Eco-Logical
Webinar Series

Developing a Crediting Strategy

Step 6 of the Integrated Ecological Framework

Presenters
Jimmy Kagan, Institute for Natural Resources (Oregon State University / Portland State University)

Bobby Cochran, The Willamette Partnership

Introduction
Mike Ruth, FHWA Office of Planning

Volpe The National Transportation Systems Center

U.S. Department of Transportation
Federal Highway Administration

Integrated Eco-Logical Framework (IEF)

- Process to guide transportation and resource specialists in the integration of transportation and ecological decisionmaking.
- Helps identify potential impacts to environmental resources very early in the planning process.

Steps of the IEF
(and the Eco-Logical approach)

1. Build and strengthen collaborative partnerships
2. Integrate natural environment plans
3. Create a Regional Ecosystem Framework (REF)
4. Assess effects on conservation objectives
5. Establish and prioritize ecological actions
6. **Develop crediting strategy**
7. Develop programmatic consultation, biological opinion, or permit
8. Implement agreements, adaptive management, and deliver projects
9. Update REF

Step 6: Develop a Crediting Strategy
Questions to be addressed

- How does ecosystem crediting fit into the nine-step Integrated Ecological Framework (IEF) process? Why do it?
- What ecological categories (e.g. wetlands, water quality, endangered species) have more established crediting methodologies? Where is further research needed?
- What are some examples of how transportation agencies have partnered with resource, regulatory, or transportation partners to implement a crediting strategy that spans multiple jurisdictions?
- What tools, protocols, and data are available to help agencies begin to develop a crediting strategy? How can transportation agencies best access these tools?
- How can agencies adapt existing crediting protocols to new ecological services or geographic areas?

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Contact information

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STEP 6: Developing a Crediting Strategy; Ecosystem Services and Transportation

Jimmy Kagan

Institute for Natural Resources

Oregon State University & Portland State University

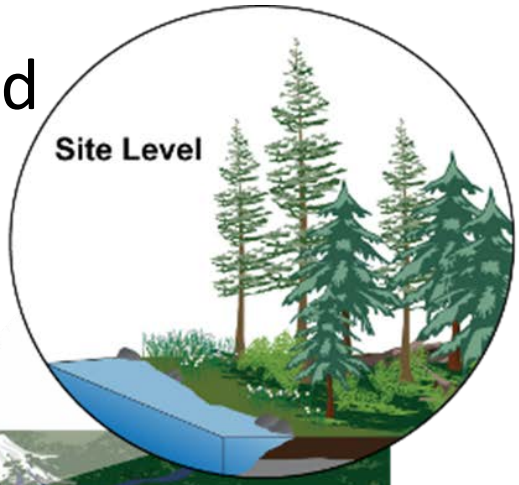
Portland State UNIVERSITY

Institute for Natural Resources

OSU Oregon State UNIVERSITY

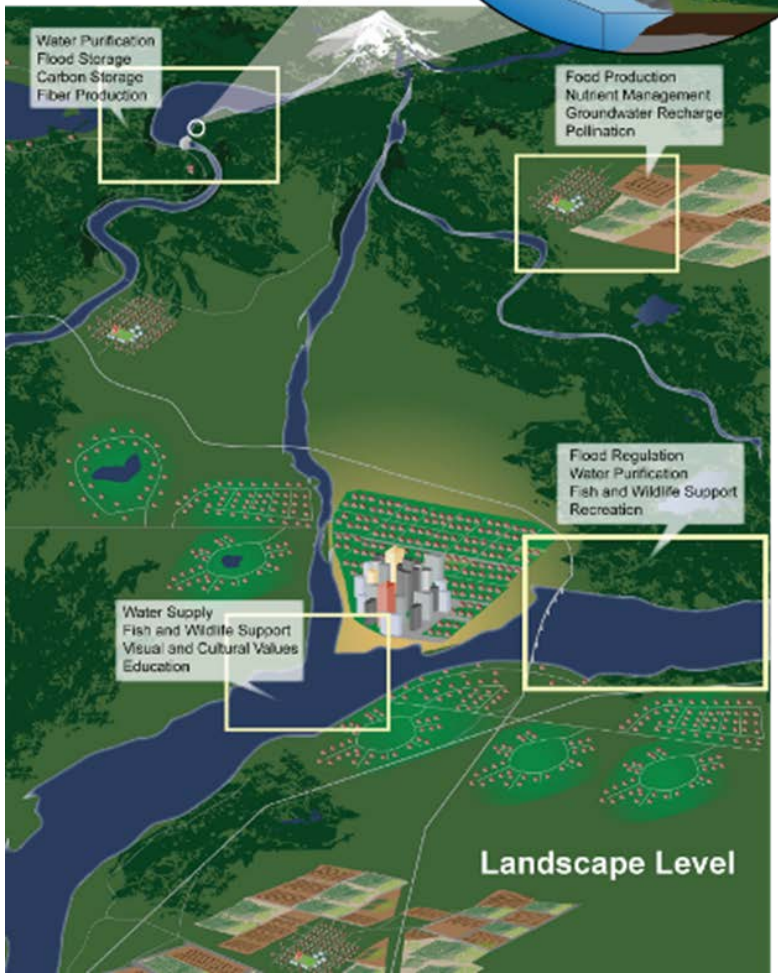
Ecosystem Services and Crediting Background

The ability to measure and value environmental benefits (clean water, air, food, fiber, climate regulation) may help assure these services are maintained over time.



Considering ecosystem service values -
---- costs and benefits ---
is an efficient way to consider both impacts and improvements to the environment.

A such it can represent a new way for transportation agencies and regulatory agencies to address unavoidable losses and associated mitigation.



Step 6: Develop Crediting Strategy

- Purpose:
  - Integrate mitigation sequence at site level: avoidance, minimization, compensation.
  - Development of a crediting system to accelerate implementation and improve the results of mitigation.
  - Support implementation tools like conservation/mitigation banks, programmatic permitting, and advanced mitigation.
- Outcomes:
  - Agreement on rules for field measurement of ecological functions.
  - Agreement on approved mitigation/conservation banking and expanded pre-approved multi-resource banks.
  - Outcome-based performance standards using credit system.

Regulatory Constraints and Institutional Barriers

- Regulatory Constraints
  - Traditional regulatory barriers
  - Suspicion of functional assessments or trading ratios
- Local Governments and Defining Service Areas
  - Optimal service areas may move mitigation outside of a jurisdiction that is losing resources
  - This may be exacerbated by statewide, large watershed or regional crediting strategies that identify mitigation banks and restoration priorities that occur outside local jurisdictions
- Funding and Organizational Barriers
  - An agency or organizational lead to maintain, update, warehouse, track transactions and funding for this effort
  - Institutional inertia (within DOTs, MPOs & Regulatory agencies)

Existing State Crediting & Trading Programs

- California – CEQA, RAMP and SAMI
  - Existing ESA and Wetland Banks potentially linked through newly developing initiatives
- Minnesota Wetland Restoration Strategy
  - Wetlands Restoration Strategy addressing advanced mitigation
- North Carolina Ecosystem Enhancement Program
  - Wetlands and Stream Mitigation & Crediting Program involving NC DENR and DOT
- Ohio River Basin Trading Project
  - Phosphorus and Nitrogen credit market involving electrical generation companies
- Willamette Partnership and Clean Water Services
  - Multiple trading, focused on ESA and CWA regulatory drivers

Ecosystem Accounting and Measurement example: Phosphorous

FILTRATION FUNCTION SCORE

The score for the Filtration Function is used as an indicator for Phosphorus Retention.

No Score	0	<10%	10-30%	30-50%	50-70%	70-90%	>90%
0%	0%	0%	20%	40%	60%	90%	100%

BUFFER WIDTH SCORE

Width x Slope Modifier

Width

<5	5-10	10-20	20-50	50-100	>100
0%	20%	40%	60%	80%	100%

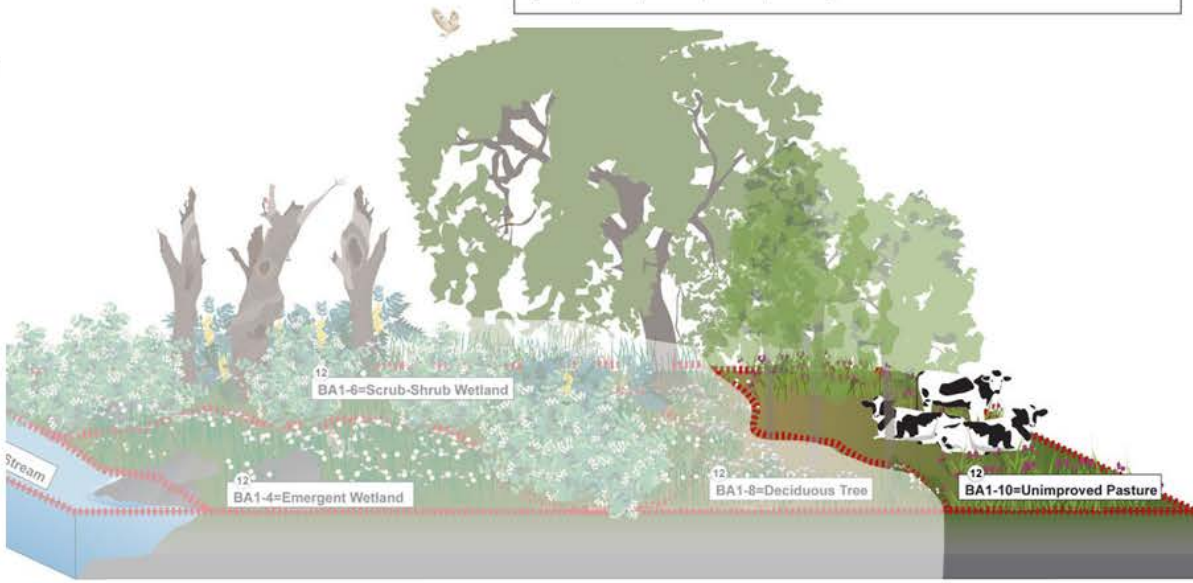
Slope Modifier

<5%	5-10%	10-15%	15-20%	>20%
100%	90%	70%	50%	50%

INFILTRATION FUNCTION SCORE

The score for the Infiltration Function is used as an indicator for Phosphorus Retention.

No Score	0	<10%	10-30%	30-50%	50-70%	70-90%	>90%
0%	0%	0%	20%	40%	60%	90%	100%



EQ. 1 **Phosphorus Retention FUNCTION** = $\frac{\text{Buffer Width (\% slope modifier)} + \text{Filtration Function Score} + \text{Infiltration Function Score}}{3}$

EQ. 2 **Functional Acre SCORE** = $\text{Acres} \times \text{Habitat Type} \times \frac{\left(\frac{\text{Function}_1 + \text{Function}_2 + \ldots \text{Function}_n}{n}\right)_{\textbf{ABIOTIC}} + \left(\frac{\text{Function}_1 + \text{Function}_2 + \ldots \text{Function}_n}{n}\right)_{\textbf{BIOTIC}}}{2}$

Considerations for Conducting Step 6

- Regional mitigation strategies and improved mitigation planning can significantly reduce the time and effort involved in this step.
- Implementing a function and service based inventory methodology (such as Rapid Wetland Assessment Protocols) in a state's regulatory framework can provide a critical head start.
- Creating statewide or area-wide service value maps can provide a useful head start, especially for improved mitigation planning.
- Identify Ecosystem Crediting Platforms or Protocols developed within the region, and evaluate their ability to be used in the REF ecosystems and landscapes.
- Select or develop units and rules for crediting.
- Negotiate regulatory assurance for credit.
- Develop guidelines (or copy them) for program implementation.

NCDENR

Employee Sign In

restoring... enhancing... protecting our state

N.C. Ecosystem Enhancement Program

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Request Nutrient Offset Credits | Fee Schedules

ACM Rates & Calculations | ILF Program Info.

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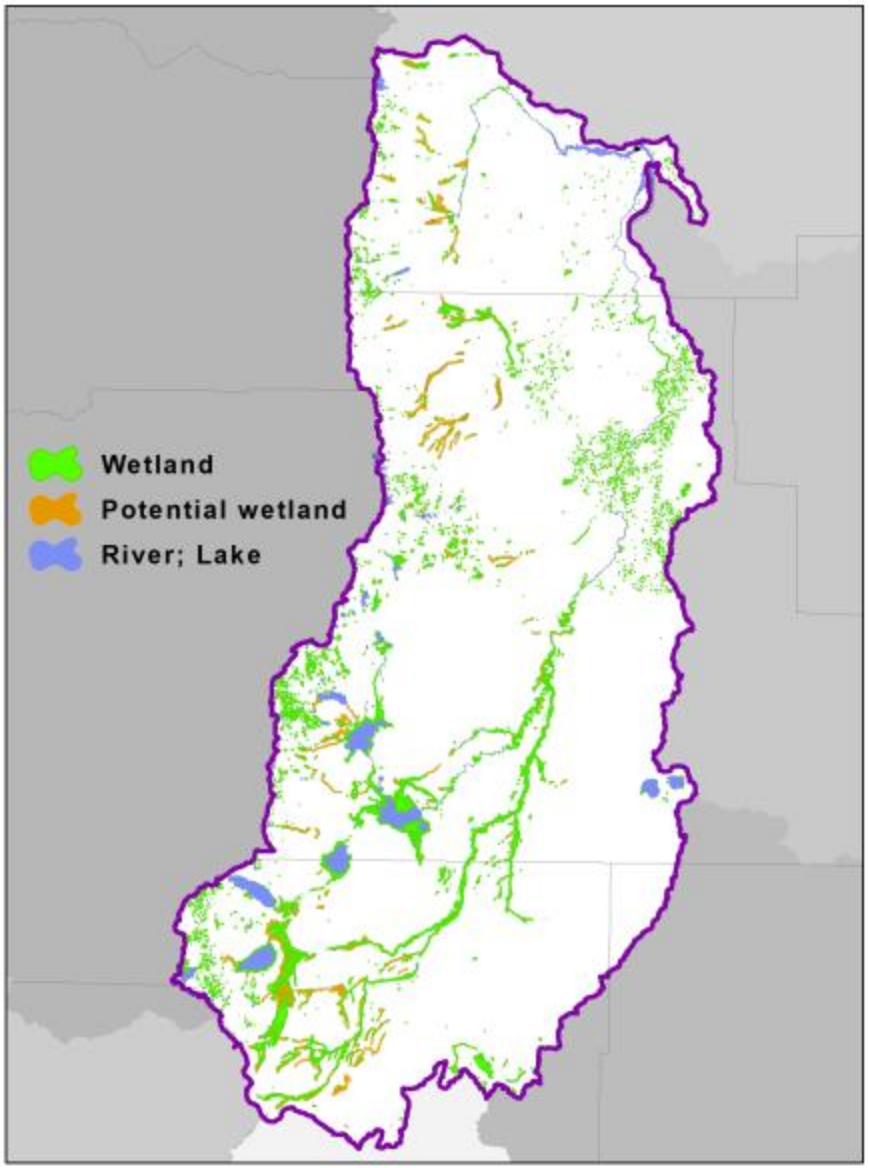
The N.C. Ecosystem Enhancement Program's mission is to restore and protect North Carolina's natural resources for future generations while supporting responsible economic development.

Montana Department of Transportation

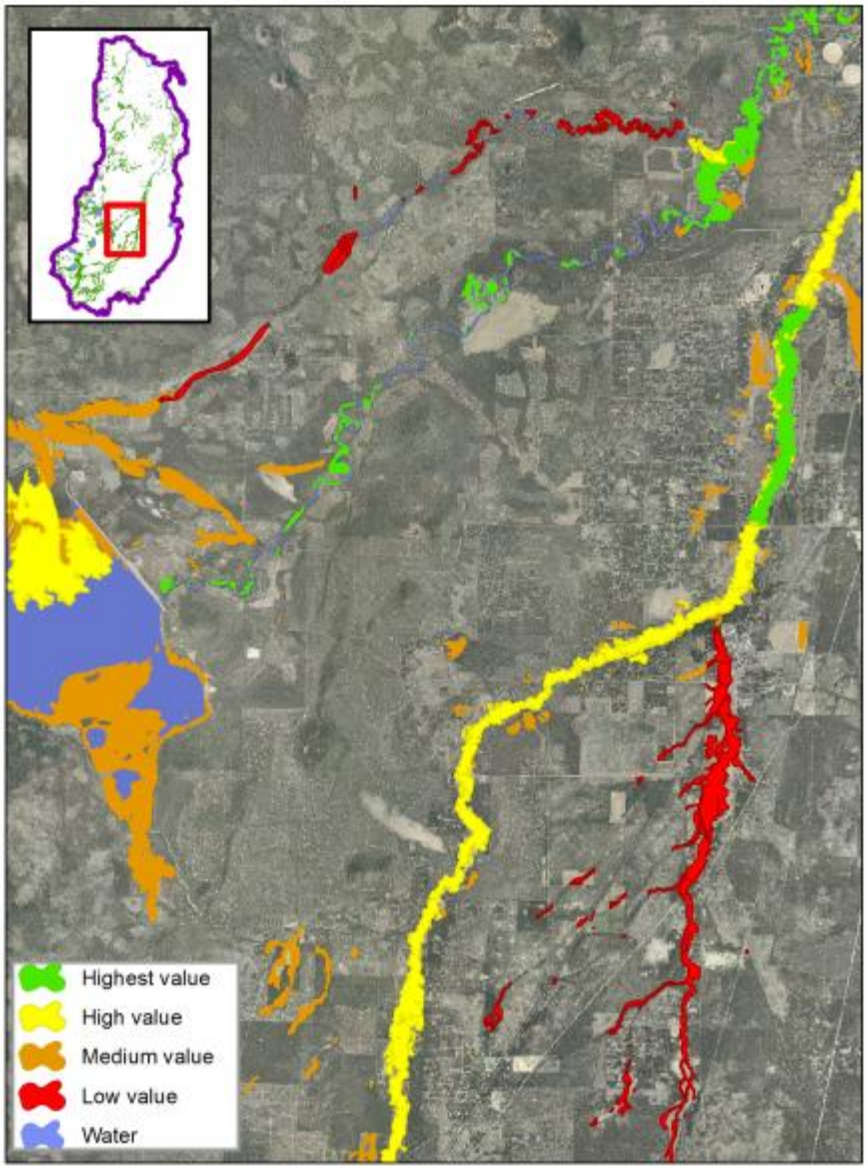
Montana Wetland Assessment Method

https://www.mdt.mt.gov/other/environmental/external/wetlands/2008_wetland_assessment/2008_mwam_manual.pdf

Upper Deschutes Basin Wetland Priorities



Ecosystem Services



Summary

- Crediting programs should be developed cooperatively with the all interested parties.
- Engage stakeholders early and often.
- An accepted Integrated Ecological Framework (IEF) with a conservation strategy for the state, watershed, ecoregion or area in which the crediting system is to operate is a great head start.
- It is easier to start with a single service that can be valued, generally endangered species, wetlands or streams with existing markets; or with a specific set of projects in a location. Build from there.
- Multi-service crediting systems are more useful but more difficult to establish. Creating these is easier once crediting partnerships, methods and tools have been adopted.

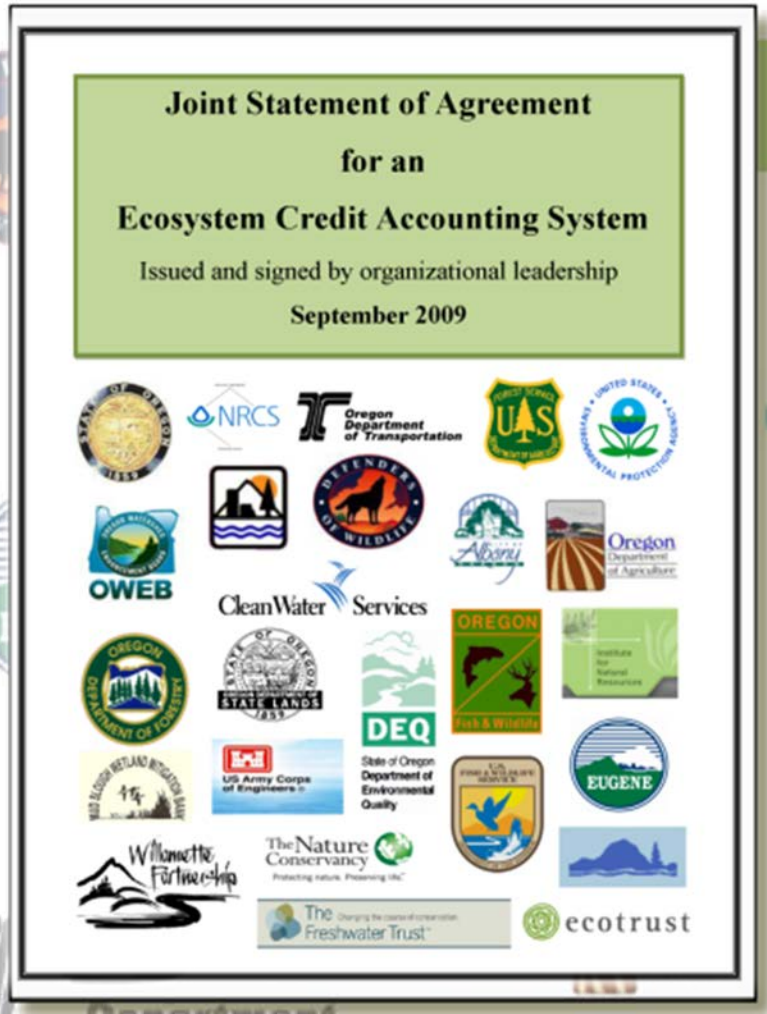
Building & Adapting a Crediting Strategy

What are we working for?

Increasing the Pace, Scope, Effectiveness of Conservation

Crediting Protocol

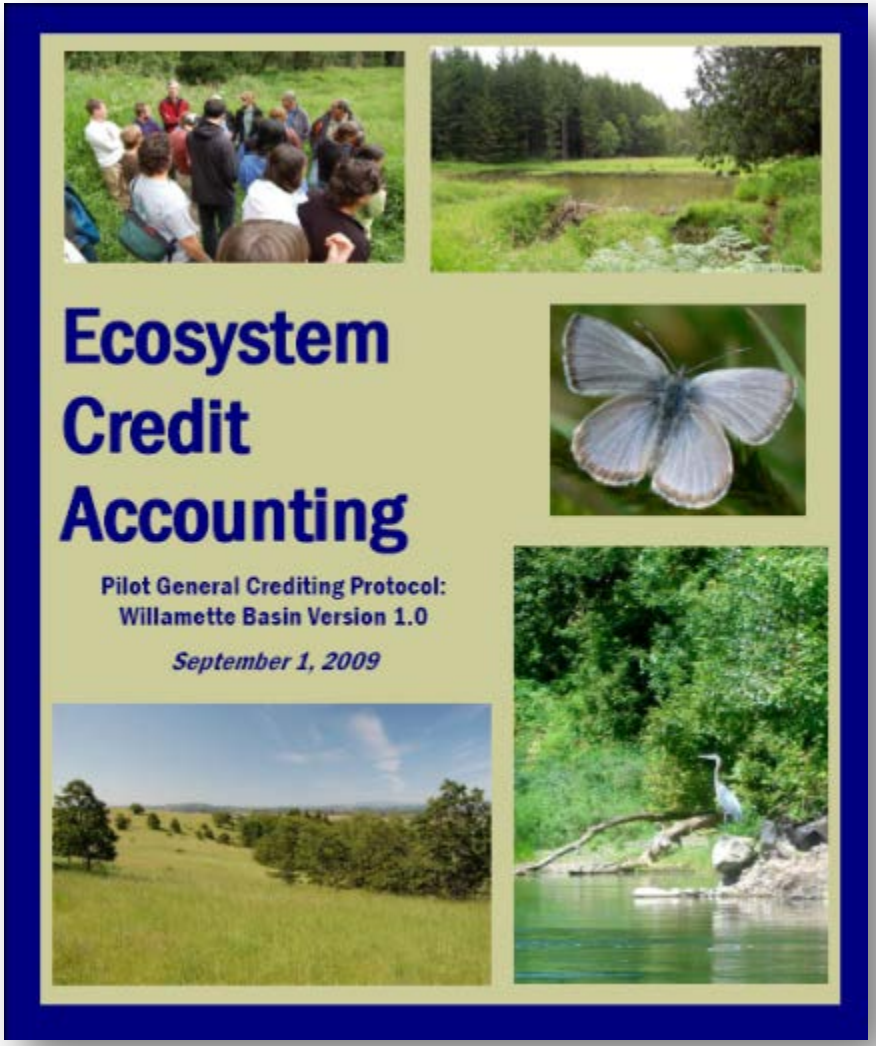
Standards, Metrics, and Process



Crediting protocol approved for use

Crediting Protocol

Standards, Metrics, and Process



Credit types

Wetland

Salmonid habitat

Upland prairie habitat

Water temperature

Water nutrients

Oak habitat

Coming soon

Floodplain habitat

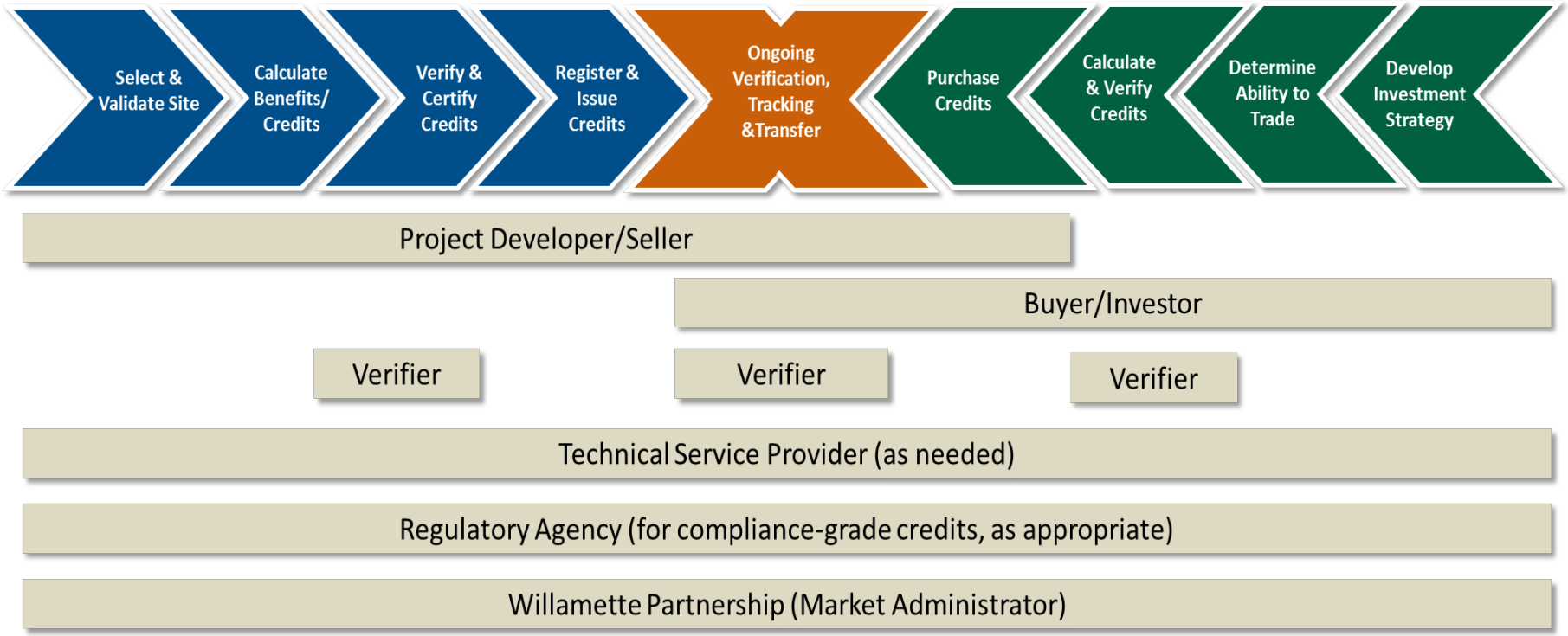
Sagebrush habitat

Benefits of flow

Credit Issuance Process

Validation through registration

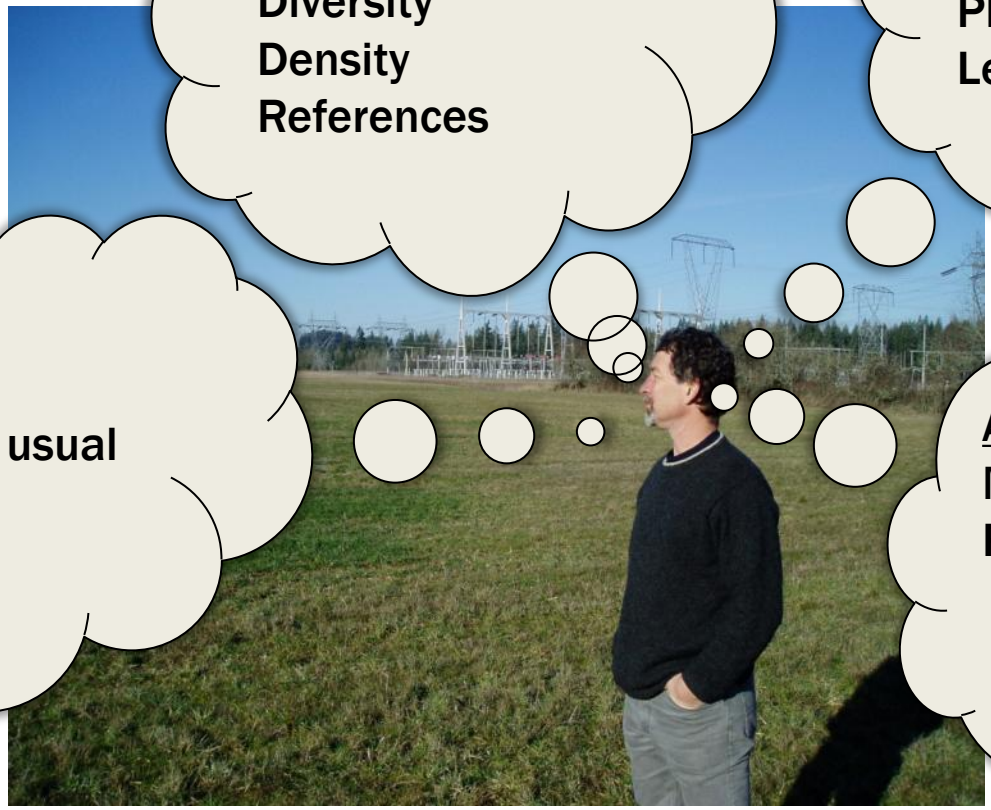
Steps for buyers and sellers:



Validation & Eligibility

Suitable
Local natives
Diversity
Density
References

Sustainable
Steward
Costs
Plans
Legal protection



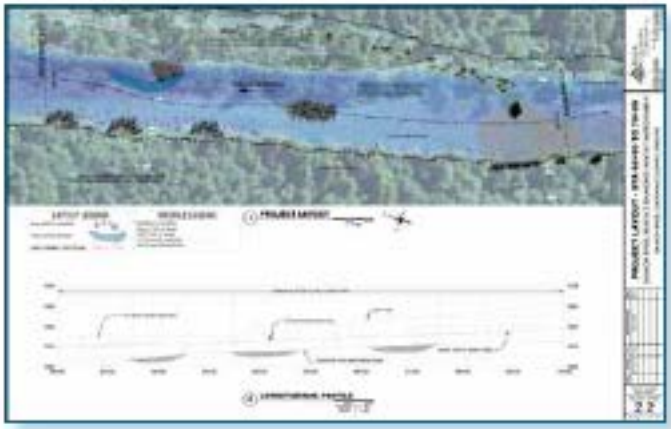
Additional
Required
Business as usual
No flipping

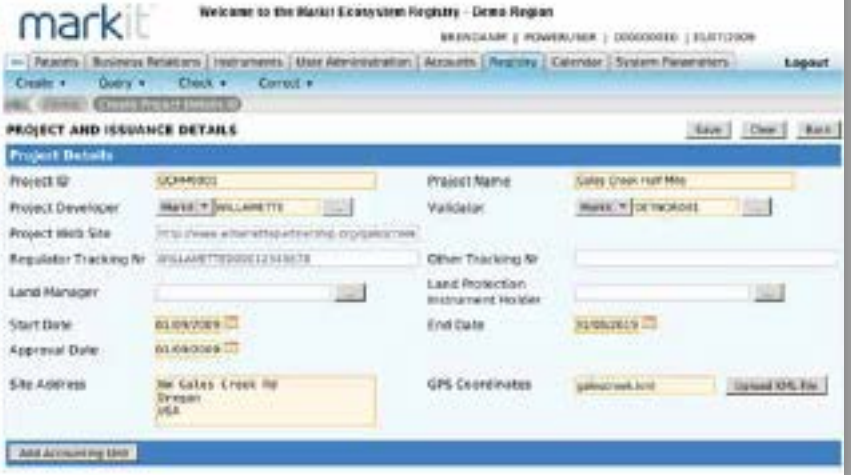
Avoid
Minimize
Permitted

Select & Validate Site → Calculate Credits → Verify & Certify Credits → Register & Issue Credits → Ongoing Verification, Tracking &Transfer

Willamette Partnership

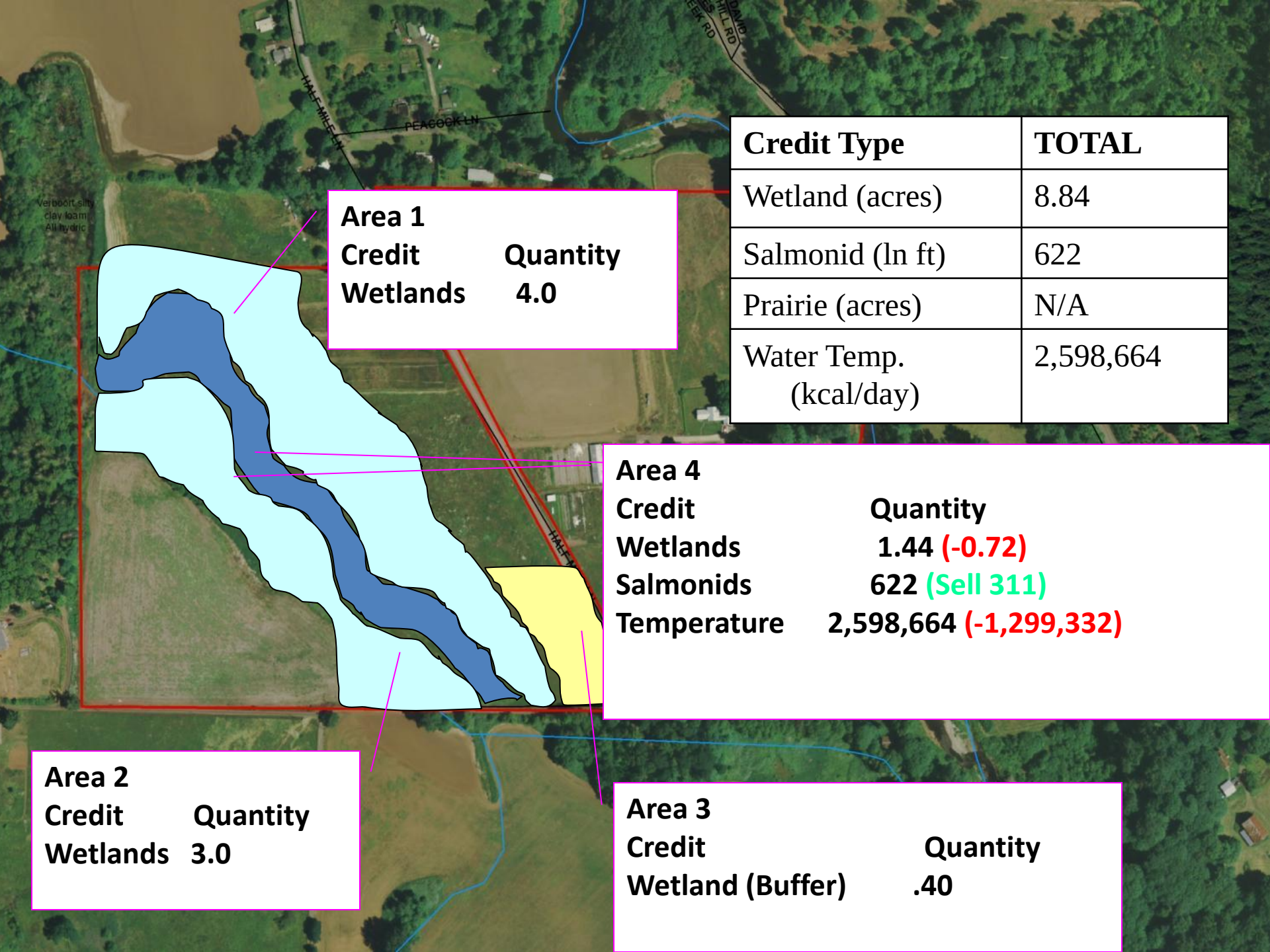
Verification





Select & Validate Site | Calculate Credits | **Verify & Certify Credits** | Register & Issue Credits | Ongoing Verification, Tracking &Transfer

Willamette Partnership



Credit Type	TOTAL
Wetland (acres)	8.84
Salmonid (ln ft)	622
Prairie (acres)	N/A
Water Temp. (kcal/day)	2,598,664

Area 1

Credit	Quantity
Wetlands	4.0

Area 4

Credit	Quantity
Wetlands	1.44 (-0.72)
Salmonids	622 (Sell 311)
Temperature	2,598,664 (-1,299,332)

Area 2

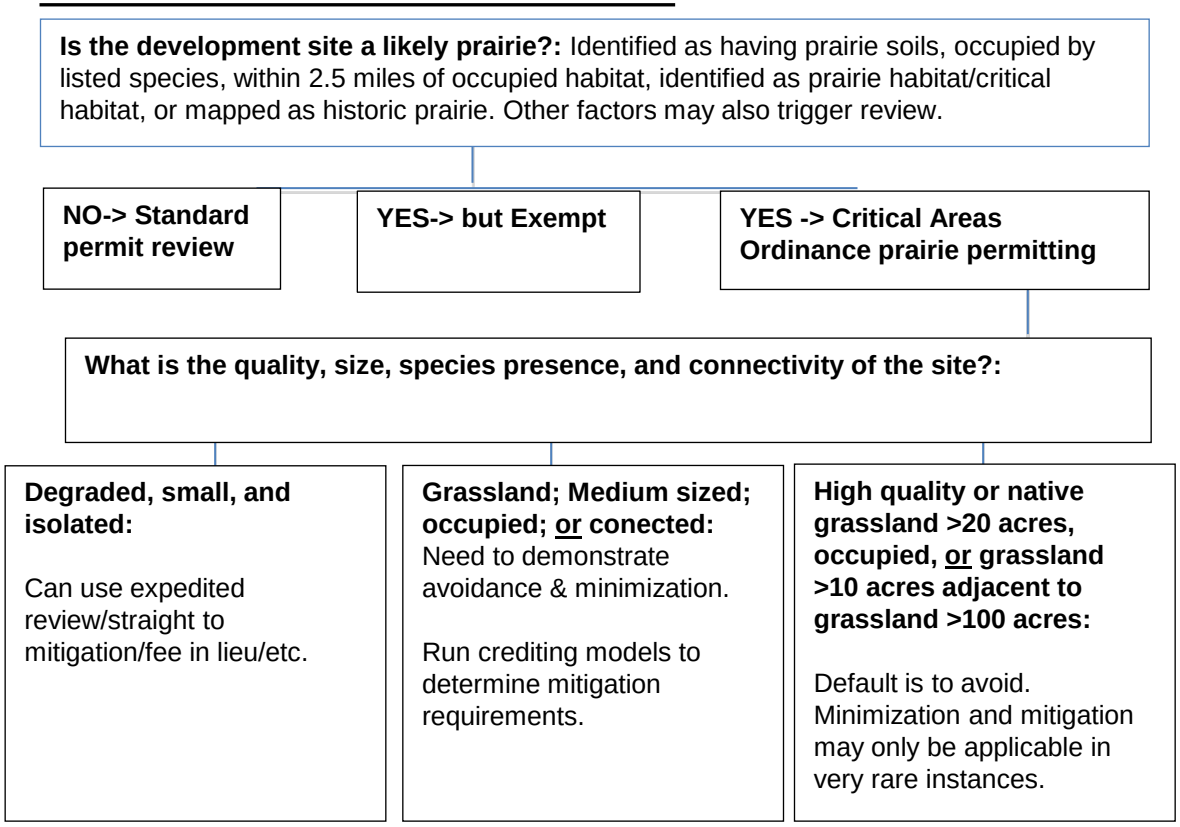
Credit	Quantity
Wetlands	3.0

Area 3

Credit	Quantity
Wetland (Buffer)	.40

Determining Impacts

A decision tree approach from Thurston County, WA



Ecosystem Crediting Platform

Welcome Bobby

My Projects

My Account/Admin Dashboard

Add a Project

Logout

Project Information | Project Baseline | Project Design | Project Verification | Project Certification | Credit Registration | Credit Issuance | Project Monitoring

PROJECT:
Half Mile Lane DEMO

Design Boundary | Map Units | Design Data | Credit Estimates | Priority Status | Accounting Units | Release Schedule | Submit Design

Accounting Units

Create Accounting Unit

Name this accounting unit and select the map unit(s) from the list that are part of this accounting unit.

Map units already assigned

Available map units

Name

Select Map Units

1. Roderick Creek
2. Map unit 2
3. Map unit 3
4. Field
5. SW Field

Save Accounting Unit | Cancel

Submit

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markit

Biodiversity & Water Registry Public View

ACCOUNT HOLDERS | REGISTERED PROJECTS | HOLDINGS | RETIRED CREDITS

Registry Search | Serial Number Search? | Display All categories | Page 1

Project Name	Project Id	Category(s)	Standard(s)	Project Type(s)	Status	Developer	Location
Blackburn Vernal Pool Conservation Bank	10013	Species Habitat	US Fish & Wildlife Service Conservation Banking	Vernal Pool Preservation	Active	Wildlands, Inc	United States, California
Deadman Creek Conservation Bank	10006	Species Habitat Species Habitat Species Habitat	US Fish & Wildlife Service Conservation Banking US Fish & Wildlife Service Conservation Banking US Fish & Wildlife Service Conservation Banking	Vernal Pool Preservation California Tiger Salamander San Joaquin Kit Fox	Active	Wildlands, Inc	United States, California
Evans Creek Instream Flow Restoration	10003	Water Quantity	BEF Flow Restoration Standard	Water Flow Restoration	Active	Bonneville Environmental Foundation	United States, Oregon
Gill Ranch Conservation Bank	10008	Species Habitat	US Fish & Wildlife Service Conservation Banking	Vernal Pool Preservation	Active	Gill Ranch Conservation Bank	United States, California
Great Valley Conservation Bank	10014	Species Habitat Species Habitat Species Habitat	US Fish & Wildlife Service Conservation Banking US Fish & Wildlife Service Conservation Banking US Fish & Wildlife Service Conservation Banking	Vernal Pool Preservation San Joaquin Kit Fox California Tiger Salamander	Active	Wildlands, Inc	United States, California
Half Mile Lane	10001	Species Habitat Wetland Habitat Wetland Habitat Water Quality Wetland Habitat Wetland Habitat Wetland Habitat Wetland Habitat	COTE: Willamette: Salmonid COTE: Willamette: Wetland Habitat Oregon Wetland Regulatory (Ratios) Standard COTE: Willamette: Water Quality (Temperature) COTE: Willamette: Wetland Habitat Oregon Wetland Regulatory (Ratios) Standard Oregon Wetland Regulatory (Ratios) Standard Oregon Wetland Regulatory (Ratios) Standard	Salmonid Freshwater Wetland Freshwater Wetland Temperature Freshwater Wetland Freshwater Wetland Freshwater Wetland Freshwater Wetland	Active	Oregon Department of State Lands	United States, Oregon
Kreyenhagen Hills Conservation Bank	10009	Species Habitat	US Fish & Wildlife Service Conservation Banking	San Joaquin Kit Fox	Active	Wildlands, Inc	United States, California
Laguna Terrace East Conservation Bank	10011	Species Habitat	US Fish & Wildlife Service Conservation Banking	Vernal Pool Preservation	Active	Wildlands, Inc	United States, California
Malua BioBank	10002	Species Habitat	Global Biodiversity Conservation (Various)	Biodiversity & Habitat Conservation	Active	The Eco Products Fund, L.P.	Malaysia
Prickly Pear Creek Instream Flow Restoration	10005	Water Quantity	BEF Flow Restoration Standard	Water Flow Restoration	Active	Bonneville Environmental Foundation	United States, Montana
Ridge Cut Giant Garter Snake Conservation Bank	10007	Species Habitat	US Fish & Wildlife Service Conservation Banking	Giant Garter Snake	Active	Wildlands, Inc	United States, California
Sutter Basin Conservation Bank	10017	Species Habitat	US Fish & Wildlife Service Conservation Banking	Giant Garter Snake	Active	Westervelt Ecological Services	United States, California
The Middle Deschutes Instream Flow Restoration	10004	Water Quantity	BEF Flow Restoration Standard	Water Flow Restoration	Active	Bonneville Environmental Foundation	United States, Oregon

Half Mile Lane (ID: 10001)

4036 Half Mile Lane, Forest Grove, Oregon, United States

Developer Oregon Department of State Lands

Description Wetland and Stream Mitigation Bank

Website

Start date 19-Mar-2010

Documents
- Project Design Document
- Letter linking project names & references
- Self Validation Checklist
- Notice of Validation
- Accounting Unit Area Map (refer Validation reports)
- Service Area Map
- Verification Report
- Agency Certification

Accounting Units

Area 1 - Floodplain & Channel:

Category	Standard	Project Type	Development Action (s)	Unit Type	Additional Credit Information	Linked	
Species Habitat	COTE: Willamette: Salmonid	Salmonid	Habitat Restoration, Riparian Restoration, Enhancement	Weighted Linear Feet		Yes	Details
Water Quality	COTE: Willamette: Water Quality (Temperature)	Temperature	Riparian Restoration	Kcal/day		Yes	Details
Wetland Habitat	COTE: Willamette: Wetland Habitat	Freshwater Wetland	Wetland Restoration, Enhancement	Functional weighted acres		Yes	Details
Wetland Habitat	Oregon Wetland Regulatory (Ratios) Standard	Freshwater Wetland	Wetland Restoration, Enhancement	Acre of wetland habitat		Yes	Details

Area 2 - Wetland:

Category	Standard	Project Type	Development Action (s)	Unit Type	Additional Credit Information	Linked	
Wetland Habitat	COTE: Willamette: Wetland Habitat	Freshwater Wetland	Wetland Restoration, Enhancement, Creation	Functional weighted acres		Yes	Details
Wetland Habitat	Oregon Wetland Regulatory (Ratios) Standard	Freshwater Wetland	Wetland Restoration, Enhancement, Creation	Acre of wetland habitat		Yes	Details

Lessons Learned

From those early pilots

- **PROGRAMS EVOLVE IN PHASES:** feasibility, convening, design, and operation
- **DEMAND IS LIMITING FACTOR**
- **TRANSACTION VOLUME IS "THIN"**
- **STATE AGENCIES ARE KEY**
- **LOCAL PROGRAMS NEED A LOT OF THE SAME THINGS:** There are a lot of consistent needs, but local stakeholders need to "own" their design decisions

Crediting Best Practices Outline

1. Regulatory instruments to support trading
2. Eligibility
3. Baseline & additionality
4. Credit quantification
5. Ratios
6. Credit characteristics
7. Credit verif. and certif.
8. Credit registration
9. Project site monitoring and record keeping
10. Compliance & enforcement
11. Program effectiveness and adaptive management

Ecosystem Markets

Catalyzing Investment in Conservation

Willamette Partnership
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(503) 946-8350