# How Environmental Markets Can Preserve Agricultural Lands While Helping to Protect the Environment

**by**
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***Summary:***
Emerging markets for ecosystem services (referred to here as "environmental markets") promise benefits, both for agriculture and for the environment. For the environment, these markets offer several direct enhancements in environmental performance. For farmers and ranchers, they offer diversified and potentially increased earnings and a way to be paid for greatly improving their environmental performance and reducing environmental risk.

But, in addition to these benefits, one key frequently ignored feature of environmental markets is their capacity to help keep farmland in active, working agriculture and out of environmentally harmful sprawling development. This paper is designed to discuss the specific farmland protection aspects of environmental markets and to explain why environmental market participation by working farms is good for agriculture, for the environment, and for society.

It must be noted that environmental markets can also create pressure to remove farmland from agriculture. A companion paper entitled: "Maximizing Opportunities for Farmland Protection in Environmental Markets" addresses some of the specific farmland preservation challenges for environmental markets, identifies some ways to respond to them, and identifies models for farmland preservation in environmental markets from around the country.

***Farmland loss in Washington State:***
Roughly 74% of the agricultural lands in the State of Washington have a fair market value significantly in excess of their agricultural business use value.[1] These lands are at risk of conversion to more intensive, non-farm uses in the years ahead.[2] The problem clearly exists statewide,[3] but it seems likely that these losses will be most significant, especially as a percentage of farmland available, in areas near our urban centers.[4] The lands that are the most vulnerable tend to be those lands which have the best soils and are also the most versatile and productive for agriculture. These, too, are typically located nearest our urban areas.[5] This raises concerns about the sustainable economic health of our agriculture industry, about citizen access to fresh and local food, and about future environmental quality in our region.

We are losing agricultural lands in Washington at a rate of about 75,300 acres per year.[6] And the differential between agricultural business value and fair market value of our state's farmland is steadily increasing.[7] So our primary tools to address this problem are obviously failing. The maximum parcel sizes protected under our Washington Growth Management Act (GMA) are 35 or sometimes 40 acres, with a good deal of agricultural land grandfathered in at much smaller

parcel sizes, or directly zoned at 20, 15, 10, and even 5 acre parcels. This is in a State where the average farm is size 381 acres.[8] Moreover, much of our current active farmland is not zoned for agriculture. And several of our more rural (and most agricultural) counties have "opted-out" of GMA and are not required to comply with many of its requirements. Certainly our GMA helps. But it does not appear to be sufficient to the need, and statutory changes that would make it more rigorous do not seem politically likely in the foreseeable future.

The State of Washington also protects some limited farmland from development by purchasing agricultural conservation easements – often with financial assistance from the Federal Farm and Ranchlands Protection Program (FRPP). But our State-funded program is relatively new and severely under-funded.[9] There are a handful of counties that are acquiring such easements with county funding,[10] often also with the help of the State and Federal programs. Private land trusts also protect a good deal of land with charitably donated easements.[11] But all of these programs, taken together, still do not begin to address the true magnitude of the need.[12]

Given anticipated population growth in the Pacific Northwest,[13] pressure to develop farmland seems likely to continue and to increase in the years ahead.

***Environmental consequences of farmland loss:***
Washington farms provide aquifer recharge, wildlife habitat and migration corridors, surface and ground water filtration, flood water detention, carbon sequestration, and a host of other environmental services. Many of these services can be enhanced with improved management, but even with little attention to environmental quality, the environmental values provided are substantial. This is not to mention the significant carbon benefits of keeping our rural lands rural and thereby reducing transportation impacts on climate. So the loss and fragmentation for our farmland has grave consequences for the environment. Many of our wetlands are on farms. Many of our salmon bearing streams and rivers are bordered by farms.[14] In Snohomish County, for example, some 80% of the designated agricultural lands are in the floodplain.[15] About 35% of Skagit County's roughly 100,000 acres of farmland is dike-protected, located below the mean high tide line.[16] For these and other reasons, the NOAA Fisheries Puget Sound Salmon Recovery Plan specifically found that saving our farms is necessary if we are to save our region's salmon.[17] The 50-year Cascade Agenda for central Puget Sound concludes the same thing – we need to save our farms if we are to preserve a healthy environment.[18]

Beyond what they do just by virtue of their existence, however, our farms also represent our greatest opportunity for making significant improvements in the environment. Consider the alternatives: The potential for environmental "lift" within urban and already developed areas seems limited and very costly. And our public lands are, at least generally, already managed to maximize environmental value, so the chances for substantial gains in environmental quality there also seem slim. So our private farm and forest lands, which, together, represent over half of the total Washington land base (over 2/3 of our private lands),[19] are likely to continue to provide the best chance for cost-effective environmental gains – cost-effective so long as those lands remain in working agriculture.

As well as placing our farms under development pressure, anticipated population growth also seems likely to heighten future environmental challenges faced by farmers as it will for the rest of us. Growth means development. More people mean increased environmental impacts. Society will certainly attempt to avoid and to minimize the environmental impacts of growth. But however hard we try to avoid environmental damage, there will also be a clear and growing need to find areas where environmental improvements are possible that can offset or mitigate for the impacts of development and other increases in human activities. So our farms will probably continue to be in the crosshairs as we look for those opportunities for environmental lift.

Some of the needed improvements in environmental performance are likely to be demanded through increased regulation. But there are limits to the regulatory burdens we can appropriately (or fairly) impose on the owners of our state's private working lands. While private farm and ranch lands represent about 50% of our State's private lands, there are only about 39,000 farms in Washington.[20] So farm owners represent only a very tiny percentage of Washington's six million residents. And this is not a wealthy segment of our population.[21] With most of our farmland already worth more for development than for agriculture, excessive regulation can easily be the final factor that drives farmers out of business and off the land[22] resulting in a counterproductive fragmentation of the land base, an increase in the intensity of land use, and a worsening of regional environmental quality.[23]

There are also limits to the extent that "restoration" activities can be mandated through regulation, both practical and legal.[24] And it seems clear that to obtain the environmental lift needed, positive restoration projects and new, affirmative changes in future activities on our state's private lands will be required.

***Emerging environmental market opportunities:***
Securing adequate funding for conservation incentives or for direct land protection on private agriculture has consistently proven a challenge. Governments are often unable or unwilling to appropriate adequate taxpayer money for these uses. So it seems both wise and responsible that we look to private sources and market structures for meaningful resources that can help us achieve serious environmental and land protection gains.

In general theory, an environmental market becomes possible when government regulation and public expectations place limits on acceptable damage to an environmental value and when there is strong economic pressure making such damage likely to occur. Given the ever-increasing pressures from growth and development, and considering the amounts of money already being spent in existing environmental markets,[25] these markets seem likely to grow and to generate substantial revenue in the years ahead.

The environmental markets that are beginning to emerge around the country hold great promise as a tool to help address these losses of farmland as well as to achieve other environmental objectives. We already have such markets in wetland banking, carbon sequestration, renewable energy, and water quantity, and they are growing. Markets are also beginning to emerge for water quality trading and habitat conservation. And other possibilities, like flood mitigation and transfer of development rights appear to be realistic possibilities. Preserved farmland can also

serve specific infrastructure needs for growing urban communities. For example, the New York City Watershed Program pays for perpetual easements on Watershed farms because that is one of its surest ways to provide the long-term assurance of water quality needed for the City's drinking water supply. Similarly, The City of San Antonio, TX, protects farms in the Edwards Aquifer for the same reason, to assure protection of their drinking water.

These and other examples are spelled out in Appendix A to the companion paper mentioned above ("Maximizing Opportunities for Farmland Protection in Environmental Markets") and in the recent Conservation Markets Feasibility Study commissioned by the State of Washington last year. [26]

***The cost benefit of keeping land in active agriculture:***

Active, working agricultural lands have a significant cost advantage in supplying enhanced environmental services in that they can do so while continuing to earn income from their farming operation. A host of conservation management practices developed in over seventy years of concentrated effort by USDA's Natural Resources Conservation Service[27] and by local conservation districts provide a scientifically sound body of knowledge that makes this possible.

Landowners who can supply ecosystem services while continuing to farm need only earn, from their environmental market transaction, sufficient revenue to supplement their ongoing income from agriculture. This allows them to provide ecosystem services at a lower cost to the buyer than would be the case if the environmental market payments needed to provide the entire natural resource income from the land involved. Protecting farmland for the long term can, therefore, be entirely consistent with the needs of both ongoing agriculture and the needs of a potential buyer in an environmental market.

***Potential land protection impacts of environmental markets:***

If our state's farm, ranch and private forest businesses become suppliers of ecosystem services in emerging environmental markets, the supplemental revenue that could be generated will clearly help improve their profitability and slow the sale and fragmentation of the land. But, beyond just the indirect benefits of stronger farm profitability, there are also more direct ways one can anticipate that these markets might help protect working natural resource lands.

When farm and forest landowners contract to provide environmental services, the buyer will generally need assurance that those services can continue to be provided over time. So the ongoing availability of the land on which they are generated is likely to be dealt with (and presumably paid for) through contract negotiations.[28] Where purchase of the environmental services is driven by a need to replace environmental functions that have been permanently destroyed, the marketplace will dictate the purchase of permanent protection – such as perpetual conservation easements from participating landowners. Where the environmental qualities being replaced are less permanent, replacement may be shorter term – such as the length of a National Pollution Discharge Elimination System (NPDES) permit or a municipal services planning horizon. Sometimes, aggregators and other market institutions will independently provide the long-term assurances that buyers require, thus reducing the need for extended contracts with individual landowners. But, even when farmers deal with aggregators, market pressure for

certainty over time seems likely to produce a price-premium for longer landowner commitments. Among the anticipated benefits should be a slowing of the loss, sale, and fragmentation of agricultural lands.

The need for certainty over time will differ, depending upon the particular market or circumstance. For example:

- The conservation practices involved might drive the need for certainty. A forest landowner selling carbon credits who desires to receive full value for the carbon sequestered in growing wood might need to provide assurance that newly planted trees would be allowed to grow to their identified maturity or that an extended harvest rotation would, in fact, be allowed to play out for the projected extended period. A grain farmer might benefit from a higher price by providing assurance that a newly implemented limited tillage practice would continue for a sufficient number of years for it to achieve its optimal soil sequestration benefits. Or a landowner selling riparian shade to reduce water temperature might be asked to assure that newly planted trees would be allowed to grow to sufficient size that they could provide the anticipated shading.

- The level of investment might dictate a longer term contract. The cost of building a new dairy waste anaerobic digester and power generation facility can run between $1.5 million to $3 million – a substantial sum for even a sizable dairy operation. A farmer might be unwilling to make such an investment unless he or she can be confident that they have a long-term contract at a good price for the power that they produce and the carbon they sequester and are thus committed to remain in agriculture for a lengthy time period.

- The buyer's business plan might drive assurances of an on-going relationship. A municipal waste water treatment facility that serves a growing suburban community may only have an immediate need for a 5-year NPDES permit. But it may also need to anticipate increasing demand for the services of its facilities over at least a 20 plus year planning horizon. So it may be helpful if water quality trading contracts with upstream farmers can provide assurances of their continuation for a lengthy time period – and worth paying extra for these assurances.

The extent to which the landowner must provide extended certainty may depend upon the availability of aggregators or other market institutions – which is, in turn, more likely in a more active, mature marketplace. For example:

- A carbon credit buyer might need a 20-year contract, but participating farm landowners might prefer to make no more than a 5-year commitment. A respected aggregator can make that 20-year commitment and then fulfill it through a series of continued contract renewals and replacements with participating farm landowners, none of whom are individually required to enter more than a 5-year contract.

- A food processing plant that needs extended assurances to comply with its National Pollution Discharge Elimination System (NPDES) permit might only have a handful of eligible

upstream farmers with whom to potentially deal. So there may be no aggregator available. In such a case, the permitting agency might agree to the food processor establishing (and providing assurances for) continued maintenance of sufficient services. But the permitting agency might also require longer contracts and the food processor would need to satisfy those certainty requirements. So participating farmers would probably be asked to provide (and be paid for) longer-term contract agreements.

Environmental mitigation for direct damage to the land will generally require permanent land protection. In these cases, the damage is permanent, so the replacement of or mitigation for that damage must also be permanent. For example:

- A farmer, a portion of whose land is wet and non-productive for agriculture, might contract with the highway department to restore that area into a wetland that can take the place of wetlands that are being destroyed by a nearby highway project. In such a case, these replacement wetlands will need to be protected by perpetual easement.

- A new shopping mall might need to pave an area of roosting/feeding habitat for a migratory bird species threatened under the Endangered Species Act. As mitigation, the owner of a ranch, also located along the birds' migration flyway, might be paid to implement bird-friendly management practices (while continuing to run livestock) and to provide a perpetual conservation easement. This transaction assures continued future availability of the ranch property for use both for livestock and by the birds thus helping to slow species decline and making up for any acceleration caused by the construction of the new mall.

***Role of land trusts and farmland protection programs:***
There are a great many groups and constituencies with a powerful interest in assuring that emerging environmental markets help protect agricultural lands for agriculture. They could have a considerable impact if they were to become active in these markets. Potential roles for groups with an interest in farmland preservation might include:

- Supporting land trust stewardship: Clearly, environmental markets seem likely to provide revenue that will support farm easement acquisitions. Many of those easements will probably end up under stewardship provided by private land trusts or existing purchase of development rights (PDR) programs. Presumably, these opportunities will arise from creative partnerships with existing easement purchase programs, or will emerge when the availability of a environmental market supports a land trust acquisition project, charitable or otherwise.[29]

- Supporting land trust ownership: At times, land trusts (and perhaps PDR programs) may also hold outright ownership of agricultural properties. Those instances may provide the chance to use environmental markets to provide revenue that will supplement their income and help finance their long-term ownership and sustainable management of the property.[30]

- Organizational priorities: Land protection agencies and organizations establish their own internal priorities for which lands they will seek most vigorously to protect. These could

include heightened priority for farmlands that are also actively engaged in and committed to selling ecosystem services along with agricultural products. Such a commitment helps assure the long-term economic sustainability of the farm or ranch on the protected property and confirms that it is also generating socially needed environmental services – potentially justifying increased worthiness of organizational focus.

- Certification, monitoring, and baseline assessments: Land trusts and PDR programs are necessarily in the baseline assessment business – a requirement for their acquisition and subsequent effective stewardship of conservation easements. The environmental know-how associated with baseline assessments could, potentially, be applied as well to the certification and/or monitoring of ecosystem services to be produced for market. Certification and monitoring by a responsible and credible group is one of the essential components for any environmental market transaction.

- Advocacy: Land trusts, government land protection programs, farm groups, smart growth advocates, state and local and planners, growth management agencies and organizations, local food advocates, and the environmental community – all have a clear interest in common with farmers and environmentalists and have an important role in maximizing the effectiveness of emerging environmental markets in producing protection of the land. Their collective involvement in and advocacy for the development of these markets and for their use to protect agricultural lands (for example in some of the ways discussed in this paper) can represent a powerful and knowledgeable voice for the utility of these markets to preserve agricultural lands as well as for their environmental effectiveness.

***The environmental rationale for offsets and mitigation with agriculture:***
If land trusts and other conservation organizations are to take an active role in using ecosystem market to help preserve agricultural lands, they must be confident that their activities will represent a net environmental gain.

In purely theoretical terms, environmental markets for offsets and mitigation can be seen as environmentally neutral – that is to say, they might be thought simply to replace lost environmental values rather than to enhance them. But in actual practice, there are many direct environmental benefits to the use and availability of credible, well-functioning environmental markets. And these benefits go well beyond those that arise solely out of the protection of agricultural lands as described above.

The following list is an effort to identify the positive environmental gains that result when well functioning environmental markets can be put in place:

- Lowest cost: Cost is always an issue in securing protection for the environment. Damage to the environment can be expensive to mitigate, avoid or prevent—costs that present themselves in the form of higher taxes, increased utility charges, delayed development, and higher prices for products and services inflated by regulation. There are limits to public and political willingness to absorb such costs, yet ignoring them may ultimately be more expensive for society. When the economic cost of addressing an environmental problem becomes too high, the political will to act

tends to evaporate. Concern about cost was why the U.S. government was so slow to even acknowledge the existence of climate change, let alone to join in correcting it. It seems likely that many of the developed countries that did sign the Kyoto Protocol would almost certainly have had serious second thoughts had there been no possibility for carbon markets to moderate the economic impacts of capping emissions

Environmental markets allow the least-cost provider to sell these services to those who need them, thus reducing the cost of environmental compliance. This preserves scarce public resources and minimizes the economic impacts of environmental rules. It makes it easier, and in some cases politically possible, to secure the needed environmental protections in the first place. So effective, well run environmental services markets can therefore be seen as critical infrastructure in efforts to address many kinds of environmental problems.

- Reduced reliance on public funding to solve environmental problems: Well structured ecosystem markets can be designed to generate funding that will address environmental needs without depending on taxes and uncertain ongoing public appropriation. Environmental impacts continue (or may even increase) in challenging economic times when it is most difficult to generate tax revenue to address them.

  Environmental markets promise a funding source that is matched to the magnitude of the problem and that can be relied upon over time.

- Co-benefits: When a farm produces (and sells) one ecosystem service, it nearly always ends up producing others for free. A riparian buffer created to lower stream temperature, for example, will also reduce water pollution, improve aquifer recharge, and provide riparian habitat for fish and wildlife. Conservation rangeland management designed to sequester carbon will also preserve vegetation for birds and other wildlife and improve water quality.

  When farmers sell one environmental service, even if the net effect of the trade itself represents only an even ecosystem exchange, other environmental benefits for which there is no compensation provided, typically result in a substantial net environmental gains at no social cost.

- Enhanced environmental benefits through trading ratios: Purchasers of offsets in an ecosystem market need to be absolutely sure that they will meet the requirements of their permits. And regulators want to be certain the environment is protected. So trades are typically made at very conservative trading ratios designed to eliminate uncertainty. For example, a farmer might adopt conservation practices that remove, say, 4 pounds of nitrogen from a waterway in order for his or her trading partner to receive offset credit for 2 pounds.

  The use of such ratios means that trades almost always result in a substantial net gain for the environment.

- Improved performance of current mitigation system: Recent studies of wetland mitigation indicate that we fall well short of the "no net loss" outcome expected under the Clean Water Act—averaging less than 50 percent functional equivalency for replacement wetlands created under existing programs requiring mitigation.

Efforts are underway to improve this performance. But to the extent that these studies are suggestive of likely performance in other environmental mitigation programs, it seems highly likely that farm, ranch, and forest landowners may be able to do a better job.

- Improved strategic effectiveness of environmental spending: Current public funding for landowner conservation incentives is scarce. So incentive program managers are only able to provide highly limited "cost share" funding for participating landowners and thus can enlist participation only from mostly public-spirited landowners for whom the limited financial help is just an encouragement, not the primary motivation. This spreads conservation spending very thinly out across the landscape rather than allowing it to be focused on critical environmental problems or targeted to key geographic locations.

  Environmental markets, on the other hand, tend to put the funding where the problems are – targeting the specific problem that has required mitigation or offsets and putting the solution to that problem in the exact watershed, habitat segment, or area where the damage has been done. And with suppliers paid what their ecosystem services are worth, many, if not most potential suppliers can be motivated to provide the service. Thus program managers are able to target geographic areas, particular problems, and those specific landowner participants whose help is most needed to strategically target acquisition of the most important ecosystem services.

- Monitoring and enforcement: As mentioned above, current landowner "incentive" programs provide only limited "cost share" for participation. So the success of these programs depends on participation mostly by public spirited volunteers. It is, therefore, very difficult for program managers to demand rigorous project monitoring or to engage in vigorous contract enforcement. If they do so, they risk alienating the landowner community and driving away the voluntary participants upon whom their programs depend.

  On the other hand, a true environmental market will pay the service provider what the service is worth. Clear contracts, appropriate monitoring, full compliance, and rigorous enforcement are to be expected in such a setting – and their cost (and risk) is factored into the price paid and accepted for the service. Permittee-buyers, regulators, and the public can have confidence that they are getting what they paid for and that contracts will be fulfilled.

- Certainty: Environmental service buyers are typically very large point source polluters or other large, highly concentrated development projects. Offsets or mitigation for these concentrated impacts that are purchased from farmers will come from many diverse sources of supply spread widely across a landscape. For example, a point to non-point source water quality transaction might replace a single highly technological infrastructure project (like a complex new sewage treatment facility) by purchasing a great many small, diverse environmental restoration projects on numerous farms widely spread throughout the upstream watershed. One glitch in the costly and complex new sewage treatment plant could potentially create massive pollution issues almost in an instant. While, conversely, the failure of any one or small number of the many restoration projects from which offsets might have been purchased may only create a minor concern – and one that can easily be avoided in advance by simply pooling enough additional projects to make up for any potential risk.

In effect, participation of a great many small environmental service providers, like farmers, can provide a much more natural solution to the problem and a great deal more certainty for regulators and for buyers than would the single, large technological infrastructure fix which might have been the alternative answer.

- Slowing the loss of agricultural lands: While it has been discussed earlier in this paper, farmland protection deserves to be on this list. With each passing day, America's farmlands are fragmented up into smaller and smaller parcels as farmers compete for land with more land-intensive non-farm uses and as land prices are driven much too high for an otherwise-profitable farm business to afford. Rural communities are losing critical agriculture industry business infrastructure like farm equipment suppliers, feed stores, farm services, lenders, and farm product wholesalers and processors. Surviving farms are undermined in a vicious cycle of farm failure and the fragmentation and intensified competition for land. And the public funding needed to protect these lands is slow to appear.

  Stable, financially sound ecosystem markets could provide supplemental income from an alternative market and help producers stay in business and provide a premium for those producers willing to make long-term investments and to stay on the land in active agriculture. Funding for easement protection of working lands should become a factor of the market price. The resulting environmental quality – regardless of individual farmer participation in environmental markets – becomes a substantial environmental gain. And we should see reduced reliance on public appropriation for farmland protection.

- Increased community support for, and connection to, agriculture: International sources for most agricultural products have led to a public perception that local communities no longer need local farms. Much of the public believes their food can come from anywhere and that our farms are dispensable. Suppose, however, that the continuation of urban growth and economic prosperity depended upon the help of local farms to mitigate for environmental impacts. An economically viable farm industry that keeps land in agriculture and out of development can supply these critical ecosystem services at a reasonable price. Moreover, an agriculture industry that is actively engaged in supplying ecosystem services will, necessarily, improve its own environmental performance.

  The existence and success of this industry, in such circumstances, seems likely to be seen as a public necessity rather than just an option.

- Growth and economic prosperity: As mentioned above, no one wants the environmental consequences of our growth to place a heavy burden on future generations. But neither do we want to prevent those consequences in ways that unnecessarily limit our economic prosperity. So it is critical that we aggressively seek out the most cost efficient ways to address our nation's environmental problems.

  Rather than dampen our economy, limit our choices, or stymie opportunity, ecosystem service markets provide a way to minimize those economic burdens, to fully appreciate their cost, and to make responsible decisions in protecting our future. Society's environmental and economic fate become intertwined, with each increasingly seen as dependant on rather than as independent of the other.

- Local food from local farms: Ecosystem markets will be strong in communities with the most growth and where greatest environmental damage is occurring. So they may be particularly helpful in preserving those farms that are currently the most threatened by development. Farms that are nearest to urban areas may also be in a good position to help maintain urban-consumer connections to the sources of their food and to stimulate urban political support for protecting agriculture.

- Establishing a "dollar value" for a healthy environment: Currently, the value of ecosystem services is vague and uncertain, typically measured only by academic "cost replacement" studies and "willingness to pay" surveys. So it is easy for society to shrug them off, for regulators to ignore them, and for markets to treat them as worthless "externalities." When, however, these services are actively traded and acquire a concrete measurable market price that people regularly and willingly pay, their value is easy to document. And it becomes much more difficult to pretend these services have no worth.

  Strong environmental markets seem likely to strengthen the social and political case for protecting the scarce and important values provided by the environment.

- Fairness in allocating the burdens of environmental protection: As mentioned above, the lack of accepted and credible measures for the value of environmental services tends to prevent the loss of those services from being taken seriously. And there are political consequences as well: On the one hand, in the absence of clear indicators of economic impact, it may be politically easy to require a small, underrepresented regulated industry to shoulder an unfair share of the cost burden of environmental protection. On the other hand, it may also be possible for an irresponsible but politically powerful group to avoid its share of environmental responsibility.

  Once, however, environmental services acquire a known value reinforced daily in an open, public marketplace, and the financial impact of such regulation becomes clear, regulatory unfairness also becomes clear. The burden of assuring the continued availability of those services will be much more likely to be shared among all those causing their loss or benefiting from their prevention or mitigation.

- Social equity: Environmental markets assure the fair allocation of environmental burdens for another reason as well. Because they focus on ecosystems, these markets address each environmental problem at the level of community in which it exists. Climate change, for example, is obviously a global concern. So the buyers and sellers are global. Pollution in an estuary basin (like the Chesapeake Bay or Puget Sound for example), or in a particular river, will be addressed by the community in that watershed. Habitat for a troubled fish or wildlife species will be addressed in the habitat segment affected.

  Thus, the community whose activities are most responsible for creating a problem also ends up as the community with the most to gain by solving it and the community that bears most of the cost.

***Conclusion:***

For all of the above reasons, environmental markets with agriculture represent a considerable opportunity to protect our environmental future. They can help us improve the environment

while minimizing burdens that could slow our economic prosperity. They will help us protect our critical and disappearing agricultural lands. They will improve our farmers' environmental performance. And they seem likely to enhance the profitability and economic sustainability of our struggling agriculture industry.

These desirable outcomes will not, however, happen on their own. The active and knowledgeable involvement of farmers, ranchers, local food groups, land protection advocates, and the environmental community is needed if these markets are to be designed so as to ameliorate pressures to remove land from agriculture and to maximize both their opportunities for farmers and their substantial benefits for the environment.

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(Note: This document was originally written for and published by American Farmland Trust and is on line at: http://www.farmland.org/environmentalmarkets. The above version has been updated.)

## Notes:

[1] According to Washington State Department of Revenue (WSDOR) statistics (http://dor.wa.gov/docs/reports/2009/Property_Tax_Statistics_2009/Table_19.pdf), in 2008 there were 11.1 million acres enrolled in current use taxation in WA – which provides tax relief for farm landowners whose land has a market value in excess of its agricultural value. The USDA 2007 Census of Agriculture estimates total Washington agricultural acreage at about 15 million acres - http://www.agcensus.usda.gov/Publications/2007/Online_Highlights/County_Profiles/Washington/cp99053.pdf. On average, the agricultural value of these 11.1 million acres is only about 25% of actual fair market value.

[2] With the average age of Washington agricultural landowners at 57 years, many of these farms will be changing hands in the near future as their owners retire. Many more seem likely to sell for other reasons.

[3] See WSDOR county specific statistics at: http://dor.wa.gov/docs/reports/2009/Property_Tax_Statistics_2009/Table_19.pdf.

[4] One ameliorating factor is the somewhat more rigorous enforcement of Washington's growth management laws (RCW Ch. 36.70A) in some urban counties.

[5] 86% of our nation's fruits and vegetables and 63% of our dairy products are produced in areas influenced by urban sprawl. American Farmland Trust, Farming on the Edge Report. See: http://www.farmland.org/resources/fote/default.asp.

[6] Washington lost 753,000 acres between 1997 and 2007. Compare the 2007 and 1997 Census of Agriculture figures for Washington, http://www.agcensus.usda.gov/Publications/2007/Online_Highlights/County_Profiles/Washington/index.asp. It should be noted that not all of this land was necessarily lost to development. Also see: "Washington State Farmland Protection Indicators Report" Washington Office of Farmland Preservation, December 2009 Fig, 16 at: http://ofp.scc.wa.gov/wp-content/uploads/2010/02/2009-Indicators-Report.pdf.

[7] See "Washington State Farmland Protection Indicators Report," ibid, at pp 15-16.

[8] See USDA 2007 Census of Agriculture Washington Profile at: http://www.agcensus.usda.gov/Publications/2007/Online_Highlights/County_Profiles/Washington/cp99053.pdf.

[9] The Washington Wildlife and Recreation Program (WWRP) has a Farmland Protection Program that has, since the first projects were funded in 2007, probably had access to no more than about $10-12 million for easement acquisitions statewide.

[10] King County, Skagit County, Whatcom County, San Juan County, and Pierce County, have formal programs in place with at least some funding available. A few other counties have acquired easements in the past or are currently attempting to create programs, usually with very limited funding.
[11] See Washington State Farmland Preservation Indicators, Washington Office of Farmland Preservation, December 2009, pg. 39, Working Lands with Easements at: http://ofp.scc.wa.gov/wp-content/uploads/2010/02/2009-Indicators-Report.pdf.
[12] WSDOR appraisal statistics suggest that to total 2008 value of development rights on Washington farmland probably amounts to in excess of $13 billion. http://dor.wa.gov/docs/reports/2009/Property_Tax_Statistics_2009/Table_19.pdf. Total annual spending by all existing programs together is probably in the area of $10 million.
[13] By the end of the 21st Century, the population of the Pacific Northwest is projected to grow by a factor of between 3-7 times. See: Robert T. Lackey, *A salmon-centric view of the 21st century in the western United States*, Renewable Resources Journal, Autumn 2003, at p. 14.
[14] Ibid, note 12.
[15] Personal communication with Ryan Hembree, of Snohomish County's Focus on Farming Program.
[16] Personal communication with Mike Rundlett, Program Manager for Western Washington Agricultural Association.
[17] See: 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.
[18] See: 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.
[19] According to USDA (http://151.121.3.33:8080/Census/Pull_Data_Census) 15.3 million acres in Washington State are in agriculture. There are about 4.5 million acres in "industrial" forest holdings in Washington and about 3.1 million acres in "non-industrial" small private land ownership. (See 2005 Examining Washington's Working Forest Stakeholders, http://www.nwenvironmentalforum.org/forestforum/topicpapers/tp9.pdf, or about 7.6 million acres in forestry total. Since the USDA farmland figures include 1.9 million acres of pastured and non-pastured woodlands, there is obviously overlap, but it can be estimated that there are probably 20 million acres of farm and forestlands, total, in Washington State. (Note: Some of these farm and forest lands may be operated by private individuals but ownership may be in the Washington Department of Natural Resources or other public agencies.) Thus, of Washington's 43.3 million upland acres, about 19.9 million (46%) are in government ownership, and 23.4 million (54%) are privately owned. Of those 23.4 million privately owned acres, about 20 million (or 85%) are in private farm and forestry.
[20] See USDA Census of Agriculture, 2007 State Summary: http://www.agcensus.usda.gov/Publications/2007/Full_Report/Volume_1,_Chapter_2_US_State_Level/st99_2_001_001.pdf.
[21] See Ibid, USDA Census of Agriculture State Summary table. In particular see the land value and income figures for Washington agriculture.
[22] See the discussion in the 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.
[23] Ibid, notes 17 and 18.
[24] See generally the 2007 AFT report: "Creating Stronger Incentives for Private Lands Conservation in Washington" at: http://www.farmland.org/programs/states/wa/CreatingStrongerIncentives.asp. Also see: Swinomish Indian Tribal Community v. Western Washington Growth Management Hearings Board, 161 Wn.2d 415 (2007).
[25] It has been estimated that some $350 million is spent annually, just in the Puget Sound Basin alone, on environmental mitigation and that environmental mitigation accounts for between 10% and 20% of capital cost for current development projects. High-quality wetlands can run between $200,000 and $800,000 per acre. Presentation by Dennis Canty, Evergreen Funding Consultants, Focus on Farming Conference, Agriculture and the Environment Track, November 5, 2009.
[26] See the Washington Environmental markets Feasibility Study completed in January 2009 in response to SB6805: http://www.farmland.org/programs/states/wa/documents/WAConservationMarketsStudyReport_27Jan2009.pdf. Also see the Environmental markets Issue and Discussion Paper and associated appendices prepared by AFT in

December, 2008, which lays out examples of markets and market programs for farm-produced ecosystem services from around the country. Linked at: http://www.farmland.org/programs/environment/workshops/conservation-markets-november2008.asp.

[27] The product of this work is compiled in the NRCS Field Office Technical Guide – accessible on line at: http://www.wa.nrcs.usda.gov/technical/.

[28] See the "Making Mitigation Work" report and recommendations from the WA Department of Ecology's "mitigation that works" process completed in December 2008: http://www.ecy.wa.gov/pubs/0806018.pdf.

[29] For example, the Whatcom Land Trust (http://www.whatcomlandtrust.org) has worked closely with the Whatcom County purchase of development rights program under contract to provide easement stewardship for County purchased easements.

[30] The Jefferson Land Trust recently sold carbon credits on timber on a trust property it owns on the Olympic Peninsula. See: "Trees sold for carbon credits on Olympic Peninsula" Eric Hidle, Peninsula Daily News, http://seattletimes.nwsource.com/html/localnews/2010582146_carbontimber24.html.