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## **Conservation Markets for Agriculture**

Issue and Discussion Paper

**Prepared for:**  
Conservation Markets Workshop and  
Listening Session for Agriculture

Water Resources Education Center  
Vancouver, WA  
November 5, 2008

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## Conservation Markets

### A. Some context for the discussion:

Agriculture in the Pacific Northwest is caught in a collision between massive growth and a sensitive environment. On the one hand, our region is a modern American economic miracle with a population expected to grow by a factor of 3-7 over the next century<sup>1</sup> and home to a flourishing international marketplace (with agriculture a major export industry). On the other hand, our region is also environmentally sensitive, with many endangered species (including several species of Pacific Salmon) and a landscape laced with a vulnerable network of streams and rivers, many of which are already listed by the U.S. Environmental Protection Agency (EPA) as polluted. Even the growth we've already experienced is generating significant environmental dislocation for our citizens – including in the agriculture industry. It is hard to imagine those impacts with, say, five-times our current population.

Well over half of our private lands are actively farmed and generally those are the lands where the most practical, cost-efficient environmental gains are possible – gains that are cost-efficient because they can often be accomplished using well known, standard best management practices (BMPs) and can be implemented without disrupting current economic activity. Given anticipated growth and its impacts - it seems likely that, in the years to come, our farms will experience ever-intensifying environmental pressure as the rest of society is compelled increasingly to mitigate for the impacts of urban expansion, economic prosperity, a rising standard of living, population growth, and urban development. One of our questions needs to be: What form will those pressures take?

One possibility may be increased regulation. But intensifying environmental requirements on agricultural operations would be costly to farmers and could result in farms being sold for to development with negative environmental effects. We need successful farm businesses in place if we are to avoid the fragmentation and loss of our agricultural landscape to more intensive and environmentally damaging uses. The official NOAA Fisheries, Puget Sound Salmon Recovery Plan, for example, specifically found that saving the region's farms, and keeping them economically viable, is essential to maintaining the open undeveloped landscapes necessary for salmon recovery.<sup>2</sup> The recent 50-year Cascade Agenda for Puget Sound finds the same thing – that we must save our farms if we are to save the environment.<sup>3</sup>

Of course we all know we need our farms for the food and fiber they grow. But now, in addition, it is becoming clear that our farms can also provide critical environmental services like sequestering carbon, filtering water and providing wildlife habitat. So it is not a choice! Saving economically viable farms and securing their help in maintaining environmental quality for our communities are both vital to the survival of countless species as well as to our health, economy, and quality of life in the Pacific Northwest.

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## **B. What is a “conservation market”?**

The traditional way that U.S. agriculture has addressed environmental issues without incurring the imposition of increased environmental regulation has been through conservation incentives. Current conservation incentive programs available through the USDA Natural Resources Conservation Services (NRCS) and through local conservation districts already represent a kind of conservation market. These programs typically make a payment in exchange for which the landowner provides environmental services. But these are, for the most part, “cost share” programs that pay only a portion of the actual outlay for implementing the BMPs that result in the service. As such, they typically rely on public-spirited landowners rather than creating a true marketplace that pays a full and fair value for services provided. Similarly, government programs that provide public payment for environmental restoration projects, transfer or purchase of development rights programs, and many other existing programs, both public and private, all involve some kind of payment in exchange for providing environmental services. Both USDA and EPA also offer competitive grant programs to help universities, consultants, nonprofits and farmers develop and implement BMPs. For example, EPA Region 10’s Strategic Agricultural Program has significantly increased the acreage and number of farmers using Integrated Pest Management to reduce the use of highly toxic pesticides and improve the environment. In several locations around the Northwest, these efforts have helped farmers produce cleaner water. All could potentially be seen as creating conservation markets.

Our intent, for the purposes of this discussion, however, is somewhat more specific. It contemplates the existence of a more structured and traditional marketplace. This means there are formal institutions that facilitate transactions. There are specified “goods” or “services” for sale. There are buyers and sellers interested in trading for them. Enough “trades” are made, in an open setting, with standard measures of quality, to allow similar goods and services to acquire a commonly understood value. And there are clear legal standards with enforceable rules of conduct that create certainty and make it possible for the market to work.

## **C. The emergence of conservation markets:**

Over the past decade, markets of this kind have increasingly emerged across the United States. There are now many models for how such markets can work. Typically, the buyers in these markets are motivated either by so-called “green” demand from consumers, or by requirements under some type of regulatory cap or limit on allowable contributions that can be made toward the impairment of some set of environmental values.

Green market demand, for example, is illustrated by heightened consumer interest in certified environmentally friendly products.<sup>4</sup> It is also seen in the increasingly common corporate practice of purchasing “offsets” that mitigate for the environmental damage caused by a firm’s business activities. This gives their products greater appeal for consumers and gives their stocks increased value for investors.<sup>5</sup>

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Such voluntary, consumer-driven markets contribute significant value and are the foundation for a good deal of conservation market activity in the U.S. today. The most substantial and well-funded conservation markets, however, are generally driven by some type of regulatory limit or “cap” on allowable contributions that can be made toward the impairment of some set of environmental values.

Markets of both kinds are already available to agricultural landowners to various degrees and in many locations around the country. In some instances, these markets are already providing significant value for the agricultural businesses involved. In others, they are still somewhat tentative and produce limited value. But the trend and the possibilities are clear – conservation markets are coming. And as they emerge, they represent a real opportunity for:

1. Providing significant ancillary income to enhance traditional farming operations;
2. Creating a much more effective and agriculture-friendly alternative to increasing environmental regulation; and,
3. Creating a less expensive source of environmental services to improve environmental quality in our region – a service agriculture can provide to our communities (and take credit for).

There are a number of specific examples of mature or fledgling conservation market arrangements described in the appendices to this discussion paper. Each of them suggests a way we might approach the development of markets in our own communities. In considering these examples, one should look for their lessons. But one should also keep an open mind to other approaches that may not yet have fully jelled but that could still create great benefit for our farmers, our environment, and our region.

## **D. Types of markets:**

Conservation markets generally arise out of public concern over certain key environmental values like air quality (and climate change), water quality (and pollution), wetlands or aquatic resources (independently and in connection with other issues), and wildlife habitat (endangered and otherwise). In some cases, these concerns have already produced a regulatory cap or limit that drives the market demand. In others, it is the anticipation of such a future limit that motivates buyers. And in some, the foundation for the market rests on ever-increasing green demand by consumers and investors.

Where such markets exist, the challenge for agricultural landowners endeavoring to supply them is to find a way to provide the particular set of environmental benefits needed by the buyers in a way that is consistent with their current farming or ranching operations and at a price and with an effectiveness that will make their services appealing:

### ***1. Carbon sequestration:***

Carbon sequestration markets are mostly driven by public concern about climate change. This concern has produced formal markets internationally and here in the United States<sup>6</sup> that pay for activities which reduce the amount of carbon released into the atmosphere. It may generate public green demand (as is the case in the United States). Or it may result in government

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regulatory pressure (as is the case internationally in countries that have ratified the Kyoto Protocol<sup>7</sup> or in states that have adopted a local program).

The typical buyer is a large industrial air polluter whose carbon emissions would be difficult and expensive to reduce directly. As an alternative, to meet acceptable standards, this polluter might purchase carbon “credits” from a farm operator who can either reduce his or her own farm emissions (e.g. bio-digesters) or employ land use management practices to absorb and sequester carbon from the atmosphere (e.g. planting trees on unfarmed land) and offset the impacts of the buyer’s activities.

### Opportunities:

Even at the lower prices now available in the United States, our agriculture industry has begun to see some modest benefits from carbon markets. For example, some of our region’s grain producers already participate by selling carbon sequestration credits earned through their use of “low-till,” direct seed practices.<sup>8</sup> Dairy and other livestock operators are earning significant carbon credits through the use of bio-digester technology for animal waste.<sup>9</sup> There appear to be carbon sequestration possibilities in the cattle industry through improved rangeland management practices.<sup>10</sup> Marketable credits can be earned by planting trees in otherwise unused locations, in farm woodlots, buffers, or unproductive areas. It is already a matter of considerable interest in our forest industry that longer harvest rotations, changed harvest practices, and other forest management techniques can earn such credits.<sup>11</sup> Opportunities in other agricultural commodities are under study.<sup>12</sup>

### Issues:

The main limitations for agriculture in making use of carbon markets seem to be:

- 1) The U.S. price, driven by green demand, is quite low – ranging from \$2 to \$7 per metric ton per year. While use of bio-digesters in the dairy industry, rangeland management BMPs in some parts of the country, and forest planting and management seem to be generating significant carbon credit income, the returns in no-till still seem pretty marginal.
- 2) Other than the examples mentioned above, further opportunities for trading in agriculture still need further study. This study is continuing, e.g. at Washington State University.<sup>13</sup> There is still work to be done to make carbon markets available to the full breadth of the agriculture industry.

### **2. Water quality credit trading:**<sup>14</sup>

Water quality trading is largely driven by public concern about water pollution and resulting government regulation of water quality. Mostly this market is motivated by the requirements of the Clean Water Act<sup>15</sup> and by similar local legislation.

A typical buyer might be a regulated point-source pollution discharger operating under a National Pollution Discharge Elimination System (NPDES) permit,<sup>16</sup> (like a public wastewater utility or a private industrial site, for example). The water body into which the point-source/potential buyer is discharging may have to meet a Total Maximum Daily Load requirement.<sup>17</sup> So the buyer’s NPDES permit may require it to significantly reduce its discharge of a regulated pollutant like nitrogen or phosphorous, for example. Rather than investing huge

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sums in building and operating costly high-tech infrastructure (treatment plant, filtration, etc.) to accomplish required pollution reductions, the point source pollution discharger may elect instead to contract with farmers, ranchers, and foresters upstream in the same watershed to implement traditional agricultural best management practices (BMPs) that can accomplish the same result at a greatly reduced cost.

#### Opportunities:

In this situation, water quality credits may be earned and sold by agricultural producers usually in exchange for their implementation of common, well-understood BMPs like managed rotational livestock grazing, cross-fencing and riparian fencing, modern irrigation systems, contour farming, no-till farming, grass strips, sediment dams, riparian stabilization and planting, buffers, etc. These and other BMPs are already well-known in the industry. Their development began with formation of the original “Soil Conservation Service” in response to the “Dust Bowl” era back in the 1930s. They are now formalized by the current USDA/Natural Resources Conservation Service (NRCS) in the BMPs described in their Field Office Technical Guide<sup>18</sup> and are widely in use and largely trusted by farmers, by environmentalists, and by the scientific/regulatory community alike.

#### Issues:

From an agriculture perspective, the principal limits on the utility of water quality markets seem to be:

- 1) Trading can only occur in the specific water body that is limited and into which the particular regulated point source is discharging, and then generally only with agricultural producers upstream from that point source. Often these water bodies may be quite small. So the number of farmers who can participate in such a market may be geographically limited to certain specific and potentially small areas.
- 2) Implementation of TMDLs under the Clean Water Act and similar legislation has often not yet progressed to the point where potential point source traders are sufficiently limited in their discharges to need to engage in trading.

#### **3. Mitigation for wetlands and aquatic resources:**<sup>19</sup>

A third major arena for conservation markets is driven by public concerns about the continuing nationwide loss of wetlands and resulting regulation that protects wetlands and aquatic resources. Wetlands are, of course, hugely important to the environment. In these markets, wetlands, riparian areas, and other aquatic resources are seen as having independent value although often the values they provide are actually a complex of environmental services like wildlife habitat, aquifer recharge, surface water filtration, flood detention, etc. Mitigation for their loss is generally expected to occur on an acre-for-acre or other straight replacement basis.

The need to directly replace damaged wetlands and aquatic resources on an acre-for-acre basis mostly arises out of the “no net loss” of wetlands policy that is firmly ensconced in the Clean Water Act<sup>20</sup> and, in some cases, in state<sup>21</sup> and local law as well. So those activities that might produce a loss of wetlands are accordingly required to replace that loss in “like kind.” Based on this and other legal requirements, as a condition for their building permits, residential, commercial, industrial, highway, and other developers are generally required to make up for unavoidable wetland or aquatic resource damage resulting from their projects including filling

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wetland areas or damage to estuaries, riparian zones, streams, and natural wet areas. These project developers are the usual buyers.

### Opportunities:

Since current requirements focus on replacing damaged wetland and aquatic resource values as an acre-for-acre outright replacement, thus far this market has resulted in few opportunities for agricultural producers. There are some, however. For example, an agricultural property may already include an existing but poorly functioning wetland whose environmental performance can be improved but that is worthless for agriculture. Or a farm might have areas of wet or inadequate soils that produce little agricultural value but that could be converted into valuable wetlands without significantly affecting the traditional farming operation. In such cases, the conversion or improvement of these locations as wetlands can provide environmental value that can be sold in a wetland or aquatic resource mitigation market and also provide significant supplemental income to the farmer. There are also, of course, circumstances where good quality farm ground may be purchased from the farmer by a developer or by a wetland banker for use as a wetland mitigation site – an outcome that may be satisfactory for the farm seller (although for public projects, eminent domain is also a possibility). But this may also be controversial for agriculture advocates struggling to preserve a critical mass of local lands for farming. So the upshot of wetland mitigation is, today, a bit of a mixed bag for agriculture.

It has been estimated that some \$350 million is currently spent annually on environmental mitigation just in the Puget Sound area alone and just for mitigation of public transportation projects alone.<sup>22</sup> Probably similar sums are being spent in Oregon. Most of this money is spent on wetlands and aquatic resource mitigation. If even a small percentage of that sum were available to agricultural suppliers of conservation services, it would make a huge difference for agriculture, so it is worth thinking carefully about this source of funding.

Additionally, one of the reasons that mitigation wetlands are increasingly being located in agricultural areas is that they tend to be unsuccessful if located in areas surrounded by development. So, even beyond the normal buffers associated with wetlands, the surrounding, undeveloped, agricultural landscape is increasingly seen as one of the prerequisites for the proper functioning of the wetland itself. This suggests opportunities for farmers and ranchers on those surrounding lands to potentially sell the assurance that those lands will remain undeveloped in the future.

### Issues:

Key limitations on agriculture's use of wetland and aquatic resource mitigation markets therefore include:

- 1) There are only a limited number of farms that include areas that can be easily used for wetland-aquatic resource replacement without taking productive land out of conventional farming.
- 2) The requirement of straight replacement of wetland-for-a-wetland often prevents farmers from being able to participate by producing and selling independent environmental values (like surface water filtration, flood detention, habitat for specific species, aquifer recharge, etc.) that make up the collective value generated by a wetland – without disrupting their farming.



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- 3) Wetland mitigation can result in quality farmland being taken out of agriculture – sometimes through a voluntary sale by a farm landowner and sometimes through condemnation or threat of condemnation.
- 4) Because the damaged wetland-aquatic values that need to be mitigated have generally been damaged permanently, the mitigation is generally also required to be permanent – something that may not work for all farmers.

#### **4. Wildlife habitat mitigation.**<sup>23</sup>

The loss of habitat for threatened or endangered wildlife species can also be a driver for environmental mitigation. The Federal Endangered Species Act<sup>24</sup>, for example, requires protection for listed species. And, for salmon, Tribal treaty fishing rights require the continued availability of salmon for harvest. In many places, this has led to requirements that developers step beyond just mitigating for wetland or for aquatic resource damage. Every species of wildlife has different habitat needs and when that habitat for a threatened species is affected, similar habitat may be needed as a replacement.

#### **Opportunities:**

On the positive side for agriculture, needed habitat for some species can often be of the kind farmers can supply without significantly disrupting their agricultural operations. And, unlike wetlands where in-kind replacement is required, for wildlife habitat, the preservation of existing habitat can often be sufficient. So there may be no need for land to come out of agriculture.

Thus, for example, mitigation for development damage to habitat for endangered shrimp, birds, and other species that depend on “vernal pools” and surrounding landscapes has led, in California, to arrangements with ranchers who already have vernal pools on their property. A landowner might provide a guarantee that he will not damage or destroy his existing pools, and perhaps that he will continue good conservation management of the surrounding lands. In exchange, he would receive payment from developers for the habitat credits that result.<sup>25</sup>

We have had local examples as well. Thus, a dairy farmer whose pasture may be of particular value to Swans might provide the assurance that the land will continue to be grazed and kept undeveloped in exchange for an appropriate payment. A farmer might agree to establish a three-year rotational wetland on his farm ground that provides habitat for migrating shorebirds one year and is drained and farmed the other two – with greatly enhanced productivity. The farmer would also receive payment for the habitat values provided. A farmer might get paid for planting a cover crop that is useful as feed for migrating birds or large mammals. Or, a farmer might plant and maintain native vegetation on unfarmed (and perhaps un-farmable) portions of the property and be paid for keeping them available for wildlife habitat. (This is part of the theory behind the Conservation Reserve Program [CRP] and CREP.)

#### **Issues:**

There are also issues, with respect to wildlife habitat mitigation, that need to be considered:

1. As with wetland/aquatic resource mitigation, wildlife habitat mitigation is replacing something that has been damaged in perpetuity, so the replacement needs to be perpetual as well – generally done by easement.

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2. Some of these opportunities will only work for certain farm properties and often only in geographical areas that are relatively near to the site of the development damage requiring the mitigation.
3. On the positive side, habitat mitigation under the ESA does not require that new habitat be created (possibly on quality farmland) as is the case for wetlands. So preservation and conservation management on existing farms can be paid for. Still, creation and banking of new habitat may on occasion also be possible, so there is still some threat here that quality farm ground could fall out of agriculture.

#### ***5. Mitigation for other environmental values:***

The four market examples listed above probably represent the largest areas of opportunity and can provide insight into how (and equally important, why) a conservation marketplace might work to the advantage of agriculture. But they are not by any means the only opportunities for conservation markets to emerge. With the exception of carbon markets, conservation markets tend to be driven by local needs and conditions and can emerge in response to the unique circumstances in a particular community. So the fact that a particular type of market does not yet exist should not dissuade us from considering the possibilities.

Suppose, for example, that a community was experiencing increasing flooding and flood damage from development, paving, logging, and human activities. One might conceive of a trading relationship arising to keep farms in active agriculture or forest lands in forestry to reduce flooding downriver. Indeed, among the rationales behind CRP is providing habitat for game birds – so CRP is broadly supported by sports clubs like the Izaak Walton League<sup>26</sup> and Ducks Unlimited<sup>27</sup> and hunting on agricultural lands is already a source of revenue for many farmers.<sup>28</sup> This is a conservation market. Suppose farmers owning lands along a river valley beneath publicly owned uplands with deer, elk, and other large mammals agreed, for payment, to maintain migration routes through their property so the wildlife could gain important access to the river.

There are probably as many possibilities as there are communities and situations. It seems worthwhile to keep our minds open to them.

## **E. Approaches and mechanisms for supporting conservation markets for agriculture.**

Various structures, approaches, and mechanisms are suggested by experience with conservation markets around the country. Many of them are significant in the concerns they might create or in the opportunities they might suggest for agriculture participation in these markets.

### ***1. Baseline and additionality issues***

For most conservation markets, the question arises: What does the agricultural landowner have to sell? If the buyer needs to reduce nitrogen levels in a polluted stream, for example, that buyer needs to be sure that the actions the landowner will undertake (and that the buyer will pay for) will not be ones that would have been done regardless of the transaction. What is the farmer required to do, by law? What are the associated benefits to the farm business of taking these

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conservation actions - are there other reasons why this payment might not be the real motivation for the landowner's actions? The buyer needs to purchase new or additional conservation actions that will improve conditions. This need is typically referred to as "additionality."

If they are to be certain they receive "additionality" buyers will need to establish some "baseline" of conservation performance – and the landowner will be able to sell those actions that exceed that baseline. There are various ways this might be done. In the forest industry, for example, which in the Northwest generally operates under strong forest practices laws, it may be that the average or typical level of conservation performance is compliance with the law. That then may become the baseline – and it will be those conservation practices and improvements in addition to the legal requirements that can be sold in a marketplace. Or, in a farming community, the buyer might be willing to take some type of an average of performance by all of the farmers in that community. In order to participate in a market, those farmers currently performing beneath that average will need to bring their operations up at least to that "baseline" average before they can then receive payment for the practices and impacts they achieve above that level. An average performer will receive payment only for anything new and further that is done.

Baseline requirements raise the issue of how or if to include "early-adopters" of higher levels of conservation performance (those who are already above average). How does one justify paying early-adopters who may have acted for entirely different reasons? Of course a community performance average would typically reflect constant shifts by individual properties from above average to below average performance, and vice versa. Payment to early-adopters could be seen as assuring their continued above-average performance thus assuring, over time, overall improvement in the community average. But does including early adopters truly add value? (There are a number of issues under consideration in the carbon arena for implementation if Congress decides to adopt a federal cap and trade program – which seems increasingly possible.<sup>29</sup> (See the detailed discussion on "additionality" attached in Appendix E.)

The price available in the market also affects additionality. If the price is very low in comparison with other costs and inputs, it is difficult to be confident that it was the purchase transaction that motivated the change in conservation practice by the landowner. For example, Washington and Oregon no-till farmers participating in Pacific Northwest Direct Seed's carbon market transaction receive only a few dollars, at best, per acre committed to the contract. With the current high cost of fertilizer, labor, and other inputs, it is hard for the buyer to be sure that these small payments actually caused the farmer to adopt no-till farming rather than that they actually did so for other, potentially more significant reasons.

Baseline and additionality requirements are not just a matter of negotiation between the buyer and the seller. They are driven also by the regulator whose requirements are behind the buyer's need to purchase these credits or by a certifier with whose requirements the buyer has committed to comply. The regulator or certifier will have standards on the matter of baseline, additionality, and early-adopters that will probably control the transaction.

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## ***2. Aggregators***

In many the most robust markets the typical buyer is a substantial business, government or institution in need of a much larger quantity of environmental services than a single farm or ranch landowner may be able to supply. For the buyer, finding and then dealing with a multitude of individual farmers (an industry with which they may be entirely unfamiliar) may be a daunting prospect. Moreover, the particulars of contracting and the nuances of negotiating a deal with such a buyer can be complex and specialized. The time it would take each individual farmer or rancher to enter the market, learn about the contract, and feel confident of the outcome may be well in excess of their realistic reward.

“Aggregators” are organizations that can fill this need. An aggregator may enter into a contract for environmental services to be provided to a large buyer and then fulfill their obligations under that large contract by, in turn, entering into a number of smaller contracts with individual farmers who will actually provide the services. The aggregator may also accept some of the legal risks of failure in the transaction. It will be sufficiently expert in the field to be able to negotiate a fair arrangement with the buyer. And it will hopefully understand agricultural producers well enough to be able to find the needed farmer-sellers and to enter into relatively straightforward deals appropriate to their needs. A good (and well trusted) agriculture aggregator might also be able to help farmer/rancher suppliers apply for what may be an otherwise complicated program. There is typically an aggregation fee that covers the aggregator’s risk and covers the costs and the risks of their services.

Sometimes, a knowledgeable buyer will simply by-pass the aggregator – as with Clean Water Services’ (CWS’s) water temperature program on the Tualatin River near Portland. Clean Water Services simply created a program of its own. Working in partnership with local conservation districts, NRCS, and other local governments, the CWS program provides additional resources to enrich and supplement existing riparian buffer and planting programs already available to farmers. With CWS funding, these programs became sufficiently generous to increase participation, to the benefit of water temperature in the Tualatin.<sup>30</sup>

Sometimes the aggregator may be a private for-profit firm for whom this is a major professional service and line of business. Several for-profit aggregators certified and transacting business on the Chicago Climate Exchange are mentioned in Appendix A (g) and in Appendix B.

There are also good examples of agriculture organizations serving as aggregators as a service to their members. The carbon market programs provided by the Iowa Farm Bureau, Kentucky Corn Growers, National Farmers Union, and Pacific Northwest Direct Seed Association are all examples of agriculture groups serving as aggregators for their members.<sup>31</sup> The aggregator fees, in this situation, go to defray the cost of the program and support the organization.

Aggregators might also serve the purpose of shortening the duration of contract obligations to make them more palatable for individual farm businesses. A large buyer is likely to require a long-term obligation that may be well in excess of what most farmers would be willing to enter. An aggregator, certified, licensed, insured, and presumably otherwise credible to the buyer might go ahead and contract for that long-term commitment, and then complete their contract obligation by entering a series of shorter-term contracts with individual landowners who will

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provide the services. Some of these individuals may exit the market when their short contract is complete. Most are likely to renew. Those that depart can be replaced with new entrants. And the aggregator may also contract for more services that are strictly required by their overall contract to make sure there is no default.

The lack of capable aggregators trusted by the agriculture industry – especially for markets other than carbon – may be a limit that has inhibited growth of conservation markets for agriculture.

### ***3. Technical assistance providers***

Ideally, farmers would supply conservation markets by implementing standard, well-understood best management practices (BMPs) already described by USDA/Natural Resources Conservation Service.<sup>32</sup> Presumably, however, additional practices and supply services may be designed as these markets mature. In either case, however, there may be a need to provide technical assistance to the supplier landowners who will need to clearly understand what the potential conservation market contract might require and then, once the contract is in place, implement the practices correctly so they can fulfill its obligations.

In many of the examples in the Appendices<sup>33</sup> this technical service provider role has been filled by the conservation districts and/or by NRCS. There will doubtless be circumstances where the landowner will seek the services of a conservation management professional with a private for-profit consulting firm. But the appeal of that approach may depend on whether the conservation market transaction will be lucrative enough to justify that expense. In appropriate circumstances, agriculture organizations, aggregators, non-profit conservation groups, and other government agencies might fill this role.

### ***4. Modeling and monitoring of conservation services***

Conservation markets present the question of how sellers and buyers measure and feel confidence in the services/products that are traded. One can picture complex formulas, detailed baseline measurements, and aggressive ongoing monitoring inspection.

In many cases, the reality may be a good deal simpler.

For example, for carbon markets, the anticipated carbon sequestration, per acre, resulting from direct seed practices is well understood. So the only monitoring that is required is to assure that the farmer is, indeed, implementing this practice – a simple task that might be accomplished with a very occasional “drive by.”

Most other conservation practices have also been similarly modeled. So, for example, given some minimal initial soil testing, a known slope and slope length, information about local climate, crops and tillage, etc., soil loss can be calculated using the Revised Universal Soil Loss Equation (RUSLE).<sup>34</sup> RUSLE is a widely used tool to estimate rates of soil erosion. Some states have on line calculators to aid producers and conservation professionals in making these calculations.<sup>35</sup> RUSLE can easily be used, in conjunction with minimal soil testing, to credibly estimate the rate of discharge of phosphorous, nitrogen, sediment, and other pollutants from agricultural lands and can serve as the basis for estimating reductions that can then be certified as credits to be paid for in a marketplace.

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Replacement valuation of wetlands is typically measured in acres – along with careful evaluation of the functional quality of the wetland. But this evaluation can be done very occasionally and is not unduly complex – although it will generally require the services of a professional biologist. Replacement valuation of wildlife habitat will also, typically, be based on acres and quality. But that will depend on the species – bird habitat for endangered woodpeckers, for example, is apparently measured based on the number of family groups.<sup>36</sup>

There may be circumstances when a method for measuring the service will still need to be modeled or even devised. But in general, this does not appear to be a significant barrier to trading. And, assuming the service contract is sufficiently lucrative, there does not appear to be a need for excessive or disruptive monitoring and inspection.

This does not, however, mean that monitoring does not create issues. Who will be responsible for monitoring, for example? Will this be left to an independent certifier, a consulting professional, NRCS or a conservation district, or will some type of self-certification be allowed. How much will monitoring cost and how will that factor in to the contract price? Will the overall performance of an entire agricultural community be measured and monitored, or will the monitoring be done farm by farm? How will failures to perform be resolved and what are the consequences of non-compliance? How one decides these issues may have substantial impact on the price to be paid.

#### ***5. Developer-responsible mitigation***

A starting point for environmental mitigation is that the developer takes on the legal responsibility to replace any damage that cannot be avoided or minimized. For lost wetlands, the law has generally favored their replacement on-site. So it is not uncommon to see a highway development with mitigation wetlands running close alongside the highway itself or a new apartment or office complex with a wetland adjacent to the building and designed right into the landscaping.

But, regulatory preference is shifting toward off-site mitigation. Recent studies of the performance of wetland mitigation indicate that, in terms of performance, we are not getting anywhere near full replacement value for the wetlands that are lost.<sup>37</sup> One of the reasons for this is that wetlands in areas that end up surrounded by developed land tend not to perform very well – even given the usual buffers that are required.

So the trend is for regulators to ask private developers to look for mitigation sites elsewhere in the watershed. This can, obviously, result in their acquiring an active farm and building their mitigation site on high quality farmland. But it could also result in an opportunity for a farmer who has some unproductive farmland or an area on his property that is already a wetland, albeit an underperforming one. Through sale, easement, contract, or other arrangement, developer-farmer transactions of this type seem quite possible.

#### ***6. Mitigation banking***

Developers who build houses, office complexes, malls, and highways do not always look forward to replacing damaged aquatic resources or wildlife habitat. Most would rather focus on

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their primary areas of expertise and either pay a fee or hire someone else to do the environmental mitigation. So there are private firms that specialize in building aquatic resources and wildlife habitat for mitigation. And the regulatory community will provide such specialized firms with advance certification for the environmental mitigation sites they create that allows them to then sell “mitigation credits” to a developer who needs to satisfy a mitigation requirement for a project somewhere else in the area. The building and advance certification of mitigation sites is called mitigation banking.

The environmental and regulatory communities generally like mitigation banks. With a bank, the quality of a mitigation site can be seen and approved after it is completed and functioning but in advance of approving the construction project that will destroy the values that must be replaced. So mitigation banks involve little risk for regulators. And because the site must be successful and functional before it can be approved for credit and before the credits can be sold, mitigation banks also tend to produce good, well functioning, environmentally successful sites. By comparison, developer-built sites may require extensive long-term monitoring, follow-up, and contract enforcement before a successful outcome can be achieved. Moreover, mitigation banks have the advantage that the mitigation is provided before it is needed – assuring that there will be no lapse in the availability of needed functions between when the damage is done at the development site and the later full replacement of those functions elsewhere.

Mitigation banking is relevant for agriculture because:

- There are opportunities for farmers to enter the mitigation banking business on those portions of their land that are unsuitable for agriculture.<sup>38</sup>
- Farmers are already creating habitat mitigation banks for some species by simply conserving their farms and committing to good management practices (consider the California vernal pool and other examples in Appendix D).
- As conservation markets evolve in the future, it may be possible for farmers to become certified to bank new kinds of environmental services and later sell them as the market develops.<sup>39</sup>
- Farmers can also contract with professional mitigation bankers to provide services that the mitigation banker will, in turn, sell to developers.

### ***7. Farmland protection policy***

Some of these emerging markets expose the agriculture industry overall to the potential loss of high quality farm ground to conservation uses. We are already experiencing the potential for that outcome in the area of wetland mitigation and salmon habitat restoration and the pressure seems likely to increase in the years ahead.<sup>40</sup> The agriculture community is concerned that growth and development in an urban area can, through mitigation, be so easily transformed into the loss of agricultural lands in a farming area some distance away. They worry about the resulting fragmentation of the farmland base, loss of local agriculture industry economic impact, loss of needed agricultural support infrastructure (suppliers, services, processors, etc.) in the community, and artificial inflation in the cost of agricultural properties.<sup>41</sup>

Wetland mitigation, in particular, is driven by a federal and legally enforceable “no-net-loss” of wetlands policy. But there is no commensurate “no-net-loss” of farmlands policy to provide a counterbalancing effect. Given anticipated growth in our region and the almost certain increase

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in the need for new development, transportation projects, and mitigation, there is clearly a need for some kind of policy that will assure that wetland and aquatic resource mitigation, in particular, is guided to locations that do not destroy high quality agriculture and do not undermine long-standing agricultural communities and economies.

Among the proposals that have been discussed for this purpose is possible adoption of a state-level “Farmland Protection Policy Act” akin to the Federal law by the same name.<sup>42</sup> Such an act could potentially include provisions that:

- Adopted official state policy to the effect that agricultural lands were a priority for the state. (Some version of a “no-net-loss” of farmland or of farmland values might be included.);
- Required that an conscious, specific official decision be made and a written rationale for the decision published when government action (state or local) will result in the loss of agricultural lands (e.g. government sale or purchase of land, condemnation, land use decisions, etc.);
- Provided criteria and standards to be used by the relevant agencies in making these decisions that included consideration of the values of farmland;
- Required consultation on such decisions with agricultural agencies like the Department of Agriculture and (in Washington) the State Conservation Commission;
- Required that such decisions be made in a public process including an opportunity for input from concerned citizens and groups; and,
- Provided a right to sue for citizen groups whose interests were adversely affected by the decision.

#### **8. Watershed approach**

The disappointing historical performance of mitigation wetlands, the trend toward off-site mitigation, and the increasingly large sums of money being spent on compensatory environmental mitigation generally, have all led the regulatory community to consider ways to more strategically target mitigation. Consideration is increasingly being given to using a broader “watershed approach” to environmental mitigation<sup>43</sup> that might allow communities to target the most serious needs, to achieve economies of scale, and to find environmental bargains – potentially by working with agricultural producers. It seems possible that in deciding where mitigation wetlands will be sited, how they interact with other conservation projects and programs, and how to spend other, related non-mitigation conservation dollars, a watershed approach to conservation mitigation might help create market opportunities for agricultural producers.

Farmers and ranchers may very well be able to replace lost environmental functions much more quickly and inexpensively than by other means. And they may also be able to provide a conservation friendly surrounding landscape into the bargain.

#### **9. Movement to a functional wetlands approach**

There is some (albeit limited) possibility that regulators might be willing to adopt a more “functional” approach to the replacement of some wetlands – perhaps particularly in those circumstances where wetlands are not what the relevant watershed most needs, but where there are other much higher environmental priorities under serious and immediate threat.



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This is a controversial topic for environmentalists. Wetlands, in particular, are so unique and multi-functional and their functions are so synergistic, that the environmental and regulatory communities will be slow to accept anything but a very well-grounded and scientific alternative. So there can be no expectation of any dramatic shift from the current policy which is, after all, firmly written into a foundational federal environmental law – the Clean Water Act.

Nonetheless, it is possible that, in some situations, we might move away from the current traditional “acre for acre” replacement policy for wetlands or for other types of environmental mitigation to an approach that requires the replacement of the discrete environmental values that have been lost – values like surface water filtration, aquifer recharge, flood detention, and habitat for particular species of wildlife. Unlike whole wetlands, these discrete values are ones that agricultural producers could generate on their farms and ranches with minimal disruption of their traditional farming operations. Doing so would create significant new opportunities for agriculture participation.

#### ***10. Fee in lieu programs***

Recent changes to the US Corps of Engineers mitigation rules<sup>44</sup> could also help open up conservation markets for agricultural producers. The new rules increase the priority (and the oversight) for so-called “in-lieu fee” programs as a tool for environmental mitigation.

An in-lieu fee program allows developers to simply pay a fee in-lieu of mitigation rather than actually being required to build the mitigation site themselves or to buy credits from a mitigation bank. The “in-lieu fee” program assembles these fees and then undertakes to find the sites and provide the mitigation at a likely and strategic location in the watershed. The fee charged is based on a pre-approved fee schedule designed so the program will be able, over time, to cover the likely cost of completing the mitigation.

Developers generally like the convenience of an in-lieu fee program. It allows them to simply pay the fee and move on to completing construction of their project without getting involved in environmental work with which they may be unfamiliar and without the long-term oversight, monitoring, approval process, and legal liability that may extend long after their construction project is completed. This may be especially true for small developers. And it may be especially useful for smaller projects that fall outside of the regulatory authority of the Corps of Engineers.

And there may be benefits for environmental cost effectiveness – in that such a program may result in spending and mitigation that is more strategic and that is directed at the most significant needs in the watershed. The significance for agriculture is that, especially for values other than the acre-for-acre replacement of wetlands, the existence of an in-lieu fee program seems likely to create a potential market for environmental services that they can supply.

Such fee-in-lieu programs already exist in many places in the Northwest and around the country.<sup>45</sup> The Puget Sound Partnership is considering creating such a program. And the State of Oregon has had such a program for several years.

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## F. Possible issues for Pacific Northwest Agriculture

In one way or another, the agriculture industry has been a “supplier” in many of the known conservation markets that have emerged around the country – though not in all. There are lessons to be learned from those experiences. Appendices A, B, C, and D to this discussion paper contain summaries of examples of such participation and illustrate how these markets might be best designed to make them work for agricultural producers.

Review of these examples suggests several issues that may deserve attention and discussion in the approaching Workshop/Listening Session. These include:

- **Length of contract commitment – avoiding long-term obligations:** Success for many agricultural businesses can depend upon their ability stay flexible in their use of the land so they can adapt to changing needs in a shifting market. Long-term contract and other obligations might reduce that flexibility.

Conversely, some conservation activities may require a significant initial investment – either financially or in self-education, preparation, and in integrating the changes into an ongoing successful farming operation. In such a case, a landowner might want a long term commitment that will justify this initial investment.

One of the potential roles an aggregator might play can be to translate long-term obligations to large buyers into short-term obligations for farmer or rancher suppliers of services.

- **Price and price structuring:** Farmers are in business so the price offered for the services they can supply will generally be a significant consideration. Some will certainly act, at least partly, out of community altruism. But, for purposes of creating a genuine marketplace, it is important to treat the price as the significant motivation for participating.

The price offered should be clear and easy to understand so individual farmers can easily assess what they might earn. There are various ways a market can be structured: Farmers might individually negotiate their compensation. They might be offered a simple schedule of services and payments. They might be paid by performance, in a lump sum, or over time. Or they could simply be asked to apply with a competitive offer.

- **A workable “baseline” with allowance for early adopters:** A conservation market supplier can only sell those services that actually add new value to an existing “baseline” of environmental performance generally accepted in the community. This baseline needs to be set at a level that realistically assesses current performance and that is not so high as to exclude most new services farmers and ranchers might be able to provide.

Closely associated with the baseline issue is whether those landowners who have already adopted good conservation practices on their land will be excluded because paying for their conservation activities will not add new benefits for the environment. If early adopters cannot be included directly in the market, perhaps we need a separate compensation system to assure that early adopters also receive compensation for the services they provide.

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- **A trusted point of contact for producers:** Agricultural producers would generally prefer to deal with an agency or organization that is known and trusted and that they feel will represent their best interests. This will be especially true for those entering a new, unfamiliar area like a conservation marketplace.

And the aggregator or technical service provider will be more effective if they have experience with and are supportive of the agricultural producers that provide the supply of services. Several farm organizations are already involved in the carbon market around the country. And some of the aggregators are already specialized in dealing with agriculture.

- **An effective “aggregator:”** There is an important role for an aggregator that can provide an interface for large buyers in dealing with a multitude of small, individual farm, ranch or forest landowners in assembling their services into a single, larger, market significant deal – a prospect which, otherwise, could be seem unmanageable for the buyer.

Aggregators can also help break long-term obligations to buyers into shorter-term contracts with farmers and might also be able to spread lump sum payments into long term obligations if that is preferred. Farmers could work with existing aggregators or they might decide they want to use or to create new, farmer-led organizations to fill this role.

- **A strong source of technical assistance and support:** Producers will have limited time to spend learning about and understanding a conservation market. A conservation market will benefit from involving an institution that can provide technical assistance and experienced facilitation for transactions with producers.

For carbon markets, some of the technical assistance seems to come from the aggregator. For water quality markets, conservation districts seem to usually fill this role. For mitigation markets, there does not, so far, seem to be a single clear source of such assistance although mitigation banking firms and consultants may be serving in this way. This, again, is an area where farmers and ranchers can define how they would prefer to operate.

- **Investment cost:** Practices or services that require high initial investment costs will probably discourage agriculture participation unless the long-term benefits are substantial. Agricultural landowners may find it difficult to find investment capital and may be hesitant to become dependant upon a conservation market for its long-term repayment.

Having access to low interest loan capital for investments of this kind by farm and ranch landowners might be helpful. Who might make those loans? Would this be a place where state or federal grant, loan, and loan guarantee programs could help?

- **Availability at the right locations:** Many conservation markets are only available to suppliers in limited geographic areas. There must be enough farmers in that area who might be interested, or the market cannot work. To truly work for agriculture, these markets probably need to be available over the broadest possible areas so as to include as many potential suppliers as possible.

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Even though some of these markets (water quality or mitigation, especially) tend to be local, it still seems quite possible that a single statewide or regional organization, friendly to agriculture, could serve a role as aggregator, technical service provider, and/or negotiating agent for individual farmers in conservation market transactions and could serve the role of identifying and facilitating deals of many kinds across watersheds and for large regions.

- **Agriculture participation in creating and operating the marketplace:** If the agriculture industry is to become an active participant in a marketplace, it should be involved early in its design and, wherever possible, kept involved in key decisions of operational management. Supportive agriculture groups can help provide outreach to their membership, engage the interest of potential suppliers, and help in the policy arena.

How can we draw the broadest possible interest and involvement by the Pacific Northwest agriculture industry in helping to guide the emergence of these markets in our region?

- **Familiarity of conservation practices employed:** The agriculture community largely understands and trusts the concept of BMPs because they appreciate that their use is typically, at least in part, aimed at also improving the farm business. New or unfamiliar practices or requirements are likely to be suspect.

Conversely, it is probably important that there be freedom to experiment and find innovative ways to supply these markets that do not prejudice the continuation of viable agriculture.

- **Reasonable monitoring:** Private landowners generally hesitate to allow regulators or other official or semi-official monitoring and inspection to take place on their land. Market arrangements that minimize this kind of intrusion are likely to be more appealing. And inspections done by competent private or non-government-enforcement personnel are likely to be preferred.

On the other hand, if the monitoring is efficiently and professionally done, is clearly tied to the legitimate needs of the transaction, and if the compensation is sufficient to cover the time and inconvenience, most agriculturalists may simply accept reasonable inspection as a part of doing business.

- **Protecting the agricultural land base:** High quality agricultural lands are rapidly fragmenting and disappearing. This undermines the critical mass of agriculture needed to support suppliers, processors, and service businesses and it makes it difficult for farmers to find and afford farmable and productive land. There will be limited tolerance for conservation markets that take quality land out of traditional agriculture and limited interest by individual landowners in practices that require them to do so on their land.

Some kind of State agricultural lands policy that sets limits and establishes appropriate process and standards for this is probably needed if the agriculture industry is to readily accept and affirmatively support widespread conservation markets.

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- **Consistency/dependability of market:** A marketplace that is dependably institutionalized and can be relied upon to remain in place over time will be preferred.

Even though they may hesitate to embrace long-term contracts, farm, ranch, and forest landowners will want to incorporate the use of such markets into the extended planning for their business operations.

- **Variety in opportunities for participation:** Each farm offers unique possibilities to implement conservation practices. If it is to enlist broad participation from producers, a market will need to offer payment for a broad array of practices so that as many farmers as possible can find ways to participate. Moreover, some practices (like those involving buffers, for example) may be difficult to obtain. Others may be easier.

Markets that seem to provide opportunities for many farm operations of many different types might expand the availability of supplies from farmers and increase the popularity of these markets.

## **G. Summary and conclusions:**

Conservation markets of various types are already emerging around the country and here in the Pacific Northwest. And it now seems almost inevitable that the agriculture industry is likely to become involved in these markets as an environmental service supplier. This raises important concerns that need to be addressed if these markets are to work to the benefit of both agriculture and the environment.

Fortunately, a great many markets have already developed or are developing around the country. These provide strong models from which to draw ideas and from which to learn. There is also a wide and increasing array of possible opportunities for agriculture to participate depending on how these markets evolve in the years to come. This may or may not develop in ways that will be helpful for agriculture.

It therefore seems clear that engaging the interest and active involvement of the mainstream agriculture industry in shaping the development of conservation markets is an essential first step to these markets becoming a useful reality.

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## ENDNOTES

<sup>1</sup> Robert T. Lackey, *A salmon-centric view of the 21<sup>st</sup> century in the western United States*, *Renewable Resources Journal*, Autumn 2003, at p. 14.

<sup>2</sup> Puget Sound Salmon Recovery Plan, adopted by NOAA Fisheries January 19, 2007, *Proposal for Prosperity of Farming and Salmon*, p.411. [http://www.nwr.noaa.gov/Salmon-Recovery-Planning/Recovery-Domains/Puget-Sound/upload/Ch6\\_Hab\\_Farm.pdf](http://www.nwr.noaa.gov/Salmon-Recovery-Planning/Recovery-Domains/Puget-Sound/upload/Ch6_Hab_Farm.pdf).

<sup>3</sup> Cascade Land Conservancy's *Cascade Agenda*, Ch. 3, pp. 1-14, The Communities that Define Us: Our Agricultural Lands. <http://www.cascadeagenda.com/picturing-the-cascade-agenda/the-cascade-agenda/the-report>

<sup>4</sup> "Salmon-Safe" certified farm products (see Stewardship Partners at: [http://www.stewardshippartners.org/prog\\_salmon.html](http://www.stewardshippartners.org/prog_salmon.html)); Food Alliance products; and, "Northwest Certified Forest" products (see Northwest Natural Resources Group at: <http://www.nnrg.org/nw-certified-forestry/nw-certified-forestry>) are immediate, local examples.

<sup>5</sup> On June 18, 2007, the Business and Biodiversity Offsets Program (BBOP) with the Katoomba Group and the City of Bainbridge Island held a conference at IslandWood on Bainbridge Island that focused on these issues. See: [http://www.forest-trends.org/newsletters/BBOP\\_misc/20070424.html](http://www.forest-trends.org/newsletters/BBOP_misc/20070424.html).

<sup>6</sup> In the U.S., carbon credits are traded through the Chicago Climate Exchange (CCE). Some of the specific contributions that can be made by agriculture have already been defined and described. See the CCE site at: <http://www.chicagoclimatex.com/content.jsf?id=23>. The Portland-based Climate Trust also has an open request for proposals from potential suppliers of carbon sequestration. See: <http://www.climatetrust.org/solicitations1.php>.

<sup>7</sup> For a description of the Kyoto Protocol, see: [http://unfccc.int/kyoto\\_protocol/items/2830.php](http://unfccc.int/kyoto_protocol/items/2830.php).

<sup>8</sup> See the description of PNW Direct Seed's carbon sequestration program in Appendix A.

<sup>9</sup> See comments at WSU's Center for Sustaining Agriculture and Natural Resources "Climate Friendly Farming" website at: <http://cff.wsu.edu/Project/dairy.html>. Also see examples in Appendix A.

<sup>10</sup> See the description of Rangeland Soil Carbon Management Offsets at the Chicago Climate Exchange site: <http://www.chicagoclimatex.com/content.jsf?id=1101>. Also see Appendix A.

<sup>11</sup> See Northwest Natural Resource Group's "Northwest Neutral" website at: <http://www.nnrg.org/innovations/NW-Neutral>.

<sup>12</sup> WSU's Center for Sustaining Agriculture and Natural Resources (CSANR) is studying, for example, projects in irrigated agriculture. See: <http://cff.wsu.edu/Project/irrigated.html>.

<sup>13</sup> See WSU research – *ibid*.

<sup>14</sup> See Appendix B.

<sup>15</sup> 33 U.S.C. Ch. 26. See: <http://www.access.gpo.gov/uscode/title33/chapter26.html>.

<sup>16</sup> National Pollution Discharge Elimination System (NPDES) permitting is explained at: <http://cfpub.epa.gov/npdes/>.

<sup>17</sup> §303(d) of the Clean Water Act is the section that provides for identification of water bodies that do not meet established pollution standards under the Act. TMDLs are established for excessive pollutants and are generally allocated among point source contributors for those pollutants with each point source receiving a specific "load allocation" which it is required to meet as a condition of its NPDES permit.

<sup>18</sup> See the USDA/Natural Resources Conservation Service (NRCS) Field Office Technical Guide – described on line at: <http://www.nedc.nrcs.usda.gov/catalog/introfotg.html>.

<sup>19</sup> For examples of wetland mitigation markets, see APPENDIX C.

<sup>20</sup> §404 of the Clean Water Act - <http://www.usace.army.mil/cw/cecwo/reg/sec404.htm>.

<sup>21</sup> See, e.g. the Washington Shorelines Management Act, RCS 90.58.

<sup>22</sup> Presentation by David Dicks, Executive Director of the Puget Sound Partnership at a "Wetlands in Washington" seminar held October 25-26, 2007 at the Renaissance Seattle Hotel sponsored by Law Seminars International. <http://www.lawseminars.com>.

<sup>23</sup> See Appendix D.

<sup>24</sup> Endangered Species Act of 1973 (7 U.S.C. § 136, 16 U.S.C. § 1531 et seq.)

<sup>25</sup> See Appendix D.

<sup>26</sup> Izaak Walton League website at: <http://www.iwla.org>.

<sup>27</sup> Ducks Unlimited website at: <http://www.ducks.org/>.

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<sup>28</sup> See: The Use of Markets to Increase Private Investment in Environmental Stewardship, (USDA Economic Research Service – September 2008) on line at: <http://www.ers.usda.gov/Publications/ERR64>.

<sup>29</sup> As of June 2008, there had been 13 bills introduced in Congress that might create a federal framework for addressing climate change. See Appendix E.

<sup>30</sup> See Appendix B.

<sup>31</sup> See Appendix A.

<sup>32</sup> See the USDA/Natural Resources Conservation Service (NRCS) Field Office Technical Guide – described on line at: <http://www.nedc.nrcs.usda.gov/catalog/introfotg.html>.

<sup>33</sup> See, especially, Appendix B.

<sup>34</sup> See the USDA Economic Research Service site on RUSLE at: <http://www.ars.usda.gov/Research/docs.htm?docid=5971>.

<sup>35</sup> See, e.g., the Michigan State University site at: <http://www.iwr.msu.edu/rusle/>.

<sup>36</sup> See Appendix D.

<sup>37</sup> See “Meeting Summary” (pg. 3) for the 12/18/07 meeting of the Washington State Department of Ecology “Mitigation that Works” process (posted at 1/15/08 meeting):

[http://www.ecy.wa.gov/programs/sea/wetlands/mitigation/forum/pdf/jan15\\_08/summary\\_12-18-07.pdf](http://www.ecy.wa.gov/programs/sea/wetlands/mitigation/forum/pdf/jan15_08/summary_12-18-07.pdf).

<sup>38</sup> See Appendices C and D.

<sup>39</sup> For example, where a TMDL is anticipated but not yet in place, it seems possible a farmer might implement conservation practices in anticipation of a likely market in the future.

<sup>40</sup> This is, apparently, a nationwide problem. See “The Status and Character of In-Lieu-Fee Mitigation in the United States” (Environmental Law Institute, June 2006) pg. 53. This report can be downloaded for free from the ELI website at: [http://www.elistore.org/reports\\_detail.asp?ID=11151](http://www.elistore.org/reports_detail.asp?ID=11151).

<sup>41</sup> In 2007-08 there was public outcry about Washington DOT plans to purchase (or perhaps condemn) a nearby farm in the vicinity of the widening project on the Guide Meridian (SR 539) highway from Bellingham to Lynden in Whatcom County, WA. See: <http://www.wsdot.wa.gov/projects/SR539/tenmileborder>. And there has also been controversy over a planned wetland mitigation bank for a site on farmland in Skagit County, WA. See: “Preservation with a profit,” Christopher Schwarzen (Seattle Times, 11/1/06) at:

[http://seattletimes.nwsourc.com/html/snohomishcountynews/2003332953\\_wetlands01n.html](http://seattletimes.nwsourc.com/html/snohomishcountynews/2003332953_wetlands01n.html).

<sup>42</sup> Federal Farmland Protection Policy Act, 7 USC §4201ff.

<sup>43</sup> See Washington Department of Ecology’s “Mitigation that Works” website at: <http://www.ecy.wa.gov/programs/sea/wetlands/mitigation/forum/index.html>.

<sup>44</sup> On 3/31/08, US EPA and the Corps of Engineers issued new rules that increase the priority of “fee-in-lieu” programs. See: <http://www.epa.gov/wetlandsmitigation/#regs>.

<sup>45</sup> King County, for example, has such a program, although it does not appear that it has yet been used to purchase conservation services from local farmers. See the Meeting Summary for the Mitigation that Works process for March 18, 2008, pg. 7 and presentation by Clint Loper of the King County Department of Natural Resources at: [http://www.ecy.wa.gov/programs/sea/wetlands/mitigation/forum/pdf/mar\\_08/MTW\\_Mar%2018%20Meeting%20Summary%20\\_final2\\_.pdf](http://www.ecy.wa.gov/programs/sea/wetlands/mitigation/forum/pdf/mar_08/MTW_Mar%2018%20Meeting%20Summary%20_final2_.pdf). The Puget Sound Partnership is also looking at ecosystem markets as a part of the clean-up effort in Puget Sound (see the presentation delivered by Jim Cahill at the Ecosystem Services Markets Conference put on by Northwest Environmental Business Council in Portland, OR on May 22, 2008 at: <http://www.nebc.org/Documents/Ecosystem08/4-Cahill.pdf>) including a possible fee-in-lieu program. Also, see examples in APPENDIX A.