their attention on the recommendations housed within the assurances framework. We ask commenters to look at the overall crediting process described in the Introduction and whether the Table of Contents seems to capture the information relevant for the different users in the markets (buyers, sellers, third parties, and agencies).

Questions to guide comments

1. Do these assurances capture the most important categories? Is there anything major missing?
2. Which of these assurances do not represent significant value-added over existing practices?
3. Which of these assurances are the highest priority for you?

Submitting comments

Please submit comments by email to Joni Shaffer at jshaffer@willamettepartnership.org before May 15, 2009. Questions can be directed to Bobby Cochran at cochranb@cleanwaterservices.org or 503-681-4435. Thanks!



Ecosystem Credit Calculator

Willamette General Crediting Protocol

A product funded by an NRCS Conservation Innovation Grant

Table of Contents

PART I. INTRODUCTION 10

 I.1 Objectives and How to Use the General Protocol 10

 I.2 Background on the Willamette Partnership and Counting on the Environment program... 10

 I.3 Program Principles and Context 10

 I.4 Overview of the Debiting and Crediting Process 11

 I.6 Web-Based Debiting and Crediting..... 13

 I.7 Technical Assistance 13

 I.8 Training and Orientation 13

 I.9 Key Questions..... 13

PART II. PROJECT VALIDATION AND CREDIT/DEBIT CALCULATION 14

 2.1 Project Definition, Eligibility, & Validation..... **14**

 2.1.1 *Defining Your Project Boundary* 14

 2.1.2 *Supported Credit Types & Project Actions*..... 14

 2.1.3 *Determining Eligibility to Trade & Additionality*..... 16

 2.1.4 *Project Start Date and Crediting Period* 16

 2.1.6 *Example: Getting your Project Validated*..... 17

 2.2 Calculating Functional Ecosystem Scores **17**

 2.2.1 *Establishing Your Baseline* 17

 2.2.2 *Establishing Levels of Uplift or Impact* 18

 2.3 Converting Functional Scores to Debits and Credits..... **18**

 2.3.1 *Calculating Net Gains and Losses of Ecosystem Function* **Error! Bookmark not defined.**

 2.3.2 *Applying Discount Factors* **Error! Bookmark not defined.**

 2.3.3 *Reporting Formats for Credit and Debit Estimates*..... **Error! Bookmark not defined.**

[SECTIONS III-IV TO BE INCLUDED IN APRIL 17TH DOCUMENT RELEASE](#)

PART III. PROJECT REGISTRATION AND VERIFICATION.....

 3.1 Getting Started

 3.1.2 *Registration Summary and Fee Structures*

 3.1.3 *Opening a Registry Account*

 3.1.4 *Submitting Your Credit and Debit Report to the Registry*

 3.1.5 *Registry Guidance and Technical Assistance*

 3.1.6 *Accessing Your Project*.....

 3.2 Verification

 3.2.1 *Verification Principles and Process*

 3.2.2 *Professional Judgment*.....

- 3.2.3 Conflict of Interest
- 3.2.4 Reporting and Verification Deadlines
- 3.2.5 Regulatory Agency Role in Verification
- 3.2.6 Key Verification Steps.....
- 3.2.7 Preparing for Verification
- 3.2.8 The Verification Cycle
- 3.2.9 Assigning a Verifier
- 3.2.10 Accreditation of Verification Bodies.....
- 3.2.11 Online Reporting.....
- 3.2.12 Documentation for Review.....
- 3.2.13 Batch Verification
- 3.2.14 Verification Report and Opinion
- 3.2.15 Submitting a Verified Emissions Report to the Registry.....
- 3.2.16 Agency Certification of Verification Report and Opinion.....
- 3.2.17 Record Keeping and Retention
- 3.2.18 Publicly Available Information.....
- 3.2.19 Correcting or Revising Your Credit and Debit Report.....
- 3.2.20 Dispute Resolution.....
- 3.2.21 Key Verification Questions
- 3.3 Credit Sale & Transfer.....
- 3.3.1 Credit Issuance and Listing
- 3.3.2 Transfer.....
- 3.3.3 Retirement.....
- 3.3.4 Transferring Projects Into orFrom the Ecosystem Credit Registry and Another Registry

PART IV. SECTOR PROTOCOL DEVELOPMENT PROCESS.....

- 4.1 Screening Process and Scoping

General Debiting and Crediting Protocol

Part I Introduction 1

1.1 Objectives and How to Use the General Protocol

The Willamette Basin General Crediting Protocol (Protocol) provides market participants (managers, buyers, sellers, and third parties) with the overall framework they need to develop, sell, and buy ecosystem credits in the Willamette River Basin. The information contained in the Protocol was developed under a grant from the USDA Natural Resources Conservation Service and with the guidance of a stakeholder working group. This group is composed of federal, state, and local governments, conservation organizations, potential credit buyers, and potential credit sellers. The Protocol is designed as a general reference guide for activity in the Willamette Marketplace. More detailed protocol documents are available for each credit type supported in the Marketplace. The Protocol is a product of several years' worth of foundational work conducted by hundreds of parties and one year of intense work conducted by the stakeholder Working Group. It describes "Version 1" of an Integrated Ecosystem Accounting System. Version 1 will be updated and adaptively managed as it gets applied. New ecosystem service protocols will be added to it, existing ones will change, and the package will be expanded to new geographies.

1.2 Background on the Willamette Partnership and Counting on the Environment Program

Emerging markets for ecosystem services will connect people in new ways. Markets such as these provide land managers with a new suite of options when it comes to generating profits from their land. Improved water quality, better wetland habitat, increased habitat for fish, and higher quality upland areas represent some of the "products" land managers will soon be able to produce and sell through ecosystem service markets. These markets also provide anyone impacting the environment with viable alternatives for making-up for it—alternatives that meet regulatory standards, reduce costs and fortify natural resources.

The Willamette Partnership formed in 2004 as 501c3 non-profit coalition whose mission is to expand the pace, scope, and effectiveness of restoration. Establishing a marketplace for ecosystem services is a major part of the Partnership's work.

1.3 Program Principles and Context

The Willamette Basin in Northwestern Oregon unfolds between the volcanic cones of the Cascade Range to the East and the forested Coast Range Mountains to the West. Over the last 150 years, the Basin has amassed a large human population and a diversified industrial economy anchored by the Portland Metropolitan Area to the North and the Eugene and Springfield Metropolitan Area to the South.

Amidst all of the Basin's natural amenities and human development, the Willamette River and its tributaries drains enough water to make it the 13th largest river in the lower 48 states. The entire Willamette River Basin includes a land area of around 11,500 square miles, a population of

around 2.5 million and around 75 percent of Oregon's economic activity. This economic activity produces substantial impacts to the environment. All expectations are for the human presence to grow substantially over the next 30 years, along with the impacts such a presence carries with it.

There are several pieces in place to minimize and reduce these impacts (e.g. established prescriptive environmental polices, wetland mitigation banking and species conservation banking), but they do not always work in synergy. The Partnership's work, including the Protocol, is based on the assumption that ecosystem markets should be tied to meeting overall environmental goals rather than just strict interpretations of current rules and program guidelines. As such, the Willamette Marketplace constantly strives to:

1. Produce the highest quality restoration and conservation where it makes the greatest ecological difference
2. Foster transparency, accountability, and credibility in emerging ecosystem markets
3. Facilitate the connections among buyers and sellers that put the greatest amount of resources into real benefits with the least amount of transaction costs

I.4 Overview of the Debiting and Crediting Process

PROJECT DEVELOPERS

The following steps outline the process a land manager would follow to generate, register and sell ecosystem service credits based off of a restoration project.

1. **Site Selection and Validation.** A seller selects a potential site to conduct restoration activities, and works with an approved validator to determine the project's baseline conditions and eligibility.
2. **Initial Credit Calculation.** With a basic understanding of the site's location and the site's potential to generate ecosystem service credits, sellers may then choose to carry on with a more in-depth analysis of the site to determine the exact type and number of credits it can produce using marketplace tools.
3. **Conditional Credit Registration.** Up to this point, potential sellers have evaluated a site's potential to produce ecosystem service credits and conducted the restoration work needed to make them a reality. They now need to open a seller's account on the registry, a step that begins the formal third-party process through which credits will be assessed and approved for entry into the market.
4. **Credit Verification.** It is expected that those interested in generating ecosystem service credits will be acting in good faith. However, to provide assurance to regulators and to the public, all conditionally-accepted credit registrations will undergo independent verification by professionals approved by the market administrator. This process confirms calculations done by (or for) the seller and confirms the work done on the ground.
5. **Credit Issuance.** Certified credits are the only credits available for sale on the Credit Registry. The process through which credits go from conditionally-certified to certified is called the

issuance process. Issuance happens only after verification occurs, the Registry receives a verification report from the verifier and the seller approves of it.

6. **Selling and Transferring Credits.** The actual sale of credits is a straightforward process that mainly involves the seller and buyer. The Registry and the market's administrator will not be involved with any financial transaction between buyers and sellers. The Registry simply receives a report after a transaction is made and moves credits from one account to another.

7. **Track the Credits.** Sellers will need to conduct annual verifications of all credits they develop until the credits are sold. The failure to verify credits will result in their removal from the Registry. Sellers will use the same verifier for the first five years.

BUYERS

The buyers of ecosystem service credits include any public or private entity with a regulatory obligation to reduce the impact of their development actions. Buyers might also include any entity interested in purchasing a credit to retire, use or resell. The process for these buyers to purchase credits demands interaction with many parties and a commitment to the long-term monitoring of restoration projects associated with purchased credits.

1. **Permit Allowance/Validation.** The potential buyers of ecosystem service credits must first receive formal approval from the necessary regulatory agencies to achieve partial or full compliance with their permit requirements through trading credits.

2. **Credit Calculation.** The number of credits a potential buyer is required to purchase depends on the impact that their development action creates. For development actions covered by Version 1 of the Ecosystem Credit Calculator, the process of determining these ecosystem debits follows the same calculation, registration, and verification process that ecosystem credits do.

3. **Set up a Buyer's Account.** Buyers must fill-out a buyer's registration form and submit it to the Registry. Buyers will pay an account origination fee to help defer the costs of managing the Registry. This step publicizes a buyer's intent to purchase credits in the marketplace.

4. **Negotiate and Finalize a Credit Purchase.** The Registry does not set the price of the credits listed, nor does it set the terms and conditions of sales. The price, terms and conditions are all set and agreed upon by the seller and buyer—with the only exception being the monitoring requirements associated with final and ongoing certification.

5. **Annual Monitoring Reports.** The natural landscape is dynamic, requiring the ongoing monitoring of restoration sites to make sure that they continue to provide the ecosystem services credits they were designed to. Sellers will pay verifiers to conduct a full verification of the entire credit calculation process, which is likely to include a site visit, in years one and five of a credit's life. A verifier will also conduct desk audits in years two, three and four. In every instance, the verifier will be selected through a standard process managed by the Registry and paid for by the seller. Sellers are responsible for submitting annual monitoring reports to the Registry, buyer and necessary regulatory agencies.

For a more detailed outline of the credit generation and credit purchase processes, please proceed to Appendix A.

I.6 Web-Based Debiting and Crediting

Version 1 of the Ecosystem Credit Calculator is automated whenever possible. This automation occurs through the use of web-based applications that seamlessly transfer data entered by land managers and those seeking to purchase ecosystem services credits.

The buyers and sellers of credits will most likely interact with three major web-based tools supported by the marketplace: a user interface or market portal that provides public information, direction to participants and a centralized hub for the rest of the market's tools to connect with; a credit calculator that uses data submitted by buyers and sellers to calculate credits and debits; and a registry that performs the credit and debit tracking functions needed to ensure the transparency and legitimacy of the marketplace.

The level of automation, and therefore the overall efficiency of the marketplace, is expected to increase over time.

I.7 Technical Assistance

The market administrator will provide technical assistance to buyers, sellers and regulators encountering difficulties with the use of Version 1 of the Ecosystem Credit Calculator.

I.8 Training and Orientation

Despite automation, and effort to create a practical system that various parties with different types of expertise can use, Version 1 of the Ecosystem Credit Calculator will require that market participants go through some level of training and orientation prior to using it. Web-based training modules will be incorporated into all the major tools associated with Version 1. Training classes, organized by the market administrator, will also be scheduled on demand to accommodate new users of the system.

I.9 Key Questions

Q: Is Version 1 of the Ecosystem Credit Calculator designed for a specific type of user?

A: The Willamette Partnership designed Version 1 to be used by individuals that already possess some specialized training. Targeted users include trained watershed professionals from private consultancies, Soil and Water Conservation Districts and other public or non-profit organizations.

Q: Why does Version 1 calculate unregulated ecosystem services?

A: Version 1 represents a compromise between ecosystem services for which there is already demand, ecosystem services for which demand may soon emerge and ecosystem services that allow for a more comprehensive approach to restoring the entire landscape. This also allows for the voluntary purchase of unregulated credits.

Q: How many different credit types will there be?

Version 1 will support four primary credit types, but as time goes on and more credit protocols are developed and there is demand for other ecosystem services, the Ecosystem Credit Calculator will include new credit types.

Part II Project Validation and Credit/Debit Calculation

2.1 Project Definition, Eligibility, & Validation

2.1.1 Defining Your Project Boundary

Land managers make two types of essential geographic determinations when using the Ecosystem Credit Calculator. The first determination sets the location of the entire area from which the land manager will seek to generate credits (the project boundary).

The second type of determination a land manager makes sets the locations of map units within the project boundary. These map units are based upon the type of credits that a land manager expects to generate and denote that a homogenous resource type is present within their boundaries. A map unit is a section of a property delineated by common habitat type, habitat structure, and habitat elements. These boundaries are first set through the interpretation of aerial photos and then confirmed or adjusted on the ground. A single project site will have as many map units (polygons) as it has diversity in habitat types. By using this map unit approach, the Calculator will be able to calculate multiple credit types on project sites with multiple habitat types. Each map unit will ultimately be dedicated to the production of one of the credit types listed below.

Developers that are assessing the size and scope of their impact will also determine project and map unit boundaries for their initial impact calculations.

2.1.2 Supported Credit Types & Project Actions

The Ecosystem Credit Calculator currently supports a subset of ecosystem credit types and actions that create benefits and impacts. Credit types and their tradable units include:

- Wetland (functional acre)
- Salmonid habitat (functional linear foot)
- Upland prairie habitat (functional acre)
- Water quality: Temperature (kcal/day)

Initial credit type selection was based on market demand and available assessment methods.

Near-term priorities for additional credit-type development include:

- Water quality: Nitrogen, Phosphorus, and Sediment (lbs/yr) [Available in Tualatin River]
- Generalized stream habitat (functional linear foot)
- Carbon (metric ton of CO₂ equivalent)
- Generalized rare habitat (functional acre)

Each of the credit types above may be generated by conducting different types of restoration actions. Over time the Ecosystem Service Calculator shall include more types of credit generating actions. Approved action types are listed in Table 2a.

Table 2a: Version 1 Eligible Conservation Actions by Target Currency (See detailed list of actions in Appendix C)

| | Conservation Actions | |
|--------------------------------------|--|--|
| Target Currency | Version 1 actions | Near-term priorities |
| Water Quality-Temperature | Plant native vegetation | Flow augmentation Floodplain restoration |
| Wetland Habitat | Improve function of an existing wetland | Protect existing wetland |
| | Restore and create wetland hydrology | |
| Salmonid Habitat | Plant native vegetation | Protect existing habitat |
| | Improve In-stream fish habitat: Large wood placement | Restore channel geomorphology: side channels, remeanders, etc... |
| | Improve fish passage: Culvert removal | |
| | Manage sediment inputs: Add fencing | |
| Prairie Habitat | Improve function of an existing prairie | |
| | Restore prairie functions | |
| | Protect existing prairie | |
| Water Quality-Nitrogen & Phosphorous | Crop cover | |
| | Fertilizer use | |
| | Irrigation type | |
| | Manage sediment | |
| | Plant native vegetation | |

Just as there is an approved suite of credit-generation actions, an approved suite of development actions also exists. This set of approved impact-actions may also be expanded in the future (Table 2b).

Table 2b: Version 1 Eligible Development Actions by Target Currency

| Target Currency | Development Actions |
|---------------------------------------|---|
| Water Quality- Temperature | N/A |
| Wetland Habitat | Altered vegetation |
| | Altered hydrology |
| Salmonid Habitat | Altered vegetation |
| | Altered hydrology |
| | Contaminants |
| | Natural system modifications |
| Prairie Habitat | Altered fire |
| | Altered vegetation |
| Water Quality- Nitrogen & Phosphorous | Change crops, fertilizer, or irrigation |
| | Altered vegetation |
| | Contaminants |

2.1.3 Determining Eligibility to Trade & Additionality

Eligibility criteria determine who can buy credits, who can sell them and who can trade them with whom. They are designed to keep out overly-risky or inappropriate projects. For example, before conducting a restoration action and generating credits at a site, land managers must first establish the baseline conditions of the proposed site. This provides a reference for measuring additional benefits but also ensures the site complies with existing regulations and has not been degraded recently. Alternatively, for potential buyers like wastewater treatment plants, they must meet baseline standards for technology before they can trade to meet permitted allowances.

All credited projects need to demonstrate they provide “additional” conservation benefits. The additionality requirement ensures that credits are awarded for doing more than what would otherwise have happened without a market. All credits need to result from restoration actions that are: 1) above and beyond a regulatory threshold for compliance, and 2) above and beyond business as usual.

Not all projects will be eligible to enter the Marketplace. Both buyers and sellers will need to meet some minimum standards for reducing impacts and ensuring credit quality.

2.1.4 Project Start Date and Crediting Period

In general, the start date for a project will correspond to the start of the activity that generates environmental benefits or impacts. Specific requirements for determining the start date of a project are contained in each credit-specific protocol. The crediting period, sometimes called the “life of the credit”, is the period where conservation actions are eligible to receive credits. The crediting period differs by credit type and specifics can be found in each credit protocol. For

example, a wetland credit period is perpetual, a nutrient credit is annual, and a riparian shade temperature credit is good for 20 years.

2.1.5 Receiving a Notice of Validation from the Registry

The first step in entering the Marketplace is getting your project validated. Validation is an optional step for buyers to help determine which credit they might be eligible to buy. Validation is mandatory for sellers. It provides them with an idea of which credits they will be eligible to sell, some technical commentary on project design, and an estimate of how many credits they can expect to receive. The Marketplace's administrator maintains a list of approved validators, who are often the same people accredited to verify credit estimates later in the process. A project developer can choose any validator they want. The validator will help the project developer open an account on the Registry and submit a validation opinion. Validators are also free to provide technical advice on project designs. Generally, if this opinion is complete, it will be automatically accepted by the Registry, but acceptance may differ by credit type. Please review the credit protocols for specifics. Validation is a statement by the Registry to the project developer that they have met eligibility requirements. It is not a confirmation on the quantity of credits issued.

2.1.6 Example: Getting Your Project Validated

WILL BE INSERTED LATER.

2.2 Calculating Functional Ecosystem Scores

Once a project developer has delineated the project boundary, come up with a restoration design, and determined their project eligibility, they are ready to begin calculating credits.

2.2.1 Establishing Your Baseline

The first step is establishing baseline ecosystem functions. The baseline defines the current condition from which a conservation action improves function or a development action impacts ecosystems.

Baseline data collection occurs in two phases. The first phase occurs one in the office through the collection of spatial data and information from existing databases. Sources include aerial photos (surrounding land cover), topography, NRCS web soil survey, Oregon Explorer (species occurrences), DEQ (water quality issues), PRISM Data Explorer (precipitation), and the T-Tools extension (for temperature factors).

The second baseline data collection phase, field data collection, confirms the map unit boundaries defined in the office during validation. As map unit boundaries are confirmed, the field team assigns them unique identifiers and collects data for each map unit within the project boundary.

Data is collected on general location, habitat type, and a variety of performance indicators that are associated with structural conditions and also individual habitat elements. Additionally several "Yes/No" questions are also completed. These questions are used within the database to

trigger certain functional calculations, and also to establish the relationships existing between adjacent map units for calculations within the database. Additionally, if present, information relating to existing restoration efforts or opportunities, current management activities, and observations on wildlife activities will also be noted. The datasheet is designed so that data collected for each map unit is comparable from map unit to map unit and from property to property. The datasheet is also designed to allow for the field surveyor to check the information pertinent to each map unit. Finally, the datasheet is also designed so that the data gathered starts at the general level and then moves to the specific. This was done to help in determining if a map unit boundary has been placed incorrectly.

Upon completion of the field inventory, the data from the datasheets is transferred to the Calculator database. Like the datasheet, the majority of the data is entered through the use of check boxes. In a few instances actual numeric or text data is required to be entered, but these will be formatted within the Calculator database to only accept the correct type of data. The field maps are also reviewed and any changes or additions to the map unit boundaries are digitized to match field conditions.

2.2.2 Establishing Levels of Uplift or Impact

Planned conditions must be compared to existing ones to reach the final credit or debit calculation at a site undergoing restoration or development. Restoration and development designs are therefore needed to calculate the ecosystem change from a baseline to a future condition. The more complete these designs are, the more accurate the calculation of ecosystem change will be.

From these designs, a second set of data is created in the office, based on the management activities that are planned or have been implemented on a site. Essentially, answers to the field survey forms are projects based on these planned conditions. The initial field inventory is completed to establish a current or baseline condition. A second set of map units is created where the implementation of the management activities will have changed the shape or size of the baseline map units. This potential future dataset is also entered into the Calculator database. The final step of data entry is to calculate the area of each map unit for baseline and potential future conditions. This is done within a GIS platform using the XTools extension. This area (in acres) is then transferred to the database. Queries within the database calculate the project area for both baseline and future conditions.

2.3 Converting Functional Scores to Debits and Credits

WILL BE COMPLETED IN MORE DETAIL LATER.

2.3.1 Calculating Net Gains and Losses of Ecosystem Function

After future ecosystem functions are projected, the Credit Calculator simply subtracts baseline condition from future condition to get a measure of ecosystem change by individual or overall function.

2.3.2 Applying Discount Factors

Counting on the Environment's credit/debit calculation system applies weighting ratios to the scoring of ecological functions in order to incorporate the *contextual value* of a site. Ratios are used as incentives for good work and restoration in priority areas. Likewise, applying ratios will provide a disincentive to impacting high priority functions in high priority areas.

The scoring of each ecological function reflects how indicators combine to provide that function on a purely scientific basis. These functions are not sensitive to the context of how the watershed itself and the public benefits from them. Thus functional scores require modification in order to represent their value to society and the broader landscape. For example, a site may score high for its water storage and delay function, but that score must be weighted by the site's opportunity to perform that function and the watershed's relative need for that function.

Weighting ratios in this calculation system can be placed at the function level or at the credit/debit level. The application of ratios at the function level addresses the fundamental mitigation goal of replacing functional performance. Applying weights at the function level also provides a transparency to choices about which functions will receive priority. It provides incentives to address limiting factors with restoration and to minimize or avoid impacts to those functions most important to all of us. (Weights at the indicator level would not necessarily prioritize functions, because indicators appear in multiple functions.)

Weighting ratios applied at the credit/debit level have a much greater influence on the amount of credits/debits that are generated. This application of weighting ratios will direct restoration to priority regions and redirect impacts to sites less critical to the watershed.

The following section use salmonid credits as an example. Weighting factors are under development for prairie and wetland credits. Numerous plans have already been completed for salmonid recovery in the basin which identify limiting factors that must be addressed for the successful recovery of the species. Weighting factors can help push restoration toward the actions that have the greatest ecological benefit, but taken too far they can make a project so costly it never gets done. The challenge is applying these weighting ratios in an objective and consistent way so we get wise mitigation and impact decisions via a predictable process for issuing credits and debits.

Weighting factors for salmon will be based on criteria tied to limiting factors and priority populations in the Willamette Basin. Limiting factors are drawn from the Oregon Dept. of Transportation's Comprehensive Mitigation and Conservation Strategy program, which uses work completed by The Technical Recovery Teams (TRT), National Marine Fisheries and Oregon Dept. of Fish and Wildlife. Some of these threats are not issues that the accounting system can immediately address – e.g., hydroelectric and flood control dams. The draft recovery plan identifies limiting factors and threats that provide a basis for applying weighting ratios.¹ The high priority limiting factors and their links to functional categories are listed below.

¹ Oregon Department of Fish and Wildlife. 2007. Draft Upper Willamette Domain Recovery Plan. Chapter 6, Limiting Factors and Threats to Recovery.

| Threat | Function | Priority |
|--|------------------------|-----------------|
| Land Use: Elevated Water Temperatures | Temperature Regulation | High |
| Land Use: Impaired Physical Habitat (Large wood, channelization, gravels, etc.) | Habitat Formation | High |
| Land Use: Loss of Holding Pools | Habitat Formation | High |
| Hydropower: Low Flows and Reduced Channel Complexity | Channel Diversity | High |
| Hydropower: Low Peak Flows and Reduced Macrodetrital Inputs | Anadromous Support | High |



DISCUSSION DRAFT: A Framework for Integrating Market Assurances

April 3, 2009

I. Introduction

In spite of the best available science, we still can't predict with air tight precision how ecosystems will respond to actions taken by people restoring and developing natural resources. As a result, every type of ecosystem market includes a package of, what is commonly called, assurances. Assurances seek to guarantee the environmental restoration actions completed to offset the impacts of development actually deliver the benefits that they are designed to. Assurances also work to provide process certainty to buyers and sellers in markets. The framework presented below proposes a package of assurances that might be used across many market types. It was developed based on existing market rules, their overlaps and the identification of gaps that could be filled by common approaches.

The framework makes some detailed recommendations drawn from existing rules and practices in wetland mitigation banking, water quality trading, and voluntary carbon markets. Some of the recommendations are hybrids of these and others are newer ideas. We have done our best to document the problem the recommendation is designed to address, the source of the recommendation, and the rationale for choosing it. The recommendations are designed to be as explicit as possible to provoke discussion. In no way are they set in stone, but we are confident they represent a package that will ensure markets produce the environmental benefits they promise. Some of these assurances can be implemented immediately, some will need rulemaking or other administrative action, and some will need further review and evaluation.

Table 1 on the follow page ties the credit issuance process to assurance types and the recommendations presented in this document.

REQUEST FOR COMMENTS

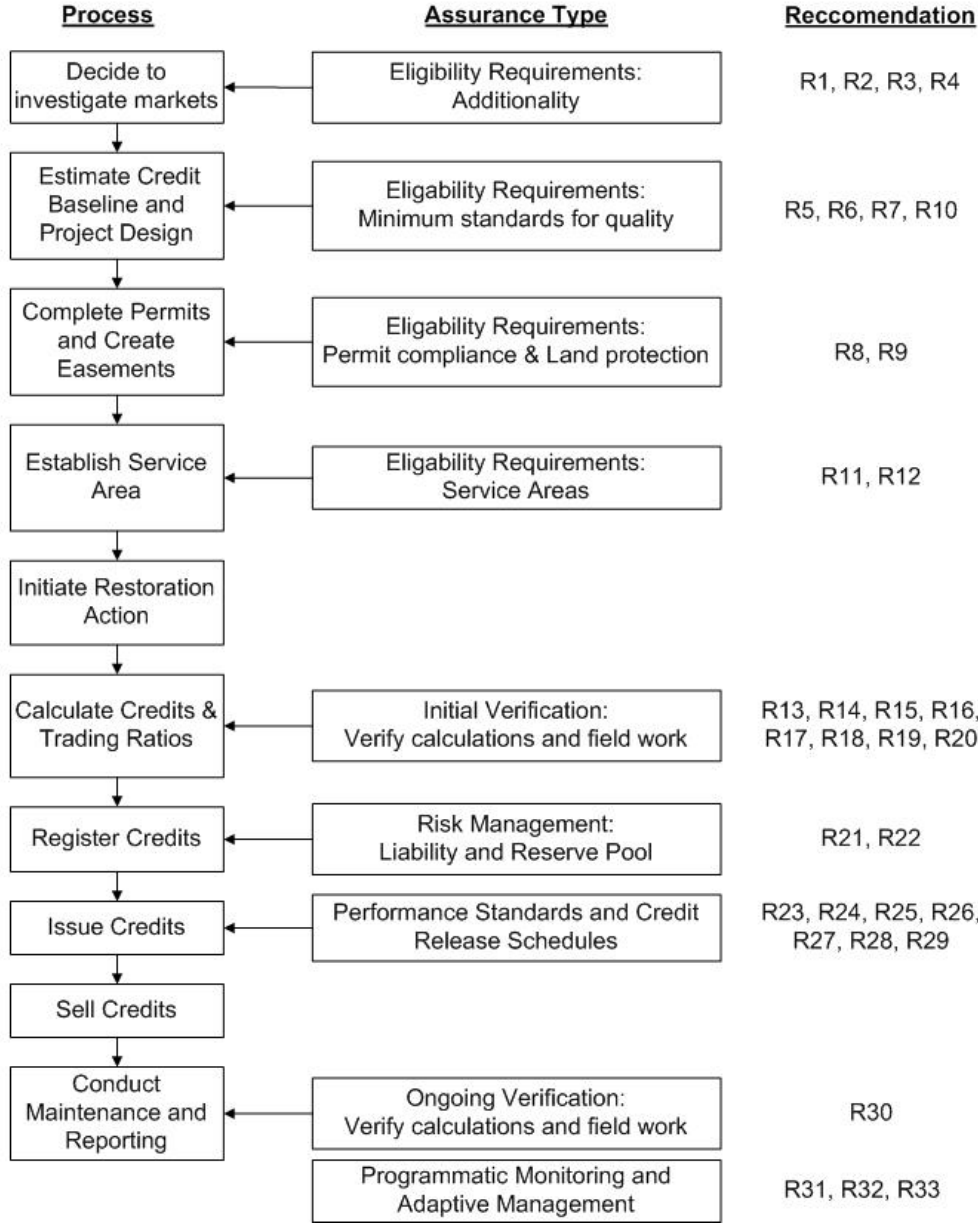
These recommendations are preliminary and meant to spark discussion. We are looking for comments from anyone related to the clarity, sensibility, timing, feasibility, and other characteristics of both the specific recommendations and the characterization of the overall assurances package.

Please submit comments to Joni Shaffer at jshaffer@willamettepartnership.org by May 15, 2009. Questions on the document or recommendations can be directed to Bobby Cochran at 503-681-4435 or cochranb@cleanwaterservices.org.



Assurances: Credit Generation and Sale Counting on the Environment

V.1 03/31/09



II. Background

Uncertainty may be inherent in ecosystem markets. But it can be managed. Uncertainty stems from a lack of knowledge (or inability to assign meaning to that knowledge) and generally comes in three forms: substantive, strategic, and regulatory (Hosterman 2008). Substantive uncertainty comes from the dynamic character of ecosystems. Floods deposit and scour soil, fires destroy some habitats and create new ones, and invasive species upset the ecological equilibrium. All of these forces alter, sometimes radically, existing natural conditions—and there is not much people can do to control them. Next, strategic uncertainty stems from the new relationships formed among ecosystem market participants. Many landowners may not be willing to participate in markets, thereby reducing the supply of such services. On the other hand, industrial buyers may go bankrupt, thereby reducing demand. In either case, formerly isolated groups will be affected by each other’s choices and condition. Lastly, regulatory uncertainty is generated by the flux or opaqueness of government policies and market rules. What is required by the producers and buyers of ecosystem services today may not be required tomorrow, making planning difficult. Together, these three forms of uncertainty raise questions about whether a restoration project will perform its intended functions, who is liable if it does not, and how the marketplace will account for their success or failure. Just as it is possible to articulate the sources of uncertainty in ecosystem markets, it is also possible to articulate and estimate the relative quantity of these uncertainties. In this paper, quantified uncertainty is called risk.

In 2008, Heather Hosterman, working with The Nature Conservancy, captured some ideas on assurances for the Practitioner’s Working Group of the Willamette Partnership. Many of the ideas in this paper are taken from her final report to the Willamette Partnership. The Working Group identified several risk factors that, if managed well, will lead to more successful credit projects or transactions. These are detailed in Table 2.1 below.

Table 2.1: Environmental Market Risk Factors

| Risk Factor | Description |
|--|---|
| Quality of the original site (locally and for broader landscape) | If a site and its adjacent land cover meets a certain set of criteria (e.g. low invasive cover, adjacent to natural lands, located in a priority, etc...), it is more likely to produce lasting ecological value. |
| Suitability of the restoration design | If a site is restored to historic or reference conditions, it is more likely to reach its site system potential. |
| Qualifications of the land-manager and/or restoration practitioner | If a manager or practitioner has experience, capacity, and a restoration mission, they are more likely to deliver a successful restoration project. |
| Timing of credits related to impacts | Credits created after an impact has occurred increase temporal loss of function and create a risk that functions lost may not be replaced if the restoration does not perform as planned. Credits released before performance standards |

| | |
|--|---|
| | are reached increase the risk that the project may never meet these standards. |
| Known effectiveness of development and conservation action | The response of ecosystems to some human actions is much better understood than others. Wetland restoration generates more predictably measurable benefits than wetland creation. |
| Long-term management (plan, person, and funds) | Sites that are protected with long-term leases or easements, have money set aside for management and have someone in charge of them are more likely to sustain their benefits. |

III. Responses to Risk

Markets use a variety of assurance tools to address sources of uncertainty and the risk factors described above. These tools include:

- Eligibility criteria for the impacts and benefits that are creditable and the trades that are appropriate;
- Verification rules for monitoring conditions on the site in relation to performance
- Liability, trading ratios, and other forms of risk-management;
- Performance standards and credit release schedules; and
- Programmatic monitoring and adaptive management.

The sections below describe each of these assurance tools in more detail.

3.1. Eligibility Requirements

Eligibility criteria determine who can buy credits, who can sell them and who can trade them with whom. They are also designed to keep out overly-risky or inappropriate projects. In many markets, eligibility is determined by a process called “validation”. For example, before conducting a restoration action and generating credits at a site, land managers must first establish the baseline conditions of the proposed site. This provides a reference for measuring additional benefits but also ensures the site complies with existing regulations and has not been degraded recently. Alternatively, for potential buyers like wastewater treatment plants, they must meet baseline standards for technology before they can trade to meet permitted allowances. For agencies and market managers, they can document that buyers have completed their obligation to avoid and minimize impacts.

Service areas (also called trading areas in some markets) are another type of eligibility requirement. In wetlands markets, buyers and sellers must come from the same watershed (e.g. the 4th field hydrologic unit). In current wetland and water quality markets, trading between different watersheds is generally prohibited in order to keep impacts and restoration actions relevant to one another. This may be different for species that cross watershed boundaries. Projects may also set minimum design qualifications as a type of eligibility requirement. For example, projects need appropriate restoration designs that include target species, habitat elements, and diversity. Wetland banks may need a conservation easement. Restoration design may need to be targeted toward a reference site, historic conditions or some theorized optimum condition.

Eligibility criteria have pros and cons. Stricter eligibility criteria generally lead to fewer projects that will actually be able to enter the market. However, the ones that do enter have a better chance of succeeding.

3.2. Verification Rules

Credits traded in a marketplace only have value if participants – buyer, regulators, sellers, and the public – know sites are achieving required performance standards. They seek, in other words, verification. Verification can take on many forms. It can be conducted by agency staff, independent third-parties or by the buyers and sellers themselves. In wetland banking, verification occurs in two ways: by sellers submitting monitoring reports and by agencies conducting annual site visits to confirm those reports. In carbon markets, independent third parties conduct verification on behalf of buyers and sellers. In many water quality markets, buyers are responsible for verifying the credits they buy.

Verification answers two general questions. Are project developers complying with market rules and procedures? Is the site achieving performance standards established by the market? Verification can be conducted on an intensive annual basis, or in cycles of single-party check-ins punctuated with full-verification by an agency at a less frequent interval. Verification may also vary in the type of information that is evaluated. Sometimes verifiers check to make sure decisions and credit estimates are well-documented, other times they may re-run credit or debit calculations to see if modifications to credit calculations need to occur based on performance. Another important element of verification is a clear dispute resolution clause in case verifiers and buyers or sellers cannot agree on credit estimates. The advantage of formal verification is a predictable process that takes buyers and sellers from a credit estimate to documentation that regulatory requirements are met and key issues are decided.

Once credits have been verified, they may also go through a process of credit issuance. Generally, issuing credits is an office task of ensuring all the paper work, documentation and rules are in place. For regulated markets, agencies are the entities that issue credits even if a registry assigns serial numbers for tracking and accounting purposes.

3.3. Risk Management

This catch-all category covers liability rules, trading ratios and other tools markets use to manage risk. In many markets (wetland mitigation banking, species and carbon for instance) permit liability for the performance of credits lies with the seller. In water quality trading and permittee-sponsored wetland mitigation, permit liability remains with the buyer. Generally, liability is a costly proposition. It causes water-quality buyers to hesitate when buying credits and it causes higher prices for many sellers in habitat mitigation markets. For agencies, the question of permit liability is critical. Permits are their mechanism for enforcement, so markets must make it clear where liability lies. Given the expenses associated with liability, some markets have generated ways to share it. For example, a trade association in the North Carolina's Neuse River accepts liability on behalf of a set of water quality buyers.

Trading ratios are another common way to deal with uncertainty and risk. Trading ratios are designed to account for many things, including: the likelihood a project itself will fail, the time it

takes for an action to deliver the benefits it promises, a safety factor for environmental benefit, and the contextual value of a credit in relation to a debit. Trading ratios might also be used to provide incentives for desired actions, investment in priority locations or other environmentally-beneficial actions not captured directly in the debit or credit estimation. For the Counting on the Environment program, trading ratios are included as part of the credit calculation metrics and not a part of the assurances framework.

Markets use other forms of risk management as well. Sometimes wetland bankers are required to purchase performance bonds during construction. The Great Miami program in Ohio established a reserve pool of credits to act as insurance against some of its projects failing. In carbon, the Voluntary Carbon Standard Association requires the retention of “buffer” credits to create a reserve. In both of these cases, project sponsors can only actually sell a portion of the credits their projects generate.

3.4. Performance Standards and Credit Release Schedules

Many markets phase their release of credits over time based on achievement of pre-defined performance standards. Doing this accounts for the fact that the exact benefits of a restoration project are often difficult to predict prior to initiating the work of restoration. In addition, the benefits of restoration typically accumulate over time with active management. The performance standards associated with phased credit releases might include the following: a maximum percent cover of invasive species, a target level for depth to saturation in wetlands, the presence of target species or the implementation of planned practices.

3.5. Programmatic Monitoring and Adaptive Management

There is very little systematic evaluation of most ecosystem markets. Largely, these markets are new and represent a small fraction of the total conservation or development activity in a region. That said, programmatic monitoring and a defined adaptive management plan can go a long way toward mitigating risk. There needs to be a process for rolling verification and site-level monitoring reports into a programmatic picture linked to landscape-level monitoring that includes a full suite of conservation actions and continued impacts.

There also needs to be a predictable schedule and process for updating credit calculation methodologies and market rules to respond to lessons and feedback generated by market activity and new science. These feedback loops that are transparent and fixed for some period of time allow people to take initial actions to learn. But they also adapt in a predictable way, allowing planners to make significant investments with a higher degree of certainty on what their return on investment will be.

IV. Recommendations for an Integrated Assurances Package

The following recommendations are taken from a variety of sources including existing rules and practices in wetland mitigation banking, water quality trading, and voluntary carbon markets. Some of the recommendations are hybrids of these and others are newer ideas. We have done our best to document the problem the recommendation is designed to address, the source of the recommendation, and the rationale for choosing it. The recommendations are designed to be as explicit as possible to provoke discussion. In no way are they set in stone, but we are confident they represent a package that will ensure markets produce the environmental benefits they promise. Some of these assurances can be implemented immediately, some will need rulemaking or other administrative action, and some will need further review and evaluation.

4.1. Eligibility Criteria

As a type of assurance in markets for ecosystem services, eligibility criteria apply to sellers, buyers and to the trades themselves. Eligibility criteria, as noted earlier, serve as minimum standards designed to keep out inappropriate projects or trades. Setting the height of these standards is likely to be an iterative process, reflecting conservation objectives and market conditions. In new markets, a significant amount of time is spent between project developers and agencies. Eligibility criteria can help ensure time is spent on the projects with the highest likelihood of success and avoid conflicts tied to inappropriate projects or trades.

4.1.1 Additionality

All credited projects need to demonstrate they provide “additional” conservation benefits. The additionality requirement ensures credits are awarded for doing more than what would otherwise have happened without a market mechanism in place. Recommendation R.1 borrows from the additionality requirements in carbon markets, and particularly from The Climate Trust guidance based on the Kyoto Protocol and WRI guidance (http://www.climatetrust.org/solicitations_2007_Additionality.php).

R.1: All issued credits result from restoration actions that are 1) above and beyond a regulatory threshold for compliance, and 2) above and beyond business as usual. Defining “business as usual” will be based on a set of questions answered by the landowner during the project validation process.

Many existing markets are focused on restoration and do not provide strong incentives for preserving high quality habitat. In this situation, eligibility requirements can also be used to guard against an incentive to destroy good habitat just to later restore it for credit. The balance lies in providing room for new landowners who want to reverse actions of past landowners to get credit for their actions. Recommendation R.2 is based on The Climate Action Reserve’s forest carbon offset protocol for reforestation projects (<http://www.climateregistry.org/tools/protocols/project-protocols/forests.html>), which states that lands cannot have been subject to intentional, significant disturbance from the landowner in the

last 10 years. Recommendation R.3 is based on the 1985 Food Security Act requirements, and Recommendation R.4 allows new landowners, land trusts, and others to reverse actions taken by previous landowners.

R.2.: Require that all credits result only from restoration actions that occur a minimum of 10 years after a significant, intentional development action on the site. For example, a landowner would be ineligible to sell credits for restoring riparian forest if they had removed any portion of a pre-existing riparian forest in the last 10 years.

R.3.:For wetland projects, any restoration action occurring on prior converted or farmed wetland according to the 1985 Food Security Act are eligible for credits. If a wetland has been converted in the last 10 years, it is not eligible. Standard agricultural and forest practices occurring on wetlands would not necessarily preclude credit eligibility.

R.4. If land changes hands from the landowner conducting the development action to a new land owner conducting the restoration action, the second landowner would be eligible to sell credits.

Comment [c1]: This is meant to allow someone with a conservation interest (e.g. land trust or banker) to acquire a degraded parcel and turn it around. As written, it does not protect against transfers to a cousin or LLC.

4.1.2 Minimum quality standards

Creditable projects also need to meet a minimum standard of quality. The time and investments required to create, verify, and register credits is significant. Quality standards help save people time and money by ensuring good site selection and project design. Recommendations R.5-R.7 are based on riparian restoration goals in the Dept. of Environmental Quality's (DEQ) draft Internal Management Directive on trading.

R.5.: If a restoration action includes planting as a component, that planting must consist of locally-sourced native species to the extent available.

R.6.: Planting must consist of suitable diversity and maturity, which are planted at established density levels based on appropriate reference conditions. Each market will set minimum standards.

R.7.: For riparian planting, the planting plan should include an appropriate mix of trees AND shrubs (e.g. no less than 20% of stems as trees and no less than 20% of stems as shrubs).

4.1.3 Land protection

Creditable projects will also need to include land protection agreements to sell credits. These requirements may vary by market, but land protection ensures benefits are protected as landowners may change. Long-term agreements that run with the land, such as easements, are always preferable to short-term contracts. Yet, requiring permanent easements is a significant barrier to entry and is not recommended for temporal impacts. Recommendation R.8 is based on current wetland rules and DEQ guidance on temperature trading.

R.8.: For permanent impacts (e.g. wetland removal and fill or species take), creditable projects need permanent conservation easements or equivalent (deed restrictions, covenants, or

agreements from public agencies)t. For temporal impacts (e.g. air or water pollution), creditable projects, at a minimum, need a lease covering the crediting period of the project. For example, if nutrient reductions are sold for five years, there needs to be at least a five year lease with the landowner to protect those reductions.

4.1.4 Buyer eligibility

Buyers will also need to meet some minimum standards before accessing markets. These standards are often set in agency rules. This includes targeting credit purchases to priority restoration and conservation areas. Recommendation R.9 is based on Clean Water Act requirements for NPDES permits and removal-fill permits.

R.9: Require that buyers avoid or minimize the impact of their development actions, by being in full compliance with all relevant laws and rules related to offsetting their impact through the best practicable technology and practice, prior to using credits to offset impacts. Agencies will provide buyers with documentation if this requirement is met at the planning level and/or design level of an impact project.

In DEQ's temperature trading guidance, there is a proposed requirement for permitted buyers to purchase a percentage of their credits from a priority area. Investment in priority areas will be incentivized in the Credit Calculator's methodology. Projects in high value areas will get more credits. Most markets deal with priority investment on the seller's side. This requirement for buyers guarantees investment in priority areas.

R.10: Require that buyers maximize their credit purchases from priority locations as defined for each market.

Comment [c2]: Some markets may not be able to direct buyers in this way (e.g. if policy favors one supplier over another). May also not be feasible for buyers offsetting all their impacts from one site, since their choice of site selection will be constrained.
May change "require that" to "urge"

4.1.5 Trade and service areas

Most eligibility will be dealt with as buyers and sellers access markets, but some trades are not appropriate. Service/trading areas make it clear market participants which types of buyers and sellers can conduct trades with each other. Recommendation R.11 comes from current defaults in wetlands and water quality trading programs in Oregon.

R.11: Require all trades abide service area restrictions specific to the currency being traded. For wetlands, salmonids, and water quality, the 4th-field hydrologic unit is the default size of the service/trading area unless a compelling case can be made by any party to expand or constrict the size.

R.12: For prairie and other species, the Willamette Basin is the default size of the service/trading area unless a compelling case can be made by any party to expand or constrict the size. Recovery Plan area will be defined as the service area for listed species with recovery plans.

4.2 Verification and Credit Issuance

Similar to eligibility criteria, verification and credit issuance are types of assurance that apply to sellers, buyers and individual trades. Verification is the process of taking credit estimates produced by project developers, confirming that the project meets the market's minimum quality standards and eligibility, that the quantity of credits were estimated accurately, and that all procedures have been followed and documentation is in place. Verification can range from intense, re-running of calculations and visits to the site, to office review of monitoring reports that confirm no significant changes have occurred. Intense verification is often referred to as "full" or "complete" verification, and the check-ins are often termed "partial" verification. Credit issuance is the act of the market manager to review the verification report and the credit proposal and issue credits. Carbon markets have developed the most standardized processes for credit verification and issuance. Recommendations R.13- R.20 are drawn from the Climate Action Registry's General Verification Protocol

(<http://www.theclimateregistry.org/resources/verification/verification-process-overview.php>) and the Willamette Partnership's Temperature Trading Handbook (www.willamettepartnership.org).

Currently, public agencies fill both the verification and the credit issuance role in many markets. For example, the Interagency Review Team (IRT) for wetland mitigation banks verifies projects via annual site visits and issues credits as it authorizes credit releases. The process is often conducted on a case by case basis, which builds some uncertainty into the system for buyers and sellers. Recommendations R.13-R.20 are modeled off of a third-party verification system with agencies retaining the role of issuing credits. This model is different from current practices in markets like wetlands, but can still work in a system where agencies fill the verification roll.

R.13: Require that all credits, prior to receiving certification and being placed on a registry, undergo verification by a neutral third-party and certification by an agency/market administrator.

R.14: Require that a market administrator accredit a pool of qualified verifiers. Verifiers will be assigned randomly to projects from that pool.

R.15: Require a five-year verification cycle where all credits undergo a full verification in Year 1, which includes confirmation that the credit calculation was done correctly and confirmation that the supporting data accurately represents conditions in the field, when they are first submitted to the registry. Annual, partial verification of monitoring reports submitted by sellers will be conducted in Years 2-4. Site visits in years 2-4 are not required, but can occur at the discretion of the verifier or the responsible agency. Another complete verification will be conducted in Year 5. Verification cycles continue through the life of all credits.

R.16: For permanent impacts, verification will occur in two phases. Phase I is described by the cycle in R.15 and continues through the development life of a credit project. As a project moves into long-term management, only a full verification will occur every five years, and only if required by the agencies/market administrator.

R.17: Require that the debits a buyer is accountable for be verified with the same level of rigor as the credits a seller produces. As buyers move through verification, re-opening clauses in agency or market agreement are minimized.

R.18: Require that verifiers themselves be responsible for avoiding any conflicts of interest, including agreement to a conflict of interest code and changing verifiers for a given project every five years.

R.19: Agencies will certify the reports submitted to the registry by verifiers and issue credits unless they delegate certification to a third party. Credits generated by mitigation done in advance of impacts and in accordance with market rules will count toward future impacts.

R.20: Require the verification of trades through a single credit registry maintained by the agency or a third party market administrator. Require the registry to serialize credits, a process that attributes a unique identifying number to each credit that ties it back to its place of origin, so no credit can be sold more than once. Require annual reporting and that all documentation emerging from the credit verification process be readily available on the registry for agency and public review. In the case where credits can be re-sold, transferred to third parties, or are otherwise fungible, the seller shall remain responsible for verification, and the registry shall track the credit serial numbers and quantities for each account holder.

4.3 Risk Management

In many ways, all assurances are a form of risk management, yet there are three tools commonly used in markets to manage risk. These include the liability rules for who is responsible if a project fails or if something goes wrong, trading ratios or discount factors applied to credits and debits, and increasingly, forms of insurance to account for project failure. For this project, discounting and trading ratios will be incorporated as part of the credit calculation methodology and are not addressed here.

4.3.1 Liability Rules

For existing markets, liability rules are fairly well established. There are two forms of liability. Regulatory liability stems from permits or agency enforcement rules and contract liability that rests in the agreement between buyers and sellers. In most cases, regulatory liability is transferred from buyers to sellers of ecosystem credits. This is true for wetlands, species, and carbon markets. Once an agency approves a buyer's mitigation plan, and the buyer purchases credits, the buyer is not responsible for the performance of credit projects. This is not true for most water quality trading programs, where the buyers or point sources holding discharge permits remain liable. There are some examples of water quality trading programs where a third party or buyers association has taken on collective liability for its member point sources. Unclear liability rules is a problem in many markets, creating hidden costs, distorting credit prices, and causing hesitation for people to enter the market. Recommendation R.21 maintains the status quo for liability in current markets but recommends the model used in wetlands for releasing buyer liability upon purchase of credits.

R.21: Retain liability rules for current markets. For new markets (e.g. prairie and salmonids), transfer regulatory liability from buyer to seller upon purchase of the necessary credits.

4.3.2 Reserve Pools

Increasingly, many markets are using financial insurance and reserve mechanisms as a replacement or supplement to trading ratios. The Voluntary Carbon Association requires a project to hold a percentage of its credits back in reserve in case a project fails. The entire program maintains a reserve to protect the whole program in case an individual's insurance pool cannot cover the loss. The Great Miami water quality trading program uses trading ratios to account for uncertainty, but it dedicates the initial credits generated from those ratios to hold in reserve. Other carbon markets require financial insurance to cover the costs of replacing restoration projects. Wetland markets require performance bonds on many of its banking projects. Performance bonds and insurance cover financial risk, by paying out cash when something goes wrong. Reserves cover ecological risk, covering environmental losses by the reserve of credits. Recommendation R.22 uses the Voluntary Carbon Association model of a reserve pool of credits populated through discount factors in the credit calculator to act as a reserve pool.

R.22: Create a Reserve Pool of credits managed by a regional market coordinator that can be accessed as a last resort for projects that fail because of force majeure or other acts beyond control of the seller, or for project failures that cannot be resolved. In the last case, sellers will need to rent credits from the reserve to provide to buyers until they can arrange to resupply buyers' accounts. In addition, government or other funding may choose to invest in the reserve to acquire more credits/fund more projects to create a stronger back-up to their trading programs. A performance bond or other up-front financial insurance could be used to ensure the money is available to acquire reserve pool credits in cases where a project developer goes bankrupt, or otherwise is unable to cover the costs of accessing the reserve.

4.4 Performance Standards and Credit Release

Ideally, performance standards and management goals will be based on a local reference site. If a local reference site is not available, historical conditions and/or a proxy condition pieced together from other sources can be used. The standards below are drawn from the state's wetland mitigation banking template and the planting goals in DEQ's Internal Management Directive guidance. Mitigation in advance of impacts is always preferred, but not always feasible.

4.4.1 Performance standards

Generally, all projects will have performance standards that they must meet over a given time period that can be verified through annual monitoring. The implications and resolutions for missing performance targets will vary by market. Recommendation R.23 represents a combination of emerging standards in Oregon's wetland mitigation banking program and planting guidelines for the temperature market.

R.23: The targets below represent some of the typical minimal standards:

- A. Less than 15% mean aerial cover of non-native invasive plants over the credited area*
- B. Greater than 55% mean aerial cover of native plant species over the credit area*
- C. For species markets, there is presence of target plant and/or animal species or their habitat (e.g. Kincaid's lupine or salmon habitat)*
- D. For wetlands, wetland hydrology and vegetation, as defined in the 2007 Arid West Supplement to the 1987 Corps Wetland Delineation Manual (U.S. Army Corps of Engineers 2006), shall be present in the wetland area within the first 5 years after construction”.*
- E. The registry will also track progress toward meeting other conditions and commitments made by buyers or sellers as part of their permits/agreements*

4.4.2 Credit release schedules

In some markets, credits are released upon completion of the action. In others, they are released over a phased schedule. In either situation, “advance credits” are those credits released for sale before the project is delivering the fully estimated suite of ecosystem services. Sellers often need to sell advance credits to fund the ongoing construction and maintenance of a project. Yet, as more advanced credits are released, there is greater risk that impacts aren’t fully mitigated. Recommendations R.24-R.29 is based on Oregon wetland mitigation banking guidance.

R.24: No more than 30% of the total estimated credits for a project site can be released in advance without adjusting the trading ratio. In the case of temperate markets, the trading ratio is adjusted up to 2:1 to account for the 100% release of advance credits.

R.25: For advance release, the credits need to be verified and issued based on as-built designs, land protection agreements need to be in place, and the major construction phase of the project must be complete (e.g. channel work, hydrological modification, planting, etc...).

R.26: When the project achieves its first suite of performance targets, up to 50% of the credits can be released.

R.27: When it reaches its second suite of performance targets, up to 80% of the credits can be released.

R.28: Once a project has reached all of its performance targets and a long-term management plan is in place and functioning, and remaining credits can be released.

R.29: If a project reaches 100% of its performance targets sooner than anticipated, and a trading ratio had been applied for releasing greater than 30% of credits in advance, some of these credits can be returned and made available for sale at the sole discretion of the lead agency.

4.5 Programmatic Monitoring and Adaptive Management

Managing emerging markets is an iterative process. To the extent possible, adaptation needs to be designed into the market in a predictable way. In many markets, there is an unclear link between the project-level monitoring needed to verify and issue credits and the programmatic level monitoring needed to evaluate overall performance. As a result, there are incomplete pathways for adapting programs to address new information or adjust for performance problems. Recommendations R.30-R.33 were adapted by the Great Miami water quality trading program in Ohio (http://www.miamiconservancy.org/water/quality_credit.asp). None of these recommendations would affect the credits previously issued to market participants.

R.30: Project-level monitoring will be conducted using the Integrated Ecosystem Credit Calculator methods as part of the annual verification cycle to maintain credits.

R.31: Verification reports will be stored in a central database and made available to the public and managing agencies to assess progress and performance of programs. Data from verification reports needs to be linked to a landscape-level monitoring plan. Individual market participants will not be liable for program/overall market performance.

R.32: In addition, 15% of credited projects should be monitored in detail every year by a third party for the purposes of program evaluation, not credit evaluation. This monitoring information will not affect the allocation of credits to those projects. This information will be used to adjust credit calculators, assurances, and other program elements on a two-year cycle.

R.33: Rule changes that have a major impact on existing market participants will be limited to those two-year windows.



Ecosystem Credit Calculator

A product funded by an NRCS Conservation Innovation Grant

COMMENT DRAFT: Willamette Water Quality Crediting Protocol

Summary

The Ecosystem Credit Calculator's Water Quality Crediting Protocol is based on two sets of models. The temperature crediting portion is built from the Dept. of Environmental Quality's Heat Source Model and Shade-a-Lator version 6.2. The nutrient and sediment portion will be constructed and piloted in the Tualatin basin based on the Agricultural Policy Extender model developed by USDA Natural Resources Conservation Service and the Texas Institute for Applied Environmental Research. The temperature credit portion can be applied to riparian revegetation, and the nutrient/sediment portion can be applied to changes in irrigation, crop cover, fertilizer use, tillage, and use of filter strips. The protocol cannot be applied on the debiting side to point source discharges. Other models will be used. The model can capture the temperature or nutrient contributions from actions taken on the site level that alter land cover and land use. The protocol requires users to first define the assessment area, then divide the site into subunits, and then answer questions tied to indicators. These are used to feed models that generate quantities of temperature or nutrient/sediments reduced at the edge of the field or stream. The output of the protocol is a kilocalorie/day for temperature and a pound/year for nutrients and sediments.

Current status and documents included

The temperature crediting protocols have been vetted extensively. A temperature handbook is available on the Willamette Partnership's website and the Dept. of Environmental Quality has issued guidance on trading. For temperature, some additional work is needed to standardize which model version gets used and which assumptions for vegetation heights are used. For nutrients, work needs to be done to calibrate the models for crops, management practices, and other conditions in Oregon. Work also needs to be completed around discount factors tied to contextual value, delivery of nutrients from field to stream, and then from stream to point of concern.

Action needed

None on the credit calculation methods at this time. We ask water quality stakeholders to focus their comments on the proposed integrated package of assurances. There is no current documentation for nutrients/sediments. This will be created for the Tualatin by August 2009. Documentation for temperature can be found on the Willamette Partnership's website.

Questions to guide comments

1. None at this time

Submitting comments

Please submit comments by email to Joni Shaffer at jshaffer@willamettepartnership.org before May 15, 2009. Questions can be directed to Bobby Cochran at cochranb@cleanwaterservices.org or 503-681-4435. Thanks!





Ecosystem Credit Calculator

A product funded by an NRCS Conservation Innovation Grant

COMMENT DRAFT: Willamette Upland Prairie Crediting Protocol

Summary

The Ecosystem Credit Calculator's Upland Prairie Crediting Protocol uses a new approach developed by Paul Adamus working with a technical group of prairie experts. The prairie protocol captures the habitat functions provided by upland prairies. The credit protocol can be applied to prairie protection, restoration, and enhancement on the crediting side and site-level actions that alter vegetation or other natural systems on the debiting site. The protocol requires users to first define the assessment area, then divide the site into subunits, and then answer questions tied to indicators used to generate scores for a score for habitat function. This score is then weighted based on patch size, connectivity of the site to other prairie patches, and permeability of the site. The output of the protocol is a functional-weighted acre.

The protocol provides for optional indicators based on more detailed plant lists or plot data.

Current status and documents included

The current documentation includes an Excel Workbook with the field datasheet, species lists, and calculator for the site's contextual value. It also includes the beginnings of the additional steps needed to calculate prairie credits. By April 17, we will release additional documentation that rolls the scores for indicators into an overall score for habitat function and describes how discounting will work based on contextual value and risk.

3. Prairie Credit Calculator (PrairieCreditCalculator4.xls)
4. Prairie Calculation Guidance (Steps for using Prairie method April 01_09.doc)



Action needed

For these documents, we are seeking comments on indicator wording and answer choices and the factors determining the contextual value of the site. After April 17, we will be seeking additional comments on how indicators are rolled into a score for habitat function.

Questions to guide comments

2. Do the algorithms turning indicators into scores for ecological function work?
3. Do the discounting factors capture priorities for the context and risk tied to success?
4. Do the discounting factors present a feasible and economical framework?

Submitting comments

Please submit comments by email to Joni Shaffer at jshaffer@willamettepartnership.org before May 15, 2009. Questions can be directed to Bobby Cochran at cochranb@cleanwaterservices.org or 503-681-4435. Thanks!



Ecosystem Credit Calculator

A product funded by an NRCS Conservation Innovation Grant

COMMENT DRAFT: Willamette Salmonid Crediting Protocol

Summary

The Ecosystem Credit Calculator's Salmonid Crediting Protocol uses a library of methods compiled by Paramatrix, INC as its base for credit and debit calculations. The credit protocol can be applied to riparian revegetation, large wood placement, culvert removal, and riparian fencing on the crediting side and site-level actions that alter vegetation, hydrology, contaminant levels, or other natural systems. The protocol requires users to first define the assessment area, then divide the site into subunits, and then answer questions tied to indicators used to generate scores for seven site-level ecosystem functions. These functions are then weighted based on their connection to priority limiting factors in the watershed. The output of the protocol is a functional-weighted linear foot that reflects the percentage of ideal functionality a stream reach provides for salmonids.

The Paramatrix library of methods was developed through work with the Oregon Department of Transportation, Oregon Trout, internally-directed work, and other partners that worked extensively on the kinds of indicators and functions needed to define salmonid habitat.

Current status and documents included

The current documentation includes documentation describing each indicator, and explanation of the discounting approach recommended, and a field reference guide.

5. Salmon Currency Rules (XXXX.pdf)
6. Salmon Discounting Factors (XXXX.doc)
7. Salmon Field Guide (XXXX.pdf)



Action needed

The indicators and functions have been extensively vetted. We are asking for commenters to focus on the weighting factors applied to functions to account for landscape context and the weighting ratios applied to credit estimates to account for risk.

Questions to guide comments

1. Do the discounting factors capture priorities for populations and limiting factors?
2. Do the discounting factors present a feasible and economical framework?

Submitting comments

Please submit comments by email to Joni Shaffer at jshaffer@willamettepartnership.org before May 15, 2009. Questions can be directed to Bobby Cochran at cochranb@cleanwaterservices.org or 503-681-4435. Thanks!



Ecosystem Credit Calculator

A product funded by an NRCS Conservation Innovation Grant

COMMENT DRAFT: Willamette Wetland Crediting Protocol

Summary

The Ecosystem Credit Calculator's Wetland Crediting Protocol uses Version 2 of the Oregon Rapid Wetland Assessment Protocol (ORWAP) as its base for credit and debit calculations. The credit can be applied to wetland enhancement, restoration, and creation on the crediting side and removal/fill actions that alter wetland vegetation and hydrology on the debiting side. The protocol requires users to first define the wetland assessment area, and then answer questions tied to roughly 150 indicators to get scores for site-level ecosystem functions. ORWAP also produces scores to the landscape-level values, and the ecosystem services that the site produces for surrounding communities.

ORWAP was developed by Paul Adamus under contract with the Oregon Dept. of State Lands and with guidance from a Technical Advisory Committee convened by State Lands. It has undergone extensive vetting, repeatability, and sensitivity analysis. It is scheduled for adoption by State Lands and the Army Corps in late April 2009. This protocol takes the ecosystem service scores produced by ORWAP, combines them with area, to produce an estimate of marketable credits or debits.

Current status and documents included

The current documentation includes an Excel sheet with the ORWAP data sheets, algorithms, and outputs. It also includes a field manual to guide users of the methodology. By April 17, this protocol will also include several options for combing ORWAP scores with area to produce credits.

8. ORWAP Calculator (ORWAP_calculator_April01_09.xls)
9. ORWAP Manual (ORWAP_Manual near-final draft_March 30.doc)



Action needed

None before April 17. After April 17, we will be looking for comments on the discounting factors and approach for combing ORWAP scores with area to create credits.

Questions to guide comments

1. There are several options for turning ORWAP scores into measures of credit. Which of these options make the most sense to you? What are the pros and cons of each?
2. Do the discounting factors presented maximize potential ecological gains?
3. Do the discounting factors present a feasible and economical framework?

Submitting comments

Please submit comments by email to Joni Shaffer at jshaffer@willamettepartnership.org before May 15, 2009. Questions can be directed to Bobby Cochran at cochranb@cleanwaterservices.org or 503-681-4435. Thanks!