

Water Quality Trading for Temperature & Nutrient Compliance: A Turn-key Solution



Presentation to Upper Neuse River Basin Association

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Alex Johnson, Senior Freshwater Solutions Director



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Freshwater Trust® www.thefreshwatertrust.org

The Freshwater Trust

A 501(c)(3) non-profit organization with a 32-year history of actively working to preserve and restore freshwater ecosystems.



Habitat & Flow Restoration

Restoring stream, off-channel and riparian habitat to improve functional conditions for fish.



Ecosystem Accounting & Analysis

Measuring ecosystem services and translating them into units that make sense in a regulatory context.



Credit Program Management

Applying compliance-driven investments to needed habitat and water quality improvements.

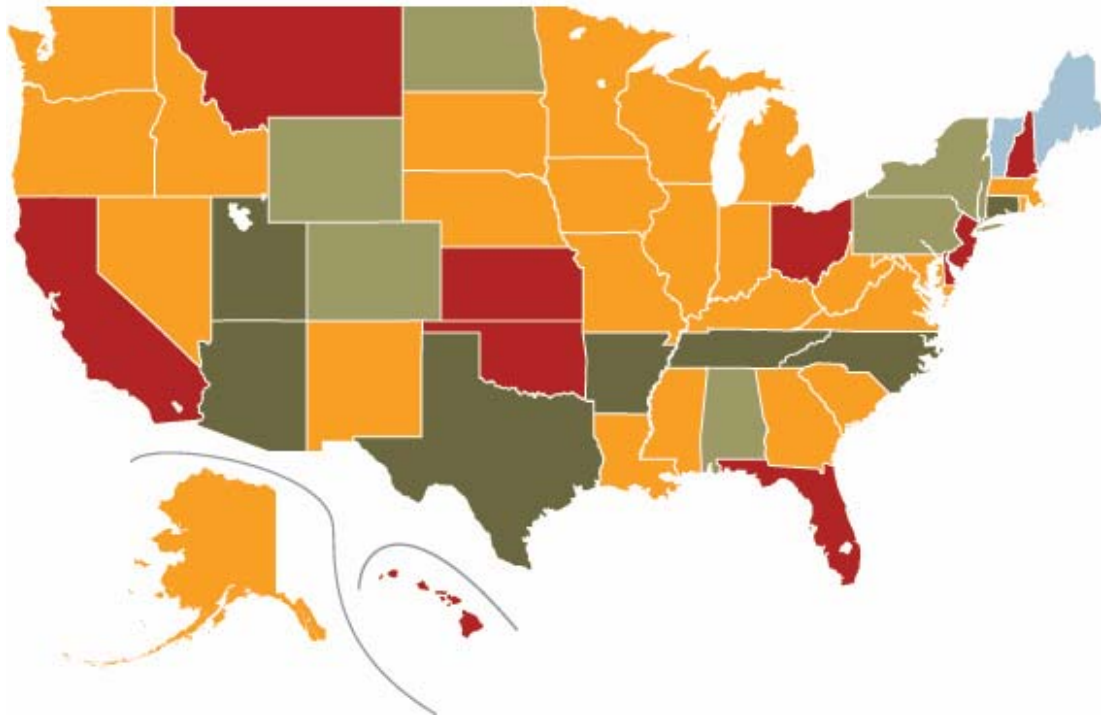


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Water Trends

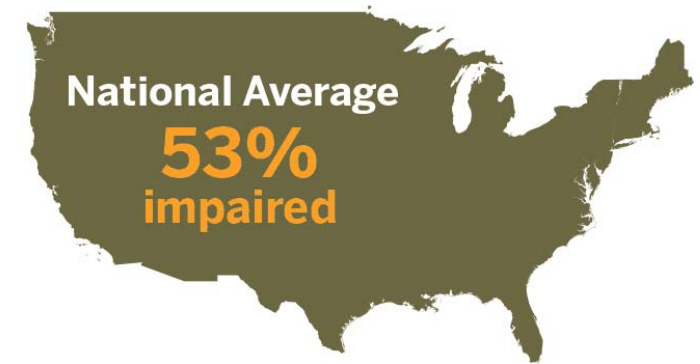
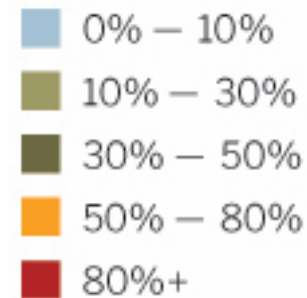
Impaired Waters in the United States

under Section 303(d) of the Clean Water Act



SOURCE: <http://www.epa.gov/waters/ir/>

Percentage of assessed rivers and streams reported to EPA as “impaired” or “threatened” water quality.

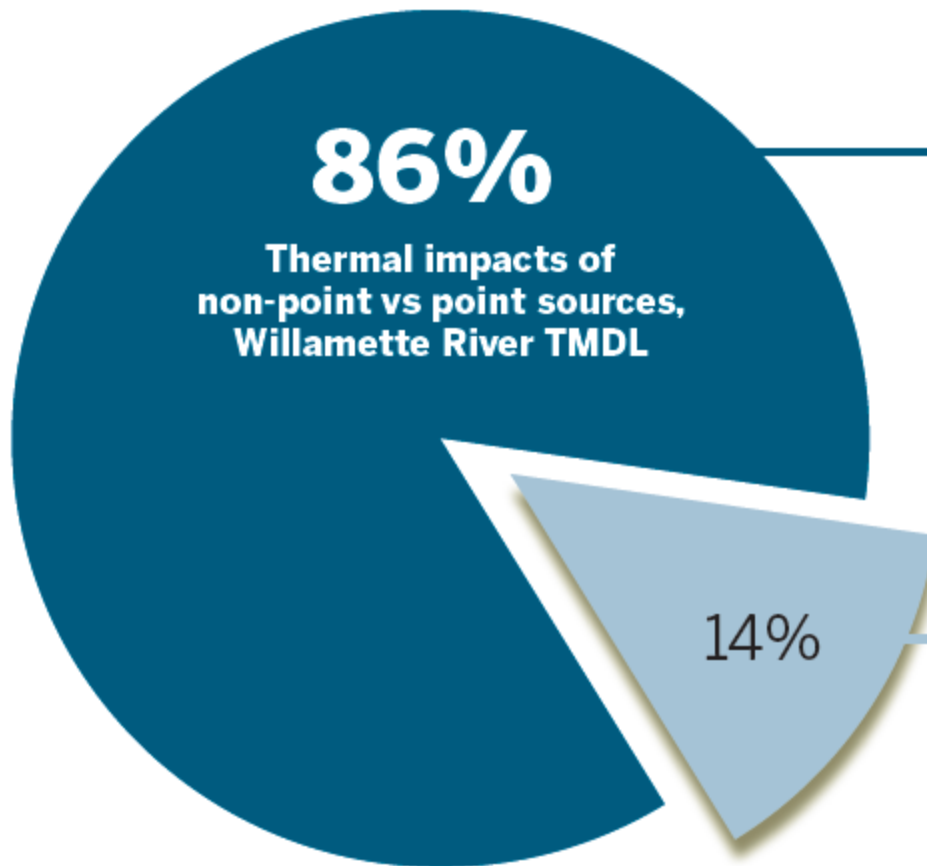


Existing Conditions

- **CONSERVATION REACTS** to environmental challenges at a small scale (fish, wildlife, water quality, etc.), after degradation
- **REGULATORY DRIVERS** are present on small percent of overall impacts
- **TECHNOLOGICAL SOLUTIONS** employed by regulated entities are appropriate for some, but not all, new parameters



New Approaches to Meet NPS Challenge



Non-Point Source



Point Source

Source <http://www.deq.state.or.us>



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Three Keys for Restoration to Work

For restoration to be viable compliance alternative...

CLEAR AUTHORITY:

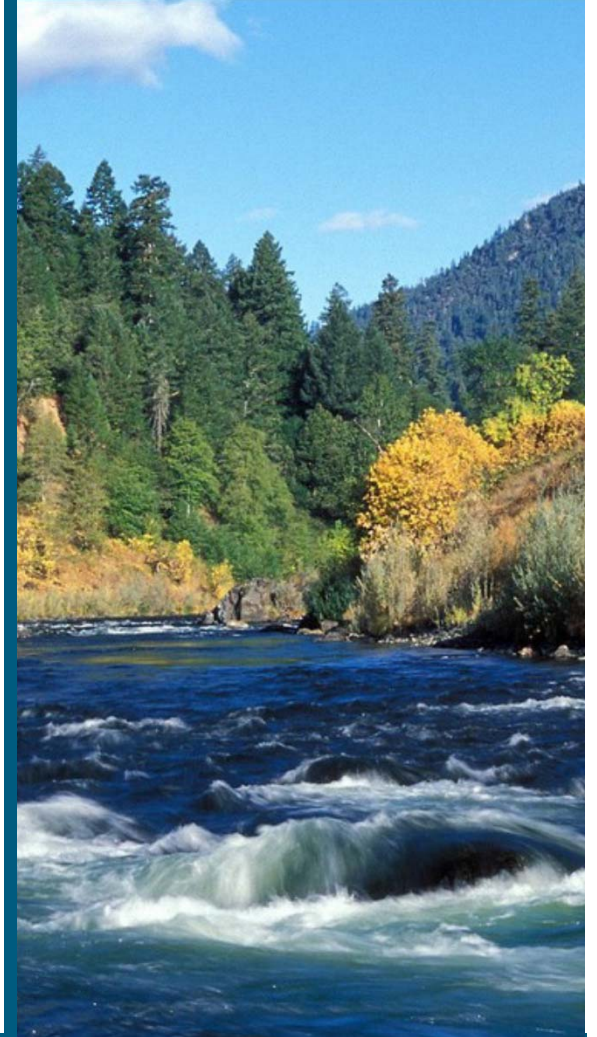
→ Regulators must adopt and promote required rules

CLEAR FRAMEWORK:

→ Approved standards and protocols for measuring ecosystem services and implementing credit generating projects

CLEAR ROLES:

→ Third parties willing to assure delivery of compliance-grade credits with secure, turn-key projects

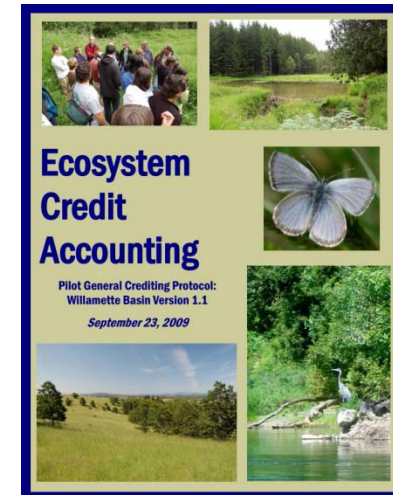


Regulatory Framework

Credit protocols from the Willamette Partnership, a third-party verifier of credits

- **General Crediting Protocol** for water quality trading
- **KTAP Protocols** for approved quantification methods for temperature and nutrients in the Klamath River

<http://willamettepartnership.org/market-tools-rules/water-quality/klamath-tracking-and-accounting-program/>



Step	Step #	Project Developer	Administrator	Investor	Methods, Forms & Instructions	Klamath TAP Products
Select & Validate Project Site	P1	■	■	□	Self-Validation Checklist	Notice of Validation
Implement Project & Calculate Benefit	P2	■	□	□	Field Datasheets, Benefit Release Schedule	Quantified Estimate of Ecosystem Benefits
Verify Conditions	P3	■	■		Verification & Monitoring Report, Agency Certification Form	Verified Project
Register & Issue	P4	■	■		Verification & Monitoring Report	Issued Ecosystem Benefits
Track & Transfer	P5	■	■	■	Approval of Transfer Form	Project Report & Defined Ownership of Ecosystem Benefits

Legend
 ■ Indicates a necessary or active role
 □ Indicates potential participations or a support role

Policy Foundations

Regional Recommendations for the Pacific Northwest on Water Quality Trading

Joint statement from ID, OR, and WA agencies (with EPA Region 10) that defines recommendations for implementing water quality trading.

<http://willamettepartnership.org/success-stories/regional-recommendations-water-quality-trading/>



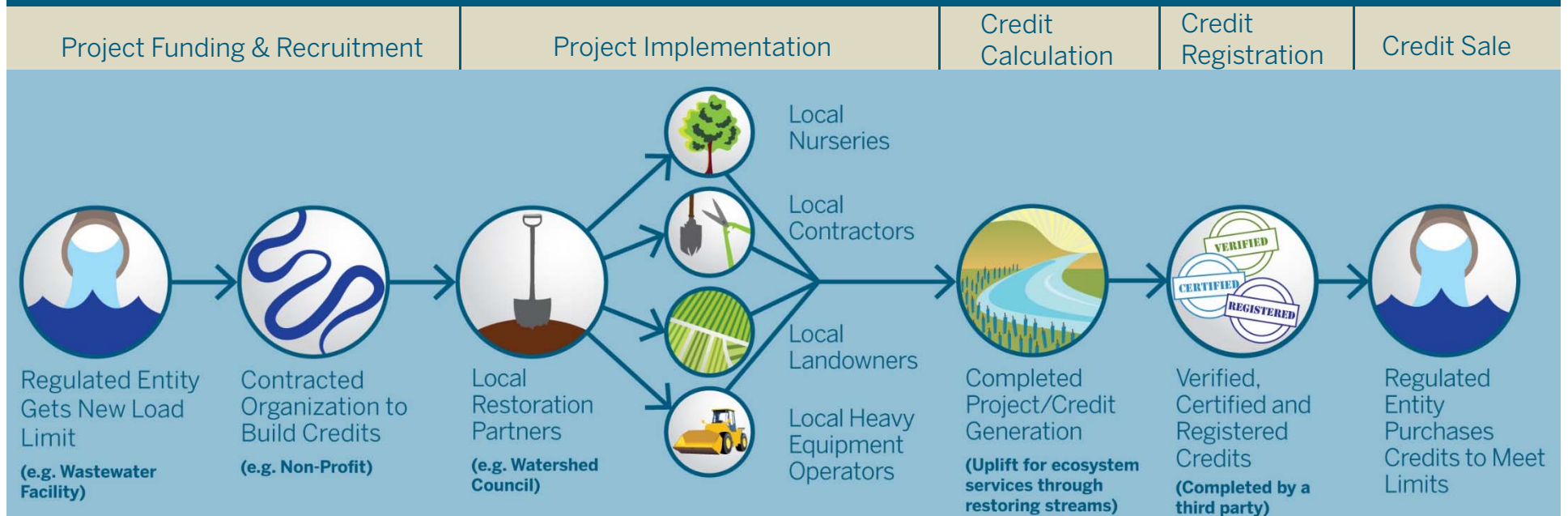
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Trading Programs Require Additional Steps

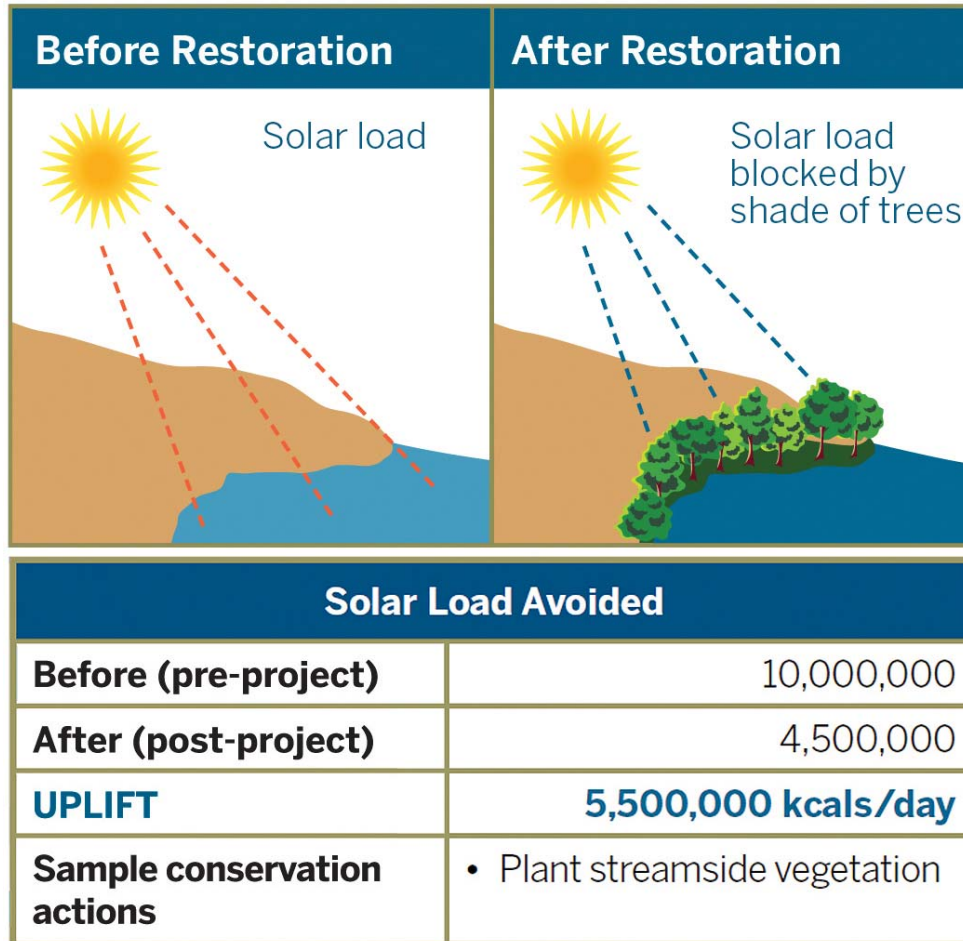
Traditional Restoration Steps	Compliance-Grade Credit Generation Steps
Identify project site	Identify project site
Fundraising	Financing
	Negotiate 20+ year contract with landowner
	Collect pre-project data
Project design	Project design
	Estimated credit values
Implement	Implement
	Verification that implementation meets standards
	Certification that credits meet accounting protocols
	Credit registration
Monitoring and maintenance (Years 1 – 3)	Monitoring and maintenance (Years 1 – 3)
	Monitoring and maintenance (Years 4 – 20)
	Annual payments to landowners (20+ years)



Transaction Process



Temperature Model



- Solar radiation is measured pre- and post- project implementation
- Reductions in solar radiation are the result of increased canopy cover for riparian re-vegetation or reduced channel surface area in channel modification projects

Case Study: Medford, OR

Buyer: City of Medford (population 170,000)

Seller: 20+ landowners in Rogue River Basin

Contractor: The Freshwater Trust

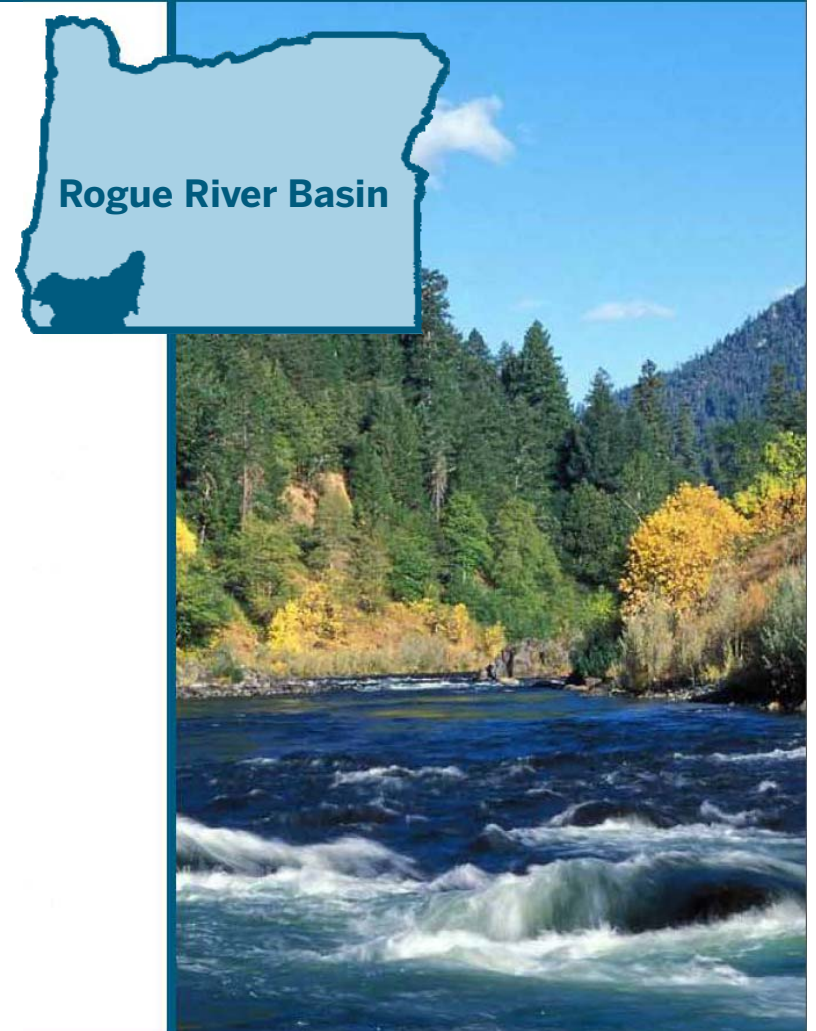
Driver: Projected excess heat under TMDL limits:
300 million kcals/day in 10 years

Options:

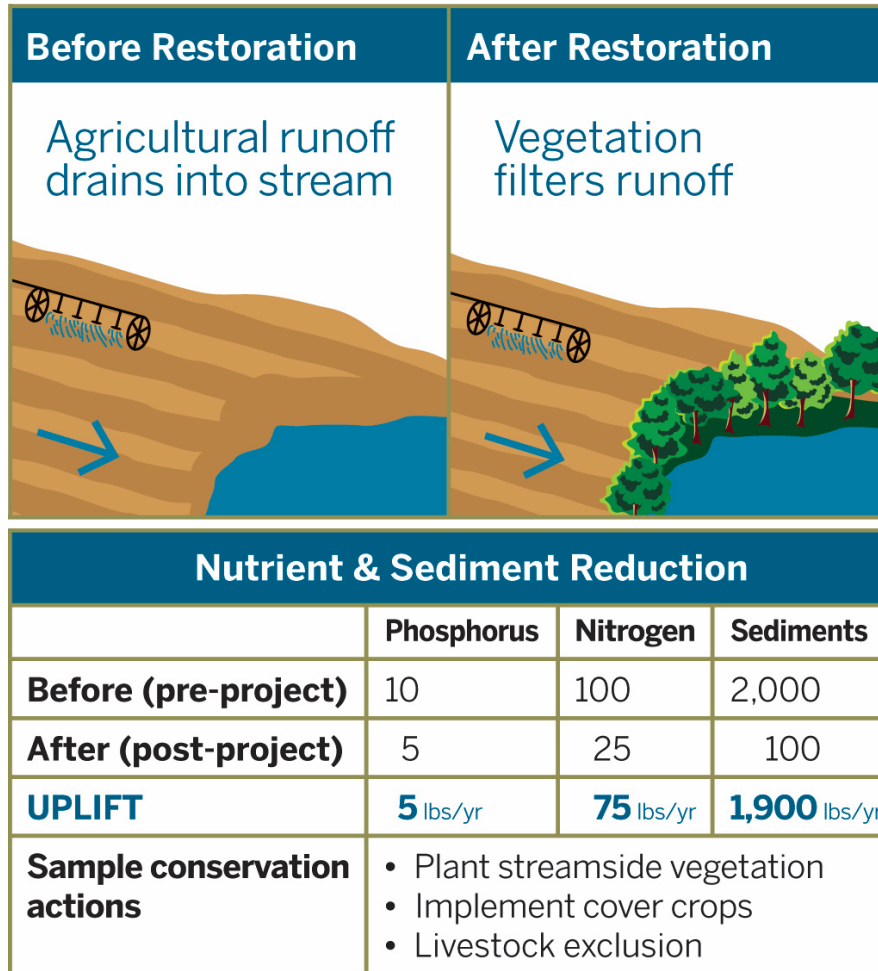
- Giant holding pond to store water for 1 month of each year: **\$16 million**
- 10-15 miles of native riparian vegetation restored and maintained for 20 years: **\$6.5 million**

With trading program for riparian revegetation:

- Money pays local restoration contractors
- Farmers get annual lease payments
- Restoration = 20 jobs per \$1 million spent
- Facility achieves compliance



Nutrient Model



- Nitrogen, phosphorus and sediment load reductions are modeled by comparing pre-project conditions of a field to modeled conditions after restoration or changed farm practices
- Assess impact of site-level restoration as a component of a basin-scale water quality problem

Case Study: Klamath Basin, OR

Buyer: PacifiCorp

Seller: 1 landowner

Contractor: The Freshwater Trust

Driver: Klamath Hydroelectric
Settlement Agreement

Goals of Pilot Project:

- ½ mile of livestock exclusion fencing to reduce phosphorus and sediment loading and reestablish riparian zone
- Part of a suite of regional actions to improve degraded water quality, support fish habitat and reduce algal blooms



Calculations & Quantification



- Modeling regulatory policy outcomes
- Permitting calculations & projections
- Natural alternatives to end of pipe
 - Program costs
 - Implementation & billing schedules
 - Logistics & supply chain
- Building compliance portfolios



Prioritization, Design & Contracting



- Program design and site prioritization
 - Local & ecological priorities
- Contracting leases with public & private owners
- Site design based on reference conditions, quality standards & best professional judgement



Degraded Conditions



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Riparian Planting



Project Implementation



Removing invasives



Planting natives



Calculating Credits: Example Ledger

Credit Type	Pre-project	Post-Restoration	Reduction
Temperature <i>(kCals/day)</i>	56,246,205	41,726,475	14,519,730
Phosphorus <i>(lbs/year)</i>	6	1	5
Nitrogen <i>(lbs/year)</i>	103	12	91
Sediment <i>(lbs/year)</i>	8,243	3,331	4,912



Monitoring: Performance & Transparency

Back Home Point 1 Event Detail Protocols

Little Butte RM 0.5 > Phase 1

Camera Point/Waypoint	Point 1
Bank	Left
Latitude/Longitude	44, 123
GPS Unit Type	Trimble
Physical Marker	Rebar
Notes	Camera point 1 captures the upstream end of the project site.

Photo Point	Direction /Azimuth	Previous Photo	New Photo
A	Downstream 12°		

View/Edit



Long-term monitoring:

- Plant survival
- Species diversity
- Invasive species cover
- Photo point monitoring

Ongoing maintenance:

- Invasive species control
- Plant replacement
- Irrigation where necessary

Verification & Registration



markit Financial Information Services

Registry - Public View

Clear Search: Registry: COTE: Willamette: Water Quality (Temperature) Standard All Units Page 1

Account Holders	Projects	Issuances / Listings	Holdings	Retired Credits
Olney Creek	Water Quality	COTE: Willamette: Water Quality (Temperature) Standard	Temperature	Active
	Biodiversity and Habitat	COTE: Willamette: Salmon Standard	Salmonid Habitat Protection	Active
Half Mile Lane	Water Quality	COTE: Willamette: Water Quality (Temperature) Standard	Temperature	Active
	Biodiversity and Habitat	Oregon Wetlands Regulatory (Ratios) Standard	Freshwater Wetland	Active
	Biodiversity and Habitat	COTE: Willamette: Wetland Habitat Standard	Freshwater Wetland	Active
	Biodiversity and Habitat	COTE: Willamette: Salmon Standard	Salmonid Habitat Protection	Active
	Biodiversity and Habitat	COTE: Willamette: Wetland Habitat Standard	Freshwater Wetland	Active
	Biodiversity and Habitat	Oregon Wetlands Regulatory (Ratios) Standard	Freshwater Wetland	Active
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Muhawk River Riparian Enhancement Project	Biodiversity and Habitat	COTE: Willamette: Salmon Standard	Salmonid Habitat Protection	Active
	Water Quality	COTE: Willamette: Water Quality (Temperature) Standard	Temperature	Active

Registry - Project Details

Sprague RM 43.5 (ID: 10300000007985)

Account Holder: The Freshwater Trust

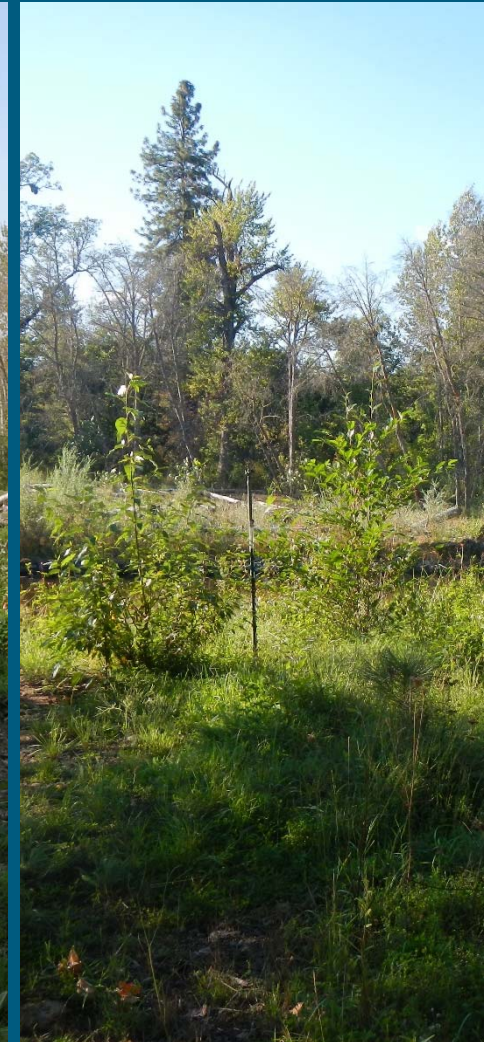
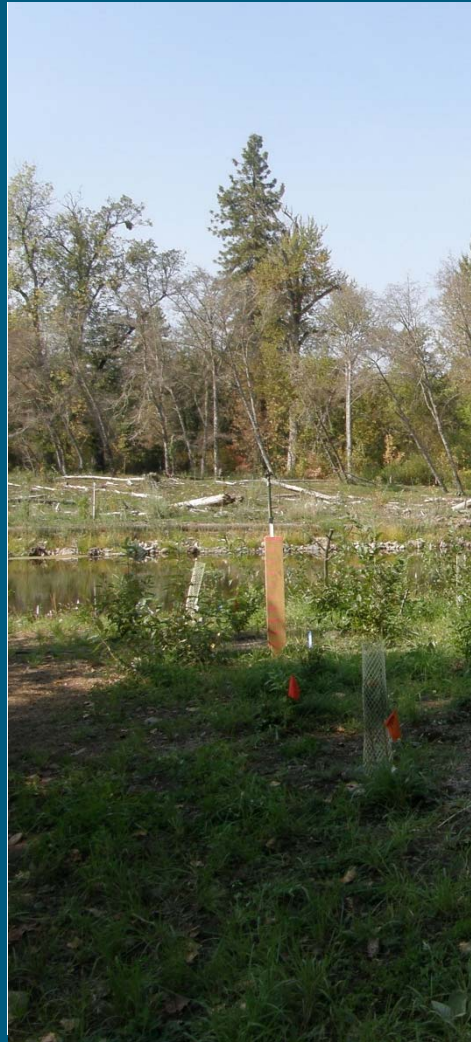
Description: The Freshwater Trust partnered with Harrah Bank Regional Trust to install fast a mile of riparian habitat along the north bank of the Sprague River in the Upper Klamath Lake drainage in Klamath County, Oregon. The riparian project was designed to reduce sediment, improve water quality and create riparian habitat and habitat for five years. The site will generate phosphorus credits by removing carbon from the Sprague River. The Freshwater Trust installed phosphorus credits using the highest quality soil tested in 2014. Superior quality levels include an increase in active plant cover and reductions in bank erosion.

Documents:

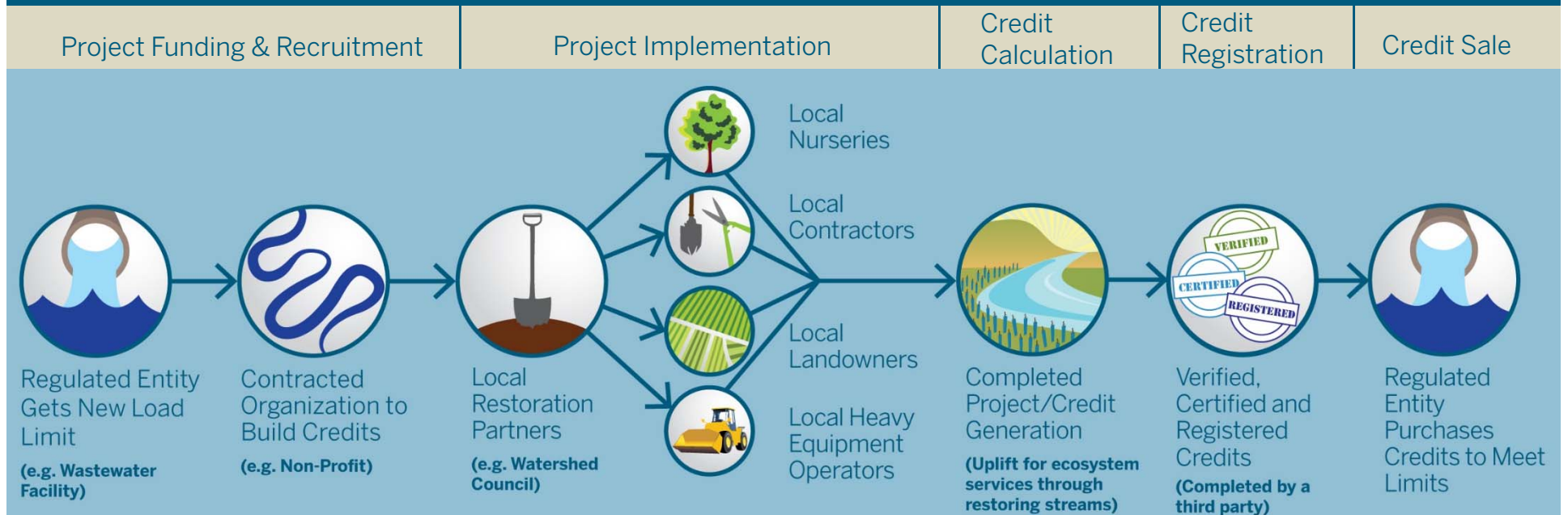
- COTE (WQ) Verification Report (29 Oct 2014-29 Oct 2019)
- COTE (WQ) ROD - Appendix (29 Oct 2014-29 Oct 2019)
- COTE (WQ) Project Plan (29 Oct 2014-29 Oct 2019)
- COTE (WQ) Service Area (Map) (29 Oct 2014-29 Oct 2019)
- COTE (WQ) Validator Report (29 Oct 2014-29 Oct 2019)
- COTE (WQ) Verification Report (29 Oct 2014-29 Oct 2019)

Category: Standard: COTE: Willamette: Water Quality (Temperature) Standard Project Type: Riparian Additional Certification: No Linked: [View](#)

Yearly Monitoring

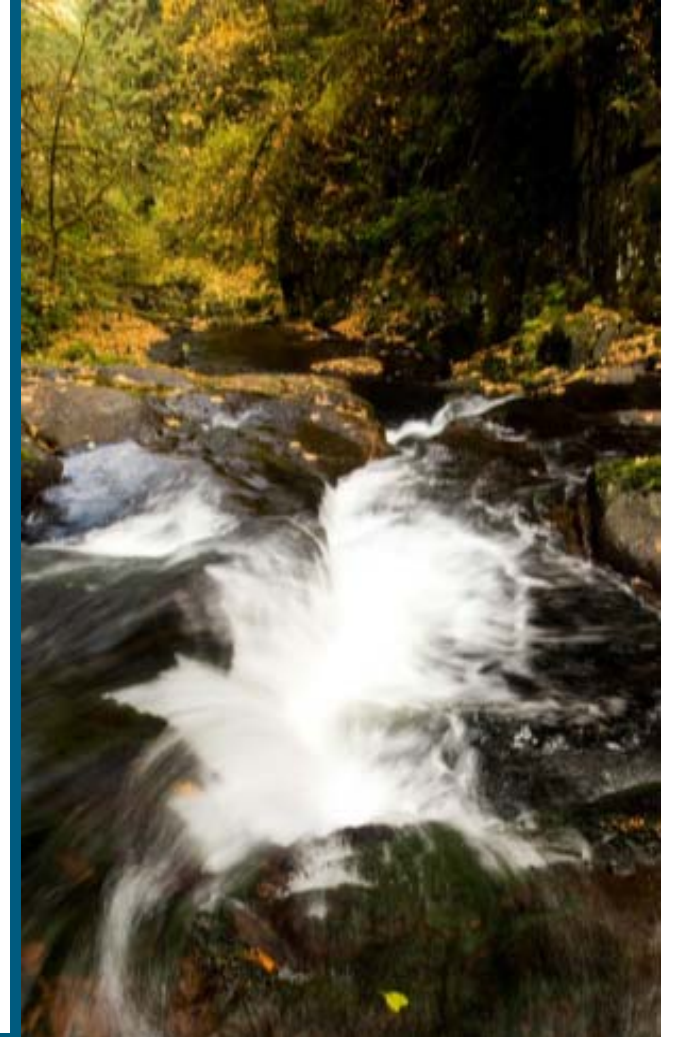


Transaction Process



4 Restoration Keys for Communities

- **Economic:** Restoration compliance generally far less expensive than technological solutions, spread over many years
- **Social:** Restoration keeps funding in the local community, creating jobs
- **Ecological:** The restoration solution converts point-source investment into non-point source projects, with multiple environmental benefits
- **Turn-key:** Cities only pay for certified credits



Resources

→ Uplift Report

Document: <http://www.thefreshwatertrust.org/2014-uplift-report/>

Video: <http://youtu.be/iXWnCOzjtAo>

→ Regional Recommendations

<http://willamettepartnership.org/success-stories/regional-recommendations-water-quality-trading/>

→ EPA Toolkit

<http://water.epa.gov/type/watersheds/trading/WQTToolkit.cfm>

→ National Water Quality Trading Alliance

<http://www.wqtalliance.com/>

→ National Network on Water Quality Trading

<http://willamettepartnership.org/national-network-on-water-quality-trading>

→ WEFTEC workshop, September 27, 2015

Quantifying Restoration for Clean Water Act Compliance: Common Ground for Water Quality Trading and Stormwater Management



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Questions?



Alex Johnson

Senior Freshwater Solutions Director

The Freshwater Trust

alex@thefreshwatertrust.org

503-222-9091 x18



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