AN OREGON ECOSYSTEM MARKETPLACE:

Opportunities and Limitations

Gina LaRocco and Sara Vickerman

Defenders of Wildlife

February 2007

DEFENDERS OF WILDLIFE

Defenders of Wildlife is a national nonprofit membership organization dedicated to the protection of all native animals and plants in their natural communities.

ACKOWLEDGMENT

We wish to thank the
USDA Forest Service, Pacific Northwest Research Station
whose generous support made this report possible.

AUTHORS
Gina LaRocco, Defenders of Wildlife
Sara Vickerman, Defenders of Wildlife

DESIGN & PRODUCTION
Kassandra Kelly, Defenders of Wildlife

Northwest Office
1880 Willamette Falls Drive
Suite 200
West Linn, Oregon 97068
503-697-3222

This document may be viewed and accessed at:
www.biodiversitypartners.org

Cover photographs by Bruce Taylor. Left: Crooked River colors. Right: Oak trees, Mary's River.

AN OREGON ECOSYSTEM MARKETPLACE:

Opportunities and Limitations

DEFENDERS OF WILDLIFE
West Linn, Oregon • Washington D.C.

TABLE OF CONTENTS

I. INTRODUCTION

Over the last thirty years, landmark environmental laws have addressed some of the most visible and egregious sources of environmental degradation, but have focused primarily on specific impacts and individual species and habitats. In particular, legal requirements have typically steered mitigation toward on-site locations because it was viewed as the most economically and ecologically appropriate means to offset development impacts. However, it has become increasingly apparent that on-site mitigation does not always present the best approach because site-by-site mitigation can be quite costly, sites are too small and near developed areas and development is often completed long before anyone can determine the success or failure of the mitigation effort. Also, while treating isolated problems can improve specific issues, such an approach fails to consider the overall health of the natural environment.

This realization has lead to energized discussions regarding the use of market-based tools to provide a more economically and ecologically effective approach to offsetting development impacts and improving conservation efforts in Oregon. There has been a general recognition that it would be more effective and efficient to integrate ecosystem elements (e.g., species, habitat, water quality, etc.) within a mitigation bank site rather than keep them separate. Under an ideal integrated system, mitigation work could be financed by selling credits to developers and others with regulatory responsibilities to mitigate damage caused by development or discharges. Since ecosystems provide "services," such as clean water and habitat, the notion of bundling payments for ecosystem services is often discussed as a strategy for engaging the private sector in land conservation and restoration at a scale that will be effective.

In Oregon, the Willamette Partnership, a nonprofit organization dedicated to increasing the pace, scope, and effectiveness of conservation in the Willamette Basin, has been playing a key role in defining and implementing these concepts. In early 2006, the Partnership was awarded a grant from the U.S. Environmental Protection Agency to execute a water quality trade in the Willamette Basin within two years, and propose an institutional mechanism for a "multi-credit ecosystem marketplace" where trades for different types of ecosystem services could be centralized and financial incentives for voluntary restoration could be created. There also have been discussions about creating a pilot project in the Willamette Basin that could illustrate and test the concept of a multi-credit bank and trade.

The pilot project could give agencies, developers, policymakers and other interested parties the opportunity to determine how a

multi-credit trading system could work, and provide an opportunity for practitioners to address any outstanding issues. One element of the pilot will be a project of a significant size within the Willamette Basin, in a priority location, that includes more than one type of credit (e.g., temperature, wetland, endangered species, carbon) and potentially other revenue sources. The pilot project can also begin to define and implement the key institutional elements in an ecosystem marketplace, including defining the rules, roles and responsibilities of the buyers and sellers, and developing mechanisms for strategic investments.

As a result of this momentum, it is necessary to identify the opportunities that exist within the state to help further marketplace development, as well as any limitations that could hinder effective implementation. Therefore, the purpose of this paper is to identify the primary statutory and institutional limitations to the creation of an ecosystem marketplace in Oregon. It is important to keep in mind that the limitations identified in this paper are to help practitioners recognize the issues that need to be addressed in developing such a concept, not to provide an exhaustive assessment of federal and state agencies laws and policies. Ultimately, identifying the limitations will help avoid implementation problems later.

II. BRIEF SUMMARY

Currently in Oregon, no statutes or regulations exist that explicitly prevent the development of a multi-credit ecosystem marketplace. However, there are some laws in place that could affect an agency's participation (buyer, seller, multi-credit bank owner, etc.) in a market system. While these present potential disruptions to the flow of a marketplace, there are still ways to overcome these limitations, ranging from adjusting an agency's role in the market (bank owner vs. credit buyer)[1] to legally removing them.

Rather, the major limitation associated with the development of a multi-credit ecosystem marketplace deals with overcoming institutional and political concerns. In particular, some of the relevant agencies are resistant to or skeptical of the notion of a multi-credit system. Yet it is challenging to address this resistance and skepticism since a multi-credit ecosystem marketplace lacks successful precedent.

One way to help alleviate these issues may be the development of a pilot project, showing how multiple credits can be generated from a single mitigation bank site and then subsequently bought and sold in a market-like system. Such a project could provide skeptics with the opportunity to address concerns, demonstrate value and see firsthand how a multi-credit system could work on-the-ground. Other concerns, however, may need to be directly addressed in legislation or an executive order.

[1] Bank owner refers to the person or entity who owns the land that is generating credits, while a credit buyer refers to the regulated or non-regulated person or entity who needs or wants to mitigate development impacts.

III. ANALYSIS

The following analysis will provide context to the terms that are often used in discussing an ecosystem marketplace, some background on how this concept has gained attention in Oregon, particularly in the Willamette Basin, a synopsis of opportunities that make implementation feasible, and a summary of the limitations that could hinder implementation if they are not adequately addressed.

TERMINOLOGY

For purposes of this paper, terms will be defined as follows:

- Ecosystem Services:[2] This paper will use the one of the broader definitions[3] associated with the concept of ecosystem services: "the conditions and processes through which natural ecosystems, and the species that make them up, sustain and fulfill human life."[4] These "conditions and processes" can include purifying air and water, enhancing fish and wildlife habitat, mitigating droughts and floods, and regulating climate;

- Multi-Credit Ecosystem Marketplace: A centralized system of buying and selling multiple types of environmental services, both for regulatory (mitigation requirements) and non-regulatory (voluntary) purposes;

- Multi-Credit Trading: The actual process of buying and selling credits created through the restoration and conservation of ecosystem services;

- Multi-Credit (or multi-function) Banks: The land and restoration/conservation projects that can generate credits for regulatory and non-regulatory purposes,

[2] There will be a distinction made between ecosystem "goods" and "services" because, traditionally, markets have placed numerical values on "ecosystem goods," such as timber and agricultural crops, but not for "services." This is because, historically, ecosystem services were "free" because they were public goods and were abundant. However, with an ever increasing consumptive world population, it has become apparent that these public goods have limits and need to be "valued" so that they are adequately preserved.

[3] Please note that this definition relates to an ecological perspective; for purposes of analyzing economic value, there is often a distinction made between "functions" and "services."

[4] Geoffrey Heal et al., *Protecting Natural Capital Through Ecosystem Service Districts*, 20 Stan. Envtl. L.J. 333, 336 (May 2001)(citing John Peterson Myers, Nature's Services: Societal Dependence on Natural Ecosystems 3 (Gretchen C. Daily ed., 1997).

including conservation of wetlands and habitat, water quality, carbon sequestration and other ecosystem services.

BACKGROUND

Willamette Partnership

In 2004, the Willamette Partnership was formed as a nonprofit organization dedicated to increasing the pace, scope, and effectiveness of conservation in the Willamette Basin. The Partnership's board of directors are a diverse group of stakeholders with decades of experience in conservation, agriculture, land development, forestry, environmental law, ecology and water management — all frustrated with the region's inability to address problems associated with water quality and quantity, endangered species, and the overall loss, fragmentation and degradation of the landscape in an integrated and coordinated manner. Despite a considerable investment in various mitigation programs, improvements on-the-ground are not generally considered ecologically effective because they are too small, too dispersed, and not necessarily located in the places with the greatest potential for restoration.

At the same time, developers and wetland/conservation bankers have been frustrated with the delays and expense associated with the mitigation process. Much of the land in the Willamette Basin that is otherwise suitable for industrial development contains extensive wetlands, but wetland mitigation banks do not provide enough credits to meet the demand. With respect to conservation banks, efforts to create these banks for endangered species have been complicated by a number of factors, and currently only thirty-five conservation banking agreements exist in the United States.[5]

In light of these growing frustrations, in early 2006, the Willamette Partnership was awarded a grant from the U.S. Environmental Protection Agency to create a water quality trading program (to cool the water) in the main stem and tributaries, and to develop an institutional framework for a multi-credit trading system. It was generally recognized that treating each element of the ecosystem (water temperature, phosphorus, individual endangered species, wetlands, carbon, etc.) is administratively complex, expensive, ecologically ineffective and intimidating to landowners who might otherwise be enthusiastic about restoring land. Thus, there has been an overall recognition that it would be more effective and efficient to integrate ecosystem elements within a bank site rather than keep them separate.

Likewise, since ecosystems provide "services," such as clean water and species habitat, the notion of providing payments for ecosystem services to landowners that nurture these services is often discussed as a strategy for improving conservation and restoration efforts at a scale that will be effective. Yet, there is no

[5] Most of the agreements are in California (30), but there are a few others in Arizona(2), Colorado(1) and Texas (2).

comprehensive program that provides payments to landowners who do so. Consequently, the overall goal of the Partnership's effort is to create pathways to combine multiple sources of revenue for substantial ecological restoration projects in priority areas, while streamlining development in appropriate areas. An ideal solution will benefit the public, the landscape, landowners, and those whose activities impact ecosystems, but there are challenges to this because existing mitigation and incentive programs were created for different purposes, governed by different rules, and administered by different agencies.

Willamette Ecosystem Marketplace

Such ideas and goals have led the Willamette Partnership to begin defining and implementing the concept of a Willamette Ecosystem Marketplace to facilitate more strategic investment in priority habitats and to achieve multiple ecological objectives. These objectives include improvement of water quality and quantity, protection and restoration of priority fish and wildlife habitats, recovery of endangered species populations, as well as avoidance of additional listings, and overall reduction of greenhouse gases in the atmosphere. The basin is blessed (or cursed) with extensive technical information about the status and distribution of these resources and has multiple plans addressing ecological improvement.

One critical element of the marketplace concept is recognition and agreement concerning the goals, and a clear strategy to accomplish them, through more effective use of existing funds and programs, and the creation of new revenue streams, especially from the private sector. The Comprehensive Wildlife Conservation Strategy (or State Wildlife Action Plan) published by the Oregon Department of Fish and Wildlife helps articulate these goals, while an "Alternative Futures Project"[6] provides an extensive technical background. The Oregon Chapter of the Nature Conservancy is also working to synthesize these and other Willamette Basin conservation plans to help highlight shared priorities.

The Partnership has also retained a team of consultants from David Evans and Associates and CH2M Hill to evaluate a range of options for the management of an ecosystem marketplace in the basin. These options range from a "market clearinghouse" where the Partnership simply provides buyers and sellers of ecosystem services with information about how to get in touch with each other, to a "market facilitator" that matches buyers and sellers and steers them to priority projects, to a more active "market manager" where the Partnership would support project implementation, as well as provide technical services to landowners.

This momentum makes it apparent that an ecosystem marketplace is becoming more and more of a reality in the Willamette Valley. Thus, it is critical to identify any potential limitations

[6] This project was a market demand study showing where development is likely to occur, in what volume, and with what impacts to ecosystem services.

that may exist, in order to make the implementation process as smooth as possible.

OPPORTUNITIES: EXISTING MITIGATION PROGRAMS

There are some mechanisms already in place, including mitigation programs, which can help advance the implementation of a multi-credit trading system because they are similar in concept and, thus, familiar. Furthermore, many agencies, landowners and other parties have already expressed an increasing interest in multi-credit banking because it is a tool that can concentrate conservation efforts and investments, as well as diversify income for landowners.

While current mitigation programs are theoretically centered on alleviating impacts of development, the underlying benefit is the preservation of ecosystem services. For example, a developer can purchase credits from a wetland mitigation bank to mitigate the loss of a wetland. This wetland mitigation bank, in turn, provides fish and wildlife habitat, higher water quality and flood control "services." For our purposes, this paper will focus on the following four mitigation programs that could likely be the initial components of a multi-credit marketplace: (1) wetland mitigation banking; (2) conservation banking; (3) water quality trading; and (4) carbon offset programs.

Since these programs already use "credits" to facilitate trades that offset impacts for both regulatory and non-regulatory purposes, they have opened the door to the concept of a multi-credit trading scheme. Although these tools were created to address specific ecological components rather than address issues in an ecosystem wide approach, a multi-credit marketplace could integrate the concepts associated with these programs. Such integration can expand the market beyond the regulated community and can provide a more economic and ecologically effective approach to conservation.

Wetland Mitigation Banking

Wetland mitigation banking is one of the more familiar forms of mitigation. This program is driven by federal, state and sometimes local regulations that require public and private developers to avoid, minimize, or mitigate the destruction of wetlands to achieve "no net loss" of wetland resources. The result has been the creation of a mitigation banking industry in which landowners restore wetlands and sell "credits" to the developers.

Conservation Banking

Similar to wetlands mitigation banking, more recent federal and state policies have emerged that allow "conservation banking" for endangered species. In this program, landowners provide endangered species habitat in exchange for payments intended to cover the cost of the property and its management in perpetuity. Specifically in Oregon, the Oregon Department of Fish and Wildlife's Comprehensive Wildlife Conservation Strategy (or State Wildlife Action Plan) proposed a statewide system of

[7] Oregon Department of Fish and Wildlife, The Oregon Conservation Strategy (February 2006).

conservation banking which reflects the agency's interest in pursuing banking as an option to comply with mitigation requirements.[7]

Water Quality Trading

Another mitigation concept that is now being tested in several parts of the United States, including the Willamette Basin, is water quality trading. This type of trading is driven by requirements for industry and local governments and others to meet Clean Water Act standards. It allows industrial polluters to purchase "credits" from landowners who restore riparian and floodplain habitat which contributes to cooling water and filtering pollutants.

Carbon Trading

Finally, unlike wetlands, conservation and water quality programs, carbon offset programs are not universally propelled by regulatory obligations, but are often pursued for voluntary purposes.[8] Carbon offset programs offer agricultural and forest landowners the opportunity to sell credits for activities such as reforestation, conservation tillage and more effective fertilizer application. These activities can reduce soil erosion, improve nutrient cycling and water quality, and protect habitat while also sequestering carbon and potentially offsetting carbon dioxide emissions.[9]

LIMITATIONS[10]

Historically, laws and institutions were not designed with ecosystem services in mind.[11] Protection or regulation has typically lacked an ecosystem nexus and, instead, has focused on specific activities or individual species. For example, federal pollution laws (Clean Water Act and Clean Air Act) rely on human health-based standards, while federal conservation laws (Endangered Species Act and Marine Mammal Protection Act) focus on species-specific recovery.[12] Similarly, due to non-ecologically

[7] Oregon Department of Fish and Wildlife, The Oregon Conservation Strategy (February 2006).

[8] Some states have taken the initiative to regulate statewide carbon emissions. Also, there are national cap and trade programs that are regulated, such as for sulfur dioxide emissions, but there is current debate regarding who is responsible for regulating greenhouse gases. A case was recently heard in the United States Supreme Court (Massachusetts v. EPA) and an opinion is expected in the spring of 2007.

[9] One of the problems associated with promoting carbon sequestration is that the U.S. is not a signatory to the Kyoto Treaty, the international impetus for a carbon credit market to reduce carbon dioxide emissions. However, there are programs, such as the Chicago Carbon Exchange, and groups, such as the Oregon Climate Trust, that are dedicated to carbon trading programs. More importantly, several states have taken an active role in setting higher carbon dioxide emission standards which, in turn, may elevate the need for carbon credits to polluters who need to mitigate their impacts to air quality.

[10] For purposes of this paper, it is important to recognize that the limitations discussed in this paper are to identify the issues that need to be considered during implementation of a multi-credit system, not to provide an exhaustive analysis of federal and state policies.

[11] James Salzman, *Creating Markets for Ecosystem Services: Notes from the Field*, 80 N.Y.U. L. Rev. 870, 880-81 (June 2005).

[12] *Id.*

relevant political boundaries, institutions were not designed to coordinate efforts in managing landscapes to maintain ecosystem services.

Such oversight has resulted in somewhat of a blank slate with respect to a multi-credit ecosystem marketplace because there are no laws against its creation. Yet there are statutory and institutional constraints in place that could inadvertently hinder participation in a market-place system which need to be addressed prior to implementation.

Statutory

This section will address limitations rooted in law (constitutional and/or statutory) that could potentially affect an agency's participation in a multi-credit ecosystem marketplace. Currently, there are two limitations that have been identified: the first is associated with the Oregon Department of Transportation, while the other concerns the Department of State Lands. Opportunity exists to address these limitations through either engaging the agencies in a different role, such as a buyer of credits rather than a bank owner, or amending the statutes.

Aside from these more obvious statutory limitations, it is important to recognize that more subtle statutory limitations may not be realized until the actual implementation of a multi-credit trading system. However, development of a pilot project may help identify these unknown limitations, if any, and provide the opportunity to address them prior to the establishment of a fully functioning multi-credit ecosystem marketplace.

- **Oregon Department of Transportation**

The Oregon Department of Transportation is required to mitigate adverse ecological impacts associated with road construction. Most of these impacts are relatively small and widely dispersed, but in the aggregate, create a significant need for investment by the agency. The department is generally supportive of a more efficient and effective approach. However, it is constrained by a constitutional requirement that gas tax money be spent on transportation projects. This limits the agency's ability to sell credits to third parties from a mitigation bank. Specifically, taxes collected on gas sales must be “used exclusively for construction, reconstruction, improvement, repair, maintenance, operation and use of public highways, roads, streets and roadside rest areas” in the state.[13] Thus, if the department uses gas tax dollars to *knowingly* restore more habitat than required by their impacts in order to generate sellable credits, it violates the state constitution because the tax dollars used to generate those sellable credits were not used exclusively for impacts associated with roads.

It is important to note that there is a slight caveat to this limitation: if the department *unknowingly* produces more credits than what was required for their impact, it can sell these “surplus” credits. Yet reliance on this caveat

[13] OR Const. art. IX, § 3(a).

does not provide a practical solution to this limitation. Also, while the department has a special projects fund that is not solely dedicated to road development because it is funded by the non-transportation related tax (the "lawnmower" fund), it is a competitive fund which makes it very difficult to get to the money. Again, trying to dip into this fund does not provide a practical, long-term solution for the department.

It is important to keep in mind that the gas tax limitation solely affects the agency's role as a lone bank property owner in an ecosystem marketplace, not in other roles. For example, the agency can partner with another agency and share the costs of maintaining a bank property. While the transportation department's share could not be used to sell credits, there is nothing preventing the other agency from selling credits from its share. In other words, the gas tax limitation does not prevent the agency from allowing a partner agency to sell credits on a jointly-owned bank.

In addition, the constitutional provision does not prevent the agency from simply acting as a purchaser of credits. It would be most practical for the agency to purchase credits from an already established, well-maintained, productive conservation bank rather than mess with purchasing and maintaining its own banks. This makes the department's job much easier and eliminates any concern over the agency owning a bank, but not having the ability to sell credits. Nonetheless, while this would be a practical solution, a sufficient number of banks with ecological values that correspond to those impacted by transportation projects do not yet exist in the Willamette Valley or elsewhere.

Therefore, although there are ways to get around the department's gas tax limitation, it would be more appropriately addressed in some type of legislation or regulation that clarifies the agency's role and provides a clear path to its involvement in a multi-credit ecosystem marketplace.[14]

- **Oregon Department of State Lands**

The Oregon Department of State Lands administers the state's wetland mitigation banking program, in cooperation with the U.S. Army Corps of Engineers. When landowners seek permits to alter wetlands, they are required to replace the resource by improving, creating or restoring wetlands.[15] The department's wetland mitigation program assists landowners with plans, helps establish mitigation banks and monitors the development of mitigation sites.

[14] Since the gas tax limitation is housed under the state constitution, it is a complicated process to amend the constitution to allow the gas tax to be used for more than projects associated with roads. However, some clarifying language within legislation or a regulation associated with an ecosystem marketplace could clarify the agency's role within the system, e.g., as a purchaser. In other words, the language could give the agency the green light to participate in a marketplace but not require a constitutional amendment in order to remove the gas tax limitation. Another potential solution would be to set up a fund or make part of a fund dedicated to mitigation banking, allowing the agency to sell credits, similar to the special projects fund.

[15] See O.R.S. § 196.605 et seq.

However, the department is statutorily prohibited from allowing credits to be sold on wetland mitigation banks for any purpose other than permits and violations.[16] This, in effect, prevents the agency from being able to transfer (or sell) credits to third parties in an ecosystem marketplace. Part of the concern that led to this limitation was an initial fear that an interest group could buy up all the credits and effectively stifle development, but this concern appears to have subsided.

While this does not impose a complete restriction on the agency's participation in an ecosystem marketplace, it inhibits the involvement of a credit broker to facilitate trades and fragments a process that needs to be kept consistent. Thus, this limitation should be addressed by changing the statute. Allowing third party sales can only deepen the market, provide the flexibility needed in a marketplace structure and can help make the process of buying and selling credits more efficient.

Institutional

These are limitations related to an agency's regulations, values, and overall attitudes towards the concept of a multi-credit ecosystem marketplace. Some of these concerns also encompass political perspectives on the issue. While most of these are simply considerations that need to be taken into account as a marketplace is developed, others may require a more formal solution, such as implementation of an executive order or policy guidance that directs agencies to change or clarify regulations or policies.

- **Multi-Credit Valuation Method**

One of the primary obstacles to the creation of a multi-credit marketplace is the lack of a consistent, agency approved accounting system to quantify the "value" of ecosystem services. Developing a common accounting system is not a trivial matter. There are always potential gaps between theory and results in a valuing system, e.g., planting X number of trees will sequester Y tons of carbon, as well as the possibility of "double-dipping" and overcompensating conservation bankers (which will be discussed in detail later).

Since not all natural resources are created equally, there also will be circumstances when more egregious impacts will need to be accounted for in sensitive habitats, likely in proportional ratios (e.g., for every 1 acre impacted, 3 credits must be purchased). Likewise, there is also a need to quantify "surplus" credits when a multi-credit banker goes above and beyond what was originally intended for the bank or targets a priority habitat. Although initially a bank will be allocated a set number of credits, allowing a banker to receive more credits if additional restorative efforts are taken can only further the ecological integrity of a bank and give greater financial incentive for a banker to do so. All of these considerations need to be taken into

[16] O.R.S. § 196.620.

account as a credit valuation method is being developed and assessed.

The Oregon Department of Transportation became interested in developing a multi-credit valuation method because the agency needed to mitigate impacts from road development and enhancement and there were not enough credits being generated to meet its needs. The agency contracted with Parametrix (an engineering, planning and environmental services firm) to develop a technically and scientifically sound valuation method.[17] However, there were complications because the department realized that its project impacts were less than originally expected and decided that it was not realistic to spend considerable amounts of time and resources owning and maintaining banks.

At the request of other parties, Parametrix has continued to work on a major revision of the valuation method, in order to reduce its complexity and to adequately capture potential variations in the accounting. Also, the method did not incorporate other types of services, such as water quality[18] or carbon sequestration. So, while there are credit valuation methods being developed that are getting closer and closer to providing an accepted and reliable accounting method, it will take some time and careful consideration of all the issues that are involved in order to successfully do so.

- **Bundling, Stacking and Consolidating Credits**

Associated with developing a tool to value multiple ecosystem credits on a site is whether credits should be bundled, stacked or consolidated within a common currency. Bundled or stacked credits refers to having a site that generates multiple credit sales from the same restoration or conservation action.[19] For example, a landowner can restore a wetland that not only generates a habitat credit for an endangered species, but also provides a water quality credit. On the other hand, one currency could be developed so that a bank simply provides "ecosystem credits" which can be used for various mitigation requirements. Thus, a developer can buy an ecosystem service credit(s) to mitigate its destruction of a wetland.

One specific concern associated with bundling credits is the concept of "double-dipping." Double-dipping means selling the same

[17] *See* Appendix A for a description of the habitat evaluation tool that was developed for the Oregon Department of Transportation. Although the Department of Transportation ran into implementation issues and was not able to use the method, Parametrix has continued to try to improve the method in order to reduce its complexity.

[18] Parametrix is currently working with Clean Water Services on the water quality component.

[19] For purposes of this paper, bundled credits refers to different types of credits generated from one site that are not geographically separated according to type. For example, one site could generate 100 habitat credits and 50 wetland credits. Stacked credits, however, refers to different types of credits that are geographically separated within one site. For instance, one site may be split into two parts: one half generating water quality credits while the other generates habitat credits.

functions twice to mitigate separate project impacts. For example, suppose a single bank site produces 100 wetland credits and 100 species credits, for a total of 200 credits. However, within those 200 credits, there is an overlap — 25 credits that were counted for wetland purposes are also good for species purposes. Therefore, if developer A impacts a wetland and buys 10 wetland credits and developer B buys 10 species credits, it might be difficult to tell whether the credits sold were part of the 25 overlapping credits. In other words, there is no way to tell whether the wetland credits sold were some of the same credits sold as the species credits. Effectively, there is potential that each developer only purchased part of a credit to compensate for a full credit's worth of impacts.

These issues need to be addressed as a credit valuation method is developed. The initial question will be whether or not credits should be bundled, stacked or consolidated into a single currency. The next step will be to develop an accounting system based on that decision. Generally, the decision will rely on agency coordination and agreement and likely require changing the structures of current mitigation programs.

- **Forest and Agricultural Landowners**

Another overarching concern associated with valuing credits is whether a market for ecosystem services will actually engage forest and agriculture landowners. The hope is that offering payments for a variety of ecosystem services through credit sales will provide an incentive for landowners to address conservation priorities on their lands and make it either equal to or more lucrative than exclusively focusing on commodity production. The intention is to inspire private landowners to engage in multi-credit banking as a supplement or, in some cases, an alternative to intensive agriculture or forestry. Through providing additional revenue, banking could make a significant contribution to the restoration of ecological values on the landscape and help keep landowners from converting their land to other uses. Nonetheless, it is important to remember that, in order to engage a significant number of landowners in these activities, the rules must be clear, overly complex administrative obstacles removed, and the investment risk minimized.

- **Preference for On-Site Mitigation**

Some agencies have expressed a preference for on-site, in-kind mitigation. Historically, mitigation was steered to on-site locations because it was viewed as the most economically and ecologically appropriate means to offset development. The theory went that if you impact a site, it was only logical to restore an area on that same site to achieve a “no net loss.” It has become increasingly apparent, however, that on-site mitigation does not always present the best approach, because site-by-site mitigation can be expensive and sites are often too small to generate any meaningful ecological benefits.

Mitigation banking, on the other hand, could provide a more efficient system to address losses or impacts in advance of development actions. Banking can also address the need to restore larger, more strategic areas that can provide

substantial ecological benefits. Investing in and bundling credits on bank sites may further enhance the economic and ecological benefits.

Despite the recognition that off-site mitigation can often provide a more effective economic and ecological approach to mitigation and conservation, some agencies have yet to fully transform their policies on the topic. For example, the Department of State Lands has a regulation that legitimizes the agency's on-site mitigation preference. According to the regulation, "The Department will approve the [mitigation] bank option only after on-site mitigation has been examined and found to be impracticable."[20]

Although the Oregon Department of Fish and Wildlife, who is involved in approving mitigation actions to offset adverse impacts to fish, wildlife and habitat in the state,[21] has expressed enthusiasm for a new approach to mitigation, it has not completely evolved into a preference for off-site mitigation. While current agency regulations allow "in-proximity" habitat mitigation[22] which is defined as "within the same homerange, or watershed (depending on the species or population being considered) whichever will have the highest likelihood of benefiting fish and wildlife populations directly affected by the development,"[23] resources are limited, and resistance may come from staff with a preference for traditional on-site mitigation.

- **Incentive (Private Lands) Programs and Credits**

Some agencies believe that land restored with public funds should not generate credits that can be sold to private parties, unless there is an overall improvement in habitat value or function. The U.S. Fish and Wildlife Service is particularly concerned about this issue.[24] Being one of the primary administrators of the Endangered Species Act, the Service recognizes the importance of establishing conservation banks to more effectively mitigate adverse impacts to listed species. For the Service, such an approach helps reduce the piecemeal approach to conservation efforts that lack ecological integrity while, at the same time, allowing landowners to view habitat for listed species as a benefit rather than a liability.[25] In creating this conservation banking program, the Service developed a "guidance" document that addresses this concern.

[20] Or. Admin. R. 141-085-0131 (2006).

[21] Or. Admin. R. 635-415-0020, 635-415-0025 (2006).

[22] *Id.*

[23] *See id.* at 635-415-0005(13).

[24] Not all agencies hold this view. For example, the Natural Resources Conservation Service does not prohibit landowners from selling credits associated with ecological improvements financed by various incentive programs, as long as the obligations to the government have been met.

[25] U.S. Fish and Wildlife Service, *Guidance for the Establishment, Use and Operation of Conservation Banks*, 1 (May 2, 2003)(hereinafter "Guidance").

Generally, the agency does not want lands that have been restored with public funds to be used to sell credits. The guidance specifically states:

> "Where conservation values have already been permanently protected or restored under other Federal, State, Tribal, or local programs benefiting federally listed species, the Service will not recommend, support, or advocate the use of such lands as conservation banks for mitigating impacts to species listed under the ESA. This includes programs that compensate landowners who permanently protect or restore habitat for federally listed species on private agricultural lands…"[26]

Therefore, if a landowner received money from the Partners for Fish and Wildlife Program to enhance habitat for an endangered species and later decided to create a conservation bank on the same piece of property, it would not be acceptable under the Service's policy. The Oregon Watershed Enhancement Board, whose purpose is to promote and fund voluntary actions that strive to enhance Oregon's watersheds, also has an administrative rule that disallows funding from being used for mitigation projects.

Recently, there have been discussions among interested parties as to how to overcome these issues and some solutions have been identified. For example, if a landowner takes additional measures beyond those financed with the public funds, or uses a part of the land not restored with public funds, a landowner could be allowed to sell credits. Another possible solution could be the establishment of a revolving conservation fund. When a landowner receives money from an incentive program and then decides to sell credits, the money received from the program can then be utilized as a loan rather than a grant. Thus, the landowner would have to re-pay the amount given to conserve/restore the land that was originally intended to be a payment as part of an incentive program.

- **Enforcement of Regulatory Drivers**

Concern has also been expressed regarding the effectiveness of the "driver" for endangered species protection. Part of what makes a mitigation and conservation banking system work is a regulation that requires or prohibits certain actions. Under the Endangered Species Act, the primary driver for species management is the prohibition against "take"[27] of an endangered species.[28] As a result of the take provision, violators are encouraged to mitigate impacts to species and/or engage in conservation measures for species protection. Despite this requirement, however, some observers believe that lack of aggressive enforcement against

[26] *Guidance*, pg. 6.

[27] The term "take" means to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." 16 U.S.C. §1532 (18).

[28] Section 9 "take" also can apply to threatened species through special promulgation of a rule as advised under Section 4(d) of the Endangered Species Act. *See* 16 U.S.C. §§ 1533(d), 1538(a).

private landowners could reduce the demand for credits to compensate for damage to species or habitat.

Generally, this concern demonstrates a potential need to provide landowners with more than regulatory burdens. In fact, one could argue that there are more appropriate ways to motivate landowners to conserve species besides regulation, and that the marketplace should encompass voluntary, incentive based programs and funding sources as well. Such mechanisms would encourage landowners to restore and conserve landscapes rather than force them to.

- **Current Efforts**

As noted above, Oregon's resource agencies have some experience and a growing interest in banking as a potential new conservation tool. The next step is determining how to integrate the disparate programs, make them more accessible to landowners and create a process whereby collective investments are more likely to be made in priority areas and at an ecologically significant scale.

For example, the Oregon Department of Forestry administers a stand establishment (i.e. reforestation) program under the “Oregon Forest Resources Trust” statute.[29] The primary goal of this program is to help landowners establish and maintain healthy forests on under-producing forestlands.[30] The trust provides funding for the direct cost payments of site preparation, tree planting, seedling protection, and competitive release activities needed to achieve the primary goal. Initially, the funding for these activities came from state lottery funds, but additional funding has been obtained from the Klamath co-generation project as part of its carbon dioxide emission offset portfolio. However, there have been difficulties associated with investing these funds, namely because program complexity inhibits landowner participation. In any case, the agency has proposed expanding the program to include conservation activities beyond reforestation.

The Department of Forestry has also proposed legislation[31] that would establish a program to pay landowners to provide ecosystem services. HB 2293 suggests that the department would act as a broker of ecosystem services. However, this model has the potential to create yet another agency silo. Also, no funding was attached to the bill to ensure that it accomplishes its goals, and there have been no formal discussions about the potential for carbon offset payments managed by the Department of Forestry

[29] Or. Admin. R. 629-022-0030 et seq. (2006).

[30] According to regulations, the purpose of the trust is to "…improve management of forestlands for timber production, wildlife, water quality and other environmental purposes." Or. Admin. R. 629-022-0030.

[31] House Bill 2293 was referred to the Agricultural and Natural Resources Committee and a public hearing was held on January 30, 2007. The Department of Forestry asked for more time to work on the bill and it was ultimately recommended that a workgroup is created to further develop the provisions in the bill.

to be part of a larger integrated multi-credit trading system. While the potential does exist for this legislation to spark a broader policy discussion about the delivery of payments for ecosystem services, it is important for agencies and other interested parties to keep each other informed about individual efforts and work more collaboratively on the issue. If agencies continue to proceed on an individual basis, policies may result in various ecosystem service programs scattered across the state that will not be economically or ecologically effective.

- **Funding and Staffing**

Agencies often do not have the time, money or flexibility to be creative in approaching conservation, thereby limiting their opportunities for changing the current system. Therefore, since agencies will be some of the key players necessary to implementing a multi-credit marketplace, it will be important to ensure that they have the resources necessary to develop the program. Over time, however, designing a more efficient and integrated multi-agency and multi-credit system may save agencies money.

- **Oversight, Monitoring and Enforcement**

Associated with the concerns over adequate funding and staffing are concerns regarding oversight, monitoring and enforcement. Unless there is a mechanism in place that ensures the integrity of the trading system, some agencies are reluctant to relinquish control over specific mitigation programs. Some have proposed the creation of an oversight body to track credits generated and sold, and to monitor performance of multi-credit banks. There also may be an important role for the non-profit sector, like the Willamette Partnership, to broker trades, steer investment to priority areas, and generally look out for the public's interest in the system.

- **Carbon**

The ability to accurately value carbon credits has been the subject of debate. Unlike habitat and water quality valuations which can be calculated on a local basis (e.g. a specific watershed), carbon sequestration has global impacts which makes it more difficult to contain and effectively capture. Mechanisms regulating carbon are not as consistent as those regulating habitat and water quality which, again, makes it difficult to adequately capture its value.

There is also ambiguity regarding which aspects of the biological carbon cycle ought to be included in measuring it (trees, soils, oceans, etc.). Further complicating the issue is disagreement among parties about whether offset payments can be based on models or whether the carbon sequestration actually needs to be measured. It is complicated to determine, with at least some certainty, when an industry or company has met its sequestration requirements.

Another major issue in carbon trading is “additionality,” meaning that buyers of carbon credits need assurance that their investment is not supporting business practises as usual. Defining baselines, however, can be complicated

and controversial. Therefore, a need exists for a more consistent, efficient and reliable accounting tool for carbon.

- **Liability and Perpetual Maintenance**

Among landowners, agencies, industry and conservation organizations, the question often arises as to who should assume responsibility once credits are purchased for mitigation purposes. In addition, without any "perpetuity" mechanisms in place, there is concern that mitigation banks could be converted or re-converted to agriculture uses. Effectively, this could result in the loss of any restoration/conservation benefits that were achieved through bank implementation.

These concerns are specifically associated with the success of restoration (gaps between theory and results as mentioned above) and long-term management of a bank property, both financially and on-the-ground. As some current mitigation banking programs have shown, there are tools that can be used to help ensure banks are properly maintained and managed at least in the long-term, if not in perpetuity. Such tools as conservation easements, endowment funds and higher credit ratios can be included as part of the banking instrument in order to ensure proper maintenance and management. Another option may be to engage state or federal natural resource agencies by requiring them to maintain parcels to act as "insurance" for the banks that may not adequately "perform." These types of tools can help ease liability and perpetual maintenance concerns.

- **Mitigation vs. Avoidance**

Another concern associated with a market for ecosystem services is the possibility of pushing industries and developers towards mitigation rather than impact avoidance. Essentially, the promotion of mitigation/conservation banking can be perceived as a way to expedite development and avoid the punitive effects that some believe mitigation programs should have. This has also been raised as a concern with the cap and trade programs that have emerged throughout the country. Yet one potential way to deal with this concern is to also grant credits to developers who avoid impacts, thereby providing an economic incentive for them.

IV. OPTIONS FOR NEXT STEPS

There are several steps that could be taken now to begin advancing the creation of a multi-credit ecosystem marketplace in Oregon. Options include the following:

- Governor Kulongoski could issue an executive order directing agencies to support an ecosystem marketplace in Oregon and assist in the implementation of a pilot project in the Willamette Basin to help clarify issues needing attention;
- Passing legislation to authorize a pilot project in the Willamette Basin and direct agencies to report back to the legislature with recommendations concerning broader application;
- Creating an interagency task force, including members from outside government, to address the limitations associated with the establishment of a multi-credit ecosystem marketplace in Oregon;
- Initiating a process through which agencies and stakeholders examine ecosystem credit valuing options and develop a broadly accepted method of generating and transferring credits; and/or
- Removing/changing regulatory limitations that prevent an agency's full participation in a marketplace.

V. CONCLUSION

As this paper has demonstrated, while there are potential limitations to implementing a multi-credit ecosystem marketplace in the Willamette Basin, they need not prevent implementation from being successful. Overall, the opportunity exists within Oregon to make the concept of an ecosystem marketplace a reality. Indeed, there are actions that can be taken now to begin advancing the concept. An important first step is the development of a reliable and efficient accounting system. In addition, legislation or an executive order addressing the development of a multi-credit ecosystem marketplace and initiation of a pilot project could help in providing support to the effort. Addressing the limitation on the sale of wetland mitigation credits to third parties would also be helpful.

As one economist recognized, "While mainstream economists view the economy as an open system of pure exchange value with externalized environmental consequences, the steady progression of humanity toward the carrying capacity of the earth will require that economic activity be reconceived as a closed system within which environmental consequences must be considered."[31] The concept of a multi-credit ecosystem marketplace fully embraces this statement. Overall, these are exciting times for practitioners, landowners and investors because an ecosystem marketplace is a tool that can concentrate conservation efforts and investments, as well as diversify income for landowners, and can result in a more ecologically significant landscape.

[31] Douglas Kysar, *Sustainability, Distribution and the Macroeconomic Analysis of Law*, 43 B.C. L.Rev. 1, 9 (December 2001).

APPENDIX A Habitat Assessment Tool for Multi-Credit Banks

The basic premise of this tool is that regulators, by virtue of the way regulatory systems are structured, calculate improvements (or damage) to a site through a single resource lens. At the same time, however, there has been a need to be able to calculate the full suite of resources on a site. This accounting tool tries to do both — it collectively calculates "ecological uplift" from restoration actions, while also providing a calculation for each individual resource.

The Oregon Department of Transportation invested in the development of this accounting tool because the agency is required to mitigate its impacts from road development and enhancement. The department contracted with Parametrix (an engineering, planning and environmental services firm) to develop a tool to assess multiple types of ecosystem functions associated with habitat features. These values could generate credits to meet the department's mitigation requirements. Although the agency ran into implementation issues and decided not to complete development of the tool, Parametrix has continued to refine it with the assistance and encouragement of other parties.

In order to determine the value of an ecosystem function, the tool involves these steps:

Step 1: Identify the ecosystem functions that are relevant to the ecosystem features of concern.

This step identifies the primary ecological functions being impacted by development. For instance, the current method used in wetland mitigation banking measures the ability of wetlands to perform nine functions, such as habitat value or nitrogen uptake. This same logic applies to the Parametrix tool.

Step 2: Identify the habitat elements and structures that are most pertinent to performing the function(s) identified in step 1.

The intent of this step is not to identify all relevant habitat structures or elements, but only the most significant contributors. In most instances, the list can be limited to the top 3 to 5 factors that contribute to the ecological function. For example, the density of the tree canopy would be a significant factor in achieving cooling water temperatures.

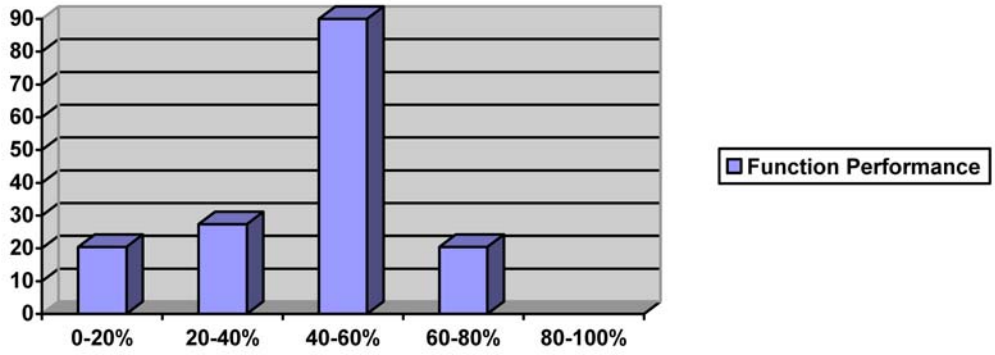
Step 3: For each of the habitat elements or structures identified in step 2, determine how each can be measured.

This step looks beyond whether a habitat element or structure is present or not to determine its value. It evaluates how a habitat element or

structure exists within the landscape. For example, how does the existing amount of tree density at a bank site contribute to the function of cooling water?

Step 4: Once the habitat element or structure is measured within the specific bank site, determine how adding or subtracting the element or structure will positively or negatively affect the function.

This can be visualized in a graph that is based on existing studies, published literature or best professional judgment in the field. For example, a graph looking at the amount of tree density in relation to cooling water could look like this:



The graph represents that tree density at 40-60% produces the best results for reducing water temperature.

This is a basic explanation of the tool, but does demonstrate how different types of ecosystem functions can be incorporated into the method. For further explanation or information, please contact: Kevin Halsey, Parametrix, Phone: (503)233-2400; Email: khalsey@parametrix.com.

ACKNOWLEDGMENTS:

Our special thanks to the following people who participated in interviews, reviewed drafts of this paper and offered suggestions:

Mike Cafferata, Oregon Department of Forestry
Jim Cathcart, Oregon Department of Forestry
Bobby Cochran, Clean Water Services
Bob Deal, U.S.D.A. Forest Service Pacific Northwest Research Station
Dana Field, Oregon Department of State Lands
Kevin Halsey, Parametrix
Mark Knaupp, wetland mitigation banker
Tom Lindley, Perkins Coie, LLC
John Marshall, U.S. Fish and Wildlife Service
Neil Mullane, Oregon Department of Environmental Quality
Bill Ryan, Oregon Department of Transportation
Gabrielle Schiffer, Office of the Governor, Economic Revitalization Team
Marcia Sinclair, Willamette Partnership
Bill Warncke, Oregon Department of Transportation


DEFENDERS
OF WILDLIFE