



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

**A PRIMER ON EXISTING AND EMERGING MARKETS FOR ENVIRONMENTAL
OFF-SET CREDITS IN THE WILLAMETTE RIVER BASIN**

Wetlands mitigation banking	
Market driver	Section 404 fill permits from the Clean Water Act, and Section 10 of the Rivers and Harbors Act
Federal regulating agencies	US Army Corps of Engineers, US EPA
Oregon regulating agencies	Department of State Lands
Other involved agencies	US Fish and Wildlife Service, NOAA Fisheries, ODFW, and other members of the mitigation banking review team
Summary	<p>When a land developer fills or otherwise impacts a wetland they may buy offsets from a mitigation banker. The mitigation banker restores or creates an area of wetland (or multiple sites under an umbrella agreement) to generate credits.</p> <p>The number of credits generated by a restoration project is related to the area of wetland as well as the functional value of the wetland. In many instances the number of credits available for sale is less than the number of acres of restored. Further, a ratio is applied to the mitigation transaction typically in the range of one acre of impacted wetland to between one and three acres of restored wetland. Ratios increase to one to ten acres for wetland preservation projects that do not create or improve wetlands.</p> <p>A mitigation banker is responsible for establishing a wetland bank following financial and environmental guidelines before credits are released to the bank for subsequent sale. The Mitigation Banking Instrument which constitutes approval to build/preserve or enhance the wetland can take between 6 and 18 months to complete in some states, but can take considerably longer in some Army Corps districts.</p> <p>Mitigation is expected to take place before the impact on the wetland occurs, nonetheless credits are released to the bank sponsor over a period of a few years after the wetland is planned and authorized, and before 5 years of project monitoring concludes. In many instances up to 15 percent of the expected credits from a bank can be released before construction is complete.</p> <p>To secure the long-term success of the mitigation bank, a performance</p>

WILLAMETTE PARTNERSHIP
PACE, SCOPE, EFFECTIVENESS

	<p>bond and contingency security are required to cover construction and 5 year post construction monitoring of wetland quality and function. Long term management of the site must be guaranteed and endowed by the bank sponsor. Wetland mitigation credits must ensure that the wetland functions will be guaranteed to endure to perpetuity. The regulatory authority can exercise random audits and inspections of the compensation wetlands project (www.ecosystemmarketplace.net).</p> <p>US EPA has issued a new draft rule on compensatory mitigation that favors offsite mitigation and contains many elements favoring mitigation banking. The new rule will replace the existing EPA guidance issued in 1995. IN 2005, there were 31 states with active mitigation banks. From 1992 to 2005, the number of active banks grew from 46 to 330 banks (ELI 2005). More than 31% of all compensatory mitigation in the country is done by mitigation banks, representing one of the fastest growing ecosystem markets. The price of mitigation credits vary widely, ranging on the low end from \$3,000-\$15,000 per acre and on the high end from \$60,000-\$150,000 per acre (ELI 2005).</p>
OR buyers	Dept. of Transportation, Public Works Projects- including shovel-ready industrial lands, major corporations, commercial and residential real-estate developers. State Lands has identified the following areas as needing bank sites: Clackamas County-northwestern segment; Multnomah County-western segment; Jackson County - Medford area; Roseburg area; The entire Oregon coast.
OR sellers	Farmers, private bankers, land trusts. There are currently more than 8 operational private banks in the Willamette Valley.
OR potential	High: already active with growing demand along I-5 corridor and Washington County. First streambank mitigation bank in approval in 2006. State Lands is exploring the option of building a state clearinghouse (similar to the NC Ecosystem Enhancement Program) for wetland mitigation credits tied to industrial site development.

Endangered species conservation banking	
Market driver	Section 7 (consultations) and Section 10 (incidental take) of the Endangered Species Act
Federal regulating agencies	US Fish and Wildlife Service, National Marine Fisheries Service
Oregon regulating agencies	Not determined
Other involved agencies	Future members of the conservation banking review team.
Summary	The US conservation banking market is a biodiversity offset system that allows for the sales and purchase of endangered species credits to offset

WILLAMETTE PARTNERSHIP
PACE, SCOPE, EFFECTIVENESS

	<p>negative impacts to endangered species and their habitat. Banks are created by permanently protecting endangered species habitat on private land. Conservation banking was pioneered in the state of California and is becoming increasingly popular in other states since the passage of federal guideline of their establishment, use, and operation in 2003 (www.ecosystemmarketplace.net).</p> <p>A bank can be created in a number of different ways: (1) acquisition of existing habitat; (2) protection of existing habitat through conservation easements; (3) restoration or enhancements of disturbed habitat; (4) creation of new habitat in some situations; and (5) prescriptive management of habitats for specified biological characteristics.</p> <p>USFWS and NMFS are each responsible for conservation banking for their species. NMFS has approved a salmon bank in California, and USFWS has just approved the first two bank sites in Oregon for Oregon chub. USFWS is currently developing conservation banking policy for Oregon and initial public review drafts should be available for review in late 2006, early 2007.</p> <p>As of 2005, there were 76 properties in 10 states identified as conservation banks, 35 of which were under conservation banking agreements with the USFWS (Fox and Nino-Murcia 2005). Credit prices range from \$3,000 to \$125,000 per acre and 91% are breaking even or making money. On average, banking agreements took 2.18 years to establish, and there is still a lot of uncertainty surrounding the rules and practices for conservation banking.</p>
OR buyers	Dept. of Transportation, Public Works Projects, major corporations, commercial and residential real-estate developers
OR sellers	Farmers, private bankers, land trusts
OR potential	Medium: USFWS has approved the first to conservation banks for OR chub for the Dept. of Transportation. There is still no formal process for conservation bank approval. There are no standards for anadromous fish banking. The recovery plans for the Willamette Basin species will enhance banking. There is also a need to authorize low impact incidental take permits as an additional driver of banking in OR.

Water quality trading	
Market driver	NPDES permits, TMDLs, and MS4 permits
Federal regulating agencies	US EPA
Oregon regulating agencies	Dept. of Environmental Quality

WILLAMETTE PARTNERSHIP
PACE, SCOPE, EFFECTIVENESS

Other involved agencies	
Summary	<p>Most water quality markets are established to assist industrial and municipal waste water dischargers that must reduce the amount of pollutants they release to natural. Trading allows polluters with high costs of pollutant reduction to contract with other entities with lower cost of reduction to meet their pollutant reduction requirements.</p> <p>Credits can be purchased from other industrial dischargers that have lower cost for pollutant reduction or unregulated land-based pollutant sources such as farmers. In most cases the liability for reducing pollutant loading resides with the permitted discharger even after the trade has been approved. Bilateral contracting mechanisms may mitigate some of the risk in these transactions.</p> <p>Pollutant trading programs are most commonly established for water bodies that do not meet water quality standards. US EPA requires most states to develop pollutant control strategies, known as Total Maximum Daily Loads or TMDLs, for these impaired waters. A TMDL determines the daily, seasonal or annual maximum amount of a particular pollutant that a water body may receive and still meet the required pollutant limits for that water body. Once a TMDL is established regulators must tighten pollutant discharge restrictions to reduce pollutant loads. Pollutant trading programs are looked to as the way to minimize the cost of achieving water quality goals in these impaired waters (www.ecosystemmarketplace.net).</p> <p>In 2005, there 39 water quality trading programs around the country. Many of these are not actively trading due to lack of demand for credits. State water quality agencies and publicly operated treatment works play an important role in launched trading programs, but local coalitions have launched some of the most successful programs. Most programs trade in nutrients, but there are trading programs for temperature, heavy metals, total dissolved solids, selenium, sediment, and flow. Markets are set up as bilateral agreements, brokered trades, and clearinghouses. Trading ratios range from 3:1 to 1:1, with most point/point trades getting a 1:1 ration and most point/nonpoint trades a 2:1 ratio.</p> <p>The three biggest obstacles to trading are thin markets with little demand, no regulatory driver, and early problems with negotiation and conflict.</p>
OR buyers	NPDES permit holders
OR sellers	POTWs, farmers
OR potential	High: already active in the Tualatin Basin with grant monies in place to expand temperature trading in the Willamette. There is a need to authorize trading for other constituents like phosphorous, dissolved oxygen, and

WILLAMETTE PARTNERSHIP
PACE, SCOPE, EFFECTIVENESS

	bacteria.
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Air quality trading	
Market driver	Kyoto protocol, state emissions standards, federal acid rain programs
Federal regulating agencies	US EPA, Dept. of Energy maintains a registry
Oregon regulating agencies	OR Dept. of Environmental Quality, OR Dept. of Energy
Other involved agencies	
Summary	<p>In 1997 Oregon became the first state in the nation to adopt legislation regulating greenhouse gases. The law requires new Oregon power plants (and other large energy facilities) to offset a significant portion of their carbon dioxide emissions. While emitters may choose to offset the emissions through their own investments, all of the regulated power plants to date have utilized the Oregon Climate Trust to achieve compliance. As of 2006, the Climate trust had invested \$4 million in energy efficiency, renewable energy, sequestration, transportation efficiency, cogeneration, and material substitution projects. The three funding sequestration projects include forest on tribal lands in Washington, along the Deschutes River, and in Equador.</p> <p>Voluntary carbon trading schemes have also emerged in the United States. The Chicago Climate Exchange (CCX) is a pilot greenhouse gas (GHG) cap-and-trade program running from 2003 to 2006. The 24 Members of the CCX have made a voluntary, legally-binding commitment to reduce their emissions of greenhouse gases (CO₂, CH₄, N₂O, PFCs, HFCs, SF₆) by four percent below the average of their 1998-2001 emissions baseline by 2006 (www.ecosystemmarketplace.net). Many of the current offset projects come from Midwest agricultural soil carbon offsets. Other projects include forestry, agricultural methane, landfill methane, and renewable energy. Offsets have been purchased in Washington and California, but none in Oregon.</p> <p>Other air quality markets exist under EPA's Acid Rain Program (1990), Clean Air Interstate Rule (2005), and Clean Air Mercury Rule (2005). State and regional programs such as the Regional Greenhouse Gas Initiative in the Northeast, Emissions Reduction Market System in Illinois, and a program in Houston have also grown. Currently, OR does not allow emissions trading for other emissions beyond those of new power plants. California is working on a climate change registry, and has recently developed an agreement to trade carbon credits with the British government. New standards shared by California, Oregon, and Washington could create new opportunities for greenhouse gas markets.</p>

WILLAMETTE PARTNERSHIP
PACE, SCOPE, EFFECTIVENESS

OR buyers	Power utilities, businesses, private individual offsetters
OR sellers	Forest landowners, riparian forest restoration projects
OR potential	High: already active through the Oregon climate trust. The Chicago Climate Exchange has not bought any carbon from Oregon yet. There is a need to connect carbon markets with other ecosystem goals.

Water supply trading	
Market driver	Water quality goals under the Clean Water Act, Endangered Species Act, other water supply needs
Federal regulating agencies	
Oregon regulating agencies	Dept. of Water Resources
Other involved agencies	
Summary	<p>Most water quantity trades have involved urban water users leasing water from agricultural water rights holders in the Western United States. California, the Columbia Basin, and the Great Lakes have increased trading for environmental purposes in recent years. Flows are also getting attention related to meeting water quality goals and stormwater discharge requirements.</p> <p>In many places, the property rights for water are established, but there is less experience in the legalities of transfers and environmental uses. The Deschutes Basin has seen some of the most active trading in water supply in an effort to restore natural flows. The Deschutes Water Alliance has created a Water Bank, which allows for temporary lease of unused water for instream flow, development of a groundwater mitigation bank, and water reserves.</p> <p>The Oregon Water Trust acquires, purchases, and develops agreement to provide water in-stream. Large portions of their funds come from Bonneville Power Administration.</p>
OR buyers	POTWs, state agencies, municipal water suppliers, new farmers, environmental groups
OR sellers	Farmers, irrigation districts
OR potential	High: already active throughout the country. Trading for environmental purposes has been facilitated by the OR Water Trust. Property rights are already well established. There is a need to expand the drivers for environmental trading and to link water quantity more closely with water quality goals.

Transferable development rights	
Market driver	Local zoning

WILLAMETTE PARTNERSHIP
PACE, SCOPE, EFFECTIVENESS

Federal regulating agencies	
Oregon regulating agencies	Local governments, Metro
Other involved agencies	
Summary	<p>Transferable development rights are a tool to make zoning rules more equitable and predictable. They separate the development rights from the land and other bundles of property rights. In a local comprehensive plan, areas are designated as “sending areas”, or those places where low density or conservation are desired. These areas are given tradable credits that they can sell to “receiving areas” where higher density development is demanded by the market or required by local government.</p> <p>Transferable development rights has its roots in New York City’s 1916 zoning law capping the height of buildings, but allowing skyscrapers to purchase air rights from adjacent open space. Some of the successful TDR programs include King County, WA, The Pinelands, New Jersey, Boulder County, Colorado, and Montgomery County, Maryland. As of 2005, the King County program had protected 143 square miles of land.</p> <p>In King County, a sending site might expect to receive between \$10,000 and \$24,500 for their development right. A sending site must be placed in a conservation easement before transfers can occur. The land must be unincorporated. Credits can be sold directly to buyers or a “TDR Bank” operated by the County to purchase high priority credits. The Bank was capitalized with \$1.5 million from the County in 1999. Receiving sites can be: Unincorporated King County urban areas zoned R-4 through R-48, NB, CB, RB, or O; Incorporated cities where allowed by the local jurisdiction; Some rural areas zoned RA-2.5.</p> <p>A version of transferable development rights might be used in association with new lands coming into the urban growth boundary and with Goal 5 implementation.</p>
OR buyers	Developers in high density areas
OR sellers	Landowners in low density areas
OR potential	Medium: already active in Washington, but is likely to run into obstacles in OR’s current land use planning environment. There is an opportunity to incorporate trading into the Big Look or at a smaller scale for the Bethany or Damascus UGB expansions.

Renewable energy trading	
Market driver	Large capital management firms wanting to “green” portfolios
Federal regulating	

WILLAMETTE PARTNERSHIP
PACE, SCOPE, EFFECTIVENESS

agencies	
Oregon regulating agencies	
Other involved agencies	
Summary	Large capital investment firms and energy companies purchase renewable energy credits from those providers to offset other investments.
OR buyers	
OR sellers	
OR potential	?

POTENTIAL MARKETS

Green certification habitat markets	
Market driver	Green certification requirements
Federal regulating agencies	
Oregon regulating agencies	
Other involved agencies	
Summary	Many of the green certification programs for food and timber products, such as Food Alliance and others, include provisions for fish and wildlife habitat as a condition for certifying products. There is interest and potential here for allowing farmers and foresters to purchase habitat offsets from banks or other farmers to meet certification requirements.
OR buyers	Farm and forest owners
OR sellers	Farmers, foresters, private bankers, land trusts
OR potential	Medium: Certification rules already ask for habitat, but there is no system in place for authorizing trading. Certification programs are supportive of the offset idea. Farmers are getting certified now based on current activities, so there may not be enough of an incentive to trade.

Stormwater Trading	
Market driver	Local regulations, MS4 permit, Clean Water Act
Federal regulating agencies	US EPA
Oregon regulating agencies	Dept. of Environmental Quality
Other involved	Municipal governments, special districts

WILLAMETTE PARTNERSHIP
PACE, SCOPE, EFFECTIVENESS

agencies	
Summary	<p>The City of Portland is conducting a stormwater trading feasibility study. They cannot trade directly within the bounds of their MS4 permit. They are using a local ordinance focusing on flows as a driver for trade. The Portland program is also tied to its Combined Sewer Outflow issues.</p> <p>Trading might occur around impervious pavement, where a green street installation might create credits that could be traded to developers in the same watershed.</p>
OR buyers	Cities, developers, and other stormwater dischargers
OR sellers	Private residences, farms, developers, cities
OR potential	Low: Even though Portland may be creating the first stormwater trading program, it may be unique to Portland. The regulatory drivers are not very clear and a lot of work with DEQ and EPA would need to be done to make room for trading.

Tradable recreation permits	
Market driver	Capped supply of recreation permits for fishing, hunting, and other activities
Federal regulating agencies	
Oregon regulating agencies	
Other involved agencies	
Summary	Could cap the number of permits and trade them. This runs counter to many current systems of a lottery, which keeps prices affordable. Could also involve a payment scheme that would pay private or public landowners to provide recreational opportunities.
OR buyers	Recreationists
OR sellers	Private landowners, public agencies
OR potential	Low: Given the political support for current lottery systems and the desire to keep fees for using public lands low, recreation permits are not highly feasible on public lands. However, there is more potential for private landowners looking to provide recreational opportunities, which would require coordination with state agencies who manage public land and wildlife resources.

Natural resource damage assessments	
Market driver	CERCLA, Oil Pollution Act, Clean Water Act
Federal regulating	US EPA, USDA, NOAA Fisheries, Dept of Defense, Dept. of Energy,

WILLAMETTE PARTNERSHIP
PACE, SCOPE, EFFECTIVENESS

agencies	Dept of Interior
Oregon regulating agencies	Dept. of Fish and Wildlife, Dept. of Environmental Quality
Other involved agencies	Tribes
Summary	<p>Injuries to natural resources from oil spills or other pollutant releases are assessed, and appropriate restoration projects are identified in contemplation of negotiated settlements or legal actions (in rare cases) with potentially responsible parties. Recoveries, in cash or in-kind services, from the potentially responsible parties are then used to finance or implement the restoration of the injured resources, pursuant to a publicly reviewed restoration plan.</p> <p>The federal trustees listed above are responsible for managing damage assessment programs for the resources they manage. State and tribal trustees can also be designated.</p> <p>It is feasible that NRDA damages could be offset by the purchase of restoration credits, but there is limited ability to create credits in advance of spills. Federal trustees have talked about creating regional restoration plans, which could be designated from existing plans.</p> <p>DEQ maintains a database of contaminated sites, but it seems like the only feasible opportunities in the short term relate to the cleanup of the GASCO and T4 Slips at the Port of Portland. NOAA is the lead trustee on these projects.</p>
OR buyers	Polluting corporations, government agencies
OR sellers	Farmers, foresters, private bankers, land trusts
OR potential	High: There is already a system in place to generate funding from potential buyers. Trustee agencies would just need to adopt the practice of buying credits rather than using in-lieu fees. This market could generate funding from Portland's port facilities for upstream restoration projects.

Flood hazard mitigation	
Market driver	Flood insurance, others?
Federal regulating agencies	US Army Corps of Engineers, FEMA
Oregon regulating agencies	
Other involved agencies	Local governments and flood management agencies
Summary	FEMA requires flood insurance for those landowners located within the 100-yr floodplain. Several states have also limited growth in these

WILLAMETTE PARTNERSHIP
PACE, SCOPE, EFFECTIVENESS

	<p>floodplains.</p> <p>New Jersey has a rule that says any new development in several flood-prone basins must have no net increase in peak flow runoff. Under the program they are allowed to buy fill credits. The fill credits were generated by using former gravel pits as flood hazard mitigation.</p> <p>The Community Rating System under FEMA's National Flood Insurance Program can reduce premium payments for communities where flood hazard mitigation has been completed.</p>
OR buyers	Developers
OR sellers	Park developers, private landowners
OR potential	?

Pollinator habitat	
Market driver	Need for food crop pollination
Federal regulating agencies	
Oregon regulating agencies	
Other involved agencies	
Summary	<p>Farmers spend millions of dollars annually to lease bees and other pollinators to support fruit, nut, and other crops reliant on pollination. The services provided by native pollinators have moved on as suitable habitat has also disappeared.</p> <p>It is feasible that farmers associations, conservation districts, fruit packing companies, or others could sponsor a voluntary market for purchasing pollinator habitat enhancement. Farmers with significant habitat and/or central locations could sell credits to their neighbors for the pollination services provided by insects on that habitat.</p>
OR buyers	Farmers
OR sellers	Farmers, foresters, land trusts, other owners of habitat
OR potential	Unknown: There is clearly a link between pollinators and economic production for crops like fruit and nuts. There is not a mechanism in place to pay people for pollinator habitat, but it may not be hard to design. Many farmers know how much they spend to rent bees, which could indicate the potential market size for pollinator habitat.