
Ecosystem Service Markets

1. Organizing Questions

Forests provide a range of services (timber, clean water, wildlife habitat, carbon storage, clean air, recreation, etc.), but forest landowners only have a financial incentive to focus on a few of those services, mainly timber.

This brief asks the following questions:

- What are the funding streams and markets available that can pay landowners for services aside from timber?
- How could these funding streams and markets support land acquisition, habitat restoration, enhanced protections for habitat, or other increased conservation benefits for the Marbled Murrelet?
- How could these funding streams and markets increase revenues to the trusts while at the same time benefiting Marbled Murrelets, timber jobs, and timber volume?

2. Background and Context

Funding streams, financial incentives, and markets that enable landowners to protect or enhance ecosystem services are sometimes called Ecosystem Service Markets.¹ These approaches offer a potential win-win: landowners are better off because they're receiving financial compensation, and ecosystems are better off because landowners are conserving, acquiring, or managing more land for a diverse range ecosystem service outcomes.

In Washington State, there are a range of Ecosystem Service Market programs, some of which could have relevance to the Marbled Murrelet. Examples include:

Carbon markets. Forest landowners in Washington have engaged in several significant carbon market transactions in recent years. In 2016, Microsoft purchased 35,000 carbon credits from the Nisqually Land Trust in exchange for the land trust committing to store more carbon for 100 years on a 520-acre forested property.² The price was not publicly disclosed, but assuming prices in the range of \$8-12 per credit, the landowner payment would be \$300,000 to \$400,000, or approximately \$500-800 per acre. In 2016, the Confederated Tribes of the Colville Reservation registered a much larger project – more than 11 million carbon credits – which they have since entered into a contract to sell to British Petroleum

¹ <https://www.fs.fed.us/pnw/science/scifi144.pdf>

² <https://www.seattletimes.com/seattle-news/environment/microsoft-buys-carbon-credits-in-forest-near-rainier-to-offset-pollution/>

over five years.³ Assuming a price in the \$5-8 range per credit, given the larger scale of the transaction, Colville Tribes could see revenue of \$50-80 million or more for their 490,000 acre project. Other project examples include an approximately 10,000 acre forest carbon project for 850,000 credits on private timberlands in southwest Washington, and a 500-acre project developed by Ecotrust on the Olympic Peninsula. In addition to these projects, some smaller payments have taken place with small forest landowners and urban forests.

Mitigation banking. Mitigation banking is a method of compensating for unavoidable impacts to natural resources from highways, buildings and other construction and development projects. Banks can receive payments from projects and use those funds to pay for conservation or restoration projects near or adjacent to projects. One example in southwest Washington is the Coweeman Mitigation Bank, which is near Longview on the Coweeman River.⁴ The 302-acre bank offers credits to offset impacts from highways and other projects to wetlands and salmon in portions of the Coweeman, Cowlitz, and Toutle River watersheds. Similarly, the 230-acre North Fork Newaukum Wetland Mitigation Bank in Lewis County offers offsets for highway impacts to wetlands in the I-5 corridor.⁵ The Newaukum project generated about 78 credits, which means the project can compensate for the loss of 78 acres of a typical Category II wetland. Credits can sell for more than \$200,000 each.

Transfer of development rights. Transfer of Development Rights is a land conservation mechanism in which an urban developer pays a landowner to conserve their farm or forest in exchange for the ability of that developer to construct additional units in an urban area. King County's TDR program is one of the largest and most successful in the country. From 2000 to 2017, more than 1,000 TDRs were sold for a total value of \$26 million, providing conservation funding across more than 140,000 acres.⁶ Other counties in the state, such as Thurston and Pierce, have programs as well but have transacted much smaller dollar and acreage amounts.

Other approaches. Other payment or market approaches that have been discussed or implemented in Washington include water quality trading, water rights trading or buy-backs, conservation tax incentives, and small landowner cost-share payments.

3. Potential Opportunities

Ecosystem markets could support increased revenue to trust beneficiaries by funding transactions in which DNR acquires new properties. Potential opportunities to use the example markets listed above include:

³ https://www.bp.com/en_us/bp-us/media-room/press-releases/bp-the-colville-reservation-tribes-and-finite-carbon-reach-milestone.html

⁴ <https://ecology.wa.gov/Water-Shorelines/Wetlands/Mitigation/Wetland-mitigation-banking/Mitigation-bank-projects/Coweeman-River>

⁵ <https://ecology.wa.gov/Water-Shorelines/Wetlands/Mitigation/Wetland-mitigation-banking/Mitigation-bank-projects/North-Fork-Newaukum>

⁶ <https://www.kingcounty.gov/services/environment/stewardship/sustainable-building/transfer-development-rights/market-info/sales-data.aspx>

‘Avoided conversion’ carbon funding for acquisition. One type of carbon project is ‘avoided conversion.’ The carbon benefit comes from conserving forestland in an area that is urbanizing under high development pressure. Let’s assume that we could find 1,000 acres of good quality timberland in Western Washington that is privately owned by a willing seller and also under high development pressure. The project would quantify the loss of carbon from the forest if the forest was converted to development. This quantity would become the approximate number of carbon credits from the transaction. The property would be sold to DNR as replacement land to manage, and the sale of the avoided conversion carbon credits would help fund this acquisition. For round numbers, let’s assume the project would generate 50 credits per acre and would sell those credits at \$10 each. This would generate \$500K which could be applied toward a land transaction of, say, \$5-10M, assuming total acquisition costs of \$5-10K per acre. Additional funding would be needed to cover the bulk of the purchase.

‘Improved forest management’ carbon funding for acquisition. Another type of carbon project is Improved Forest Management (IFM) in which a landowner shifts their method of harvest to store more carbon in the forest and receives a payment for the carbon credits generated. The examples provided above under ‘carbon markets’ are all IFM projects. It is unclear whether DNR could conduct an IFM project on acreage identified as Marbled Murrelet habitat because a project depends on storing more than a legal requirement, and protection of Murrelet habitat may or may not qualify as such a requirement under various carbon offset protocols. If a project did move forward, it might look something like this. DNR calculates the additional carbon stored on 20,000 acres. Let’s assume that initial additional storage is 20 credits per acre. At \$10 per credit, this could be sold for \$4M, which DNR could then use in a separate transaction to help purchase replacement lands to manage for beneficiaries. Similar to Scenario 1, additional funding would be needed to cover the bulk of replacement lands purchases.

TDR funding for acquisition. Transfer of development rights markets require local zoning ordinances to establish the terms for buying and selling development rights. The markets are driven by demand for development that exceeds the zoning capacity in a jurisdiction. Here’s how a TDR transaction might support Marbled Murrelet recovery and revenue to trust beneficiaries. A city like Vancouver, Longview, or Olympia would pass a zoning ordinance that allows developers to build additional units and buildings in exchange for providing funding for forest land conservation. The developer would purchase TDRs, which would generate funding that would be provided to support DNR in acquiring replacement lands for the trust. In King County, the average price for a TDR has been about \$20K. Depending on the type of land (farmland, forestland, rural residential, etc) one TDR might cover anywhere from 5 to 80 acres of land. Let’s assume DNR identifies 8,000 acres of replacement trust land from a willing seller, which is zoned at 80 acres per unit. This would mean the property would have 100 development rights. Developers would purchase the 100 TDRs for approximately \$20,000 each, generating \$2M that DNR would use to help fund the acquisition of the 8,000 acres.

Mitigation banking is not included in this list of scenarios. These banks are driven by requirements that highways, buildings, and other developments mitigate for unavoidable damage to wetlands and habitat.

The mitigation projects that result restore habitat and ecosystem function for species and ecosystems distinct from the Marbled Murrelet.

4. Challenges/Uncertainties

Small scale. Compared to the multi-billion dollar timber market in Washington, ecosystem service markets in Washington are still relatively small-scale. The Colville carbon project is a notable exception. Wetland mitigation banking in particular involves site-specific features, such as wetland soils, that make market opportunities only available in certain locations.

Weak demand. Ecosystem markets currently have challenges with weak or inconsistent demand. For transfer of development rights to function, urban jurisdictions must have strong demand for new construction, and the political will to channel that strong demand into requirements to purchase development rights. TDR markets have been set up in a number of jurisdictions around the state, but King County has been by far the most successful, in part because of its strong real estate market and the decision by Seattle and other jurisdictions to pass TDR zoning ordinances. Similarly, while some forest carbon transactions have shown success, and some forecasts show increasing demand and prices, the current demand for voluntary and compliance carbon offsets means modest prices compared to established timber markets.

Additionality. A key principle of ecosystem markets is ‘additionality,’ which means that the purchase of credits for wetlands, carbon storage, water quality, or other services is truly additional to what would have occurred in the absence of the transaction. For instance, if a company has unavoidable carbon emissions from their diesel truck fleet, and they want to purchase offsets to reduce their carbon footprint, they need to know that the emissions reduction they are funding is additional. In order to know this, ecosystem markets must have systems for verifying that offsets are real, additional, quantifiable, verifiable, and enforceable. Some offset rules also require that offsets are permanent. All of these features are expensive and add to the challenge and complexity of completing transactions.

Limited viable parcels. Successful avoided conversion forest carbon projects depend on finding properties with the right combination of features including high development pressure, good timber growing potential, appropriate acreage, and a willing seller. This set of constraints means that there may be limited parcels available for transactions. Similarly, mitigation banking is only viable in certain areas.

Need for other funds. The TDR and carbon transaction examples listed above all would require some additional source of funding to close a transaction. Depending on the parcels involved, and assuming current prices, TDR or carbon project funding may cover less than half the purchase price in a transaction. This means that successful transactions will face the dual challenge of closing a complex carbon or TDR deal while also securing significant alternative sources of funds.

5. Potential Next Steps

Research & Data Analysis

Avoided conversion carbon. Research the feasibility of conducting an avoided conversion forest carbon offset project that could help fund the acquisition of replacement trust lands. Conduct a GIS analysis of

feasible parcels that could meet criteria of high development pressure, good timber growing potential, and large enough acreage to cover transaction costs. Research the various carbon protocols (CAR, VCS, ACR, etc) for the specific requirements of an avoided conversion project. Consider working with a carbon project developer to assess feasibility.

Forest management carbon. Research the feasibility of conducting an improved forest management forest carbon offset project that could generate funds for trust beneficiaries and/or funds for acquisition of replacement trust lands. Research the various carbon protocols (CAR, VCS, ACR, etc) for the specific requirements of IFM projects, paying particular attention to protocols that may provide additional flexibility for a public entity like DNR to conduct a project. Consider working with a carbon project developer to assess feasibility.

Relationship to Other Funding. Look into how carbon market funding could complement other acquisition financing opportunities such as appropriations from the legislature, DNR's land bank funds, timber revenue, private donations, federal grants, or other finance and funding tools.