



EWEB's Vision: Payments for Ecosystem Services through a Voluntary Incentives Program

**An Innovative, Incentive-Based Approach for Preserving Water Quality
in the McKenzie River Watershed**



January 2013

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Prepared by

The Institute for Natural Resources

Created by the Oregon Legislature through the 2001 Oregon Sustainability Act, the Institute for Natural Resources' mission is to provide Oregonians with ready access to current, relevant, science-based information, methods, and tools for better understanding natural resource management challenges and developing solutions.

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For

Eugene Water and Electric Board (EWEB)

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Disclaimer

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Executive Summary

EWEB envisions the development of an investment mechanism that makes payments for ecosystem services (PES) as a way to maintain and improve water quality within the McKenzie River Watershed, Eugene's sole source of drinking water. The public name for this concept is the Voluntary Incentives Program. Under the envisioned Voluntary Incentives Program (VIP), EWEB will provide annual dividend payments to landowners for the valuable services their properties provide including water filtration and purification. These dividends recognize the value of the natural capital provided by these lands and their downstream benefits to the residents of Eugene. A fund with sustainable financing will be established to support the dividend payments and the infrastructure necessary to operate the Voluntary Incentives Program. Financing will come from a variety of sources but could be initially endowed through existing water funds (under existing rate structure) or another utility funding mechanism. Additional possible financing sources other than EWEB include corporations, a voter approved bond measure, development impact fees, and state and federal mitigation programs.

EWEB will establish a stewardship boundary identifying riparian forests and floodplains that are eligible to enroll in the VIP. Participation is open to private landowners, local governments, and non-profit organizations that own land within the designated boundary. Based on EWEB's preliminary analysis, an estimated 6,500 acres of riparian and floodplain areas along the McKenzie and major tributaries are eligible to enroll. Land within the stewardship boundary will need to meet a threshold in order to receive payments. This threshold will be determined by adapting existing riparian forest and wetland habitat standards and definitions from NRCS, USFS, Defenders of Wildlife and other entities to establish the criteria for participation in the VIP.

Appropriate infrastructure is essential to implement and run the incentives program: critical tasks include managing the fund, making payments to VIP participants, assessing the quality of land enrolled, negotiating agreements, monitoring properties and verifying compliance, and educating and communicating with the community. The VIP will rely upon a coalition of existing organizations, which will form a watershed investment district (WID), to provide this critical infrastructure, without which successful implementation of the VIP is highly unlikely.

1. Background

1.1 Eugene Water and Electric Board (EWEB)

The Eugene Water and Electric Board (EWEB) is the largest customer-owned utility in Oregon. It was founded in 1911 after a typhoid outbreak was tracked to a private water company that had already been the focus of dissatisfaction regarding its level of service. Citizens subsequently voted to buy the system and establish a publicly owned utility. EWEB currently provides drinking water to over 50,000 customers, electricity to nearly 87,000 consumers and steam to 75 customers in Eugene and nearby areas. Customers comprise residences, businesses, schools and other institutions.¹ It has a five-member Board of Commissioners elected by Eugene residents to staggered four-year terms. EWEB's service area is approximately 235.6 square miles (see Figure 1). In 1927, it shifted from the Willamette to the McKenzie River as its drinking water source. The McKenzie River has long been known for its water quality, and EWEB continues to expand its source protection programs to try and ensure the river's ongoing high quality.

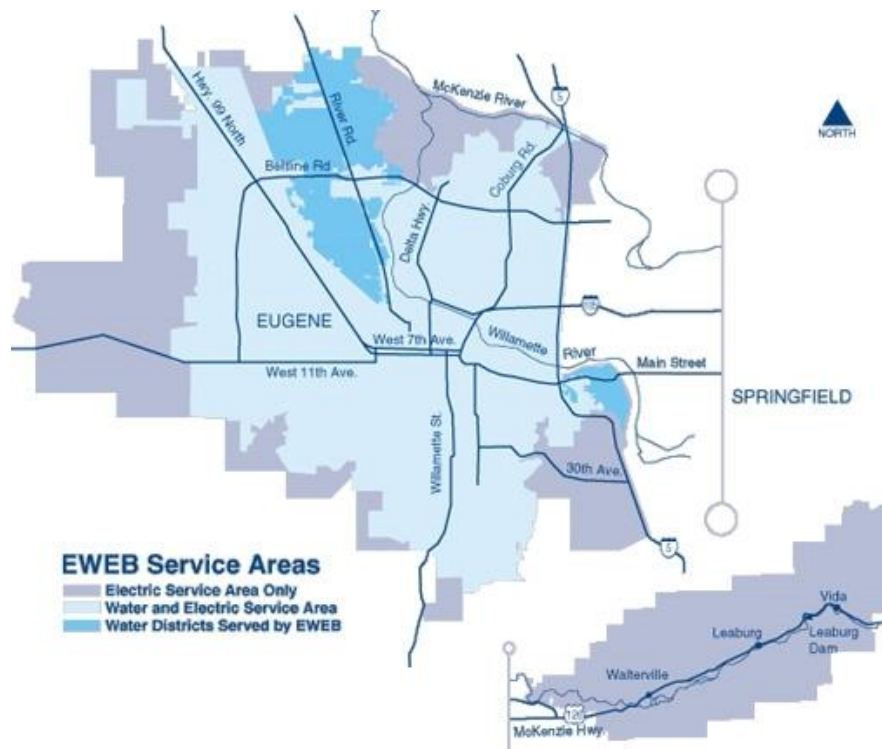


Figure 1.1: EWEB Service Area Map (Source: EWEB Webpage <http://www.eweb.org/map>)

¹ <http://www.eweb.org/who>

1.2 EWEB Source Protection Goals

Since its founding in 1911, EWEB has come to rely on the McKenzie River watershed for power generation from its electric facilities at Carmen-Smith, Leaburg, and Walterville and as a sole source of drinking water for the City of Eugene. EWEB maintains infrastructure in the McKenzie River watershed that consists of dams, canals, lakes, power generation facilities, tunnels, roads, buildings, electric transmission lines, dikes, fences, and transformer substations. EWEB also owns property in the watershed associated with its electric generation facilities as well as islands, riparian areas, and upland properties. In short, the McKenzie River is the lifeblood of EWEB and protection of this watershed is vital to EWEB and the community of Eugene.

In August 2000, the Eugene Water & Electric Board (EWEB) completed a plan to protect the McKenzie River as the sole source of drinking water for the City of Eugene. EWEB began development of a source protection program in May 2001 that implemented the August 2000 plan to address the various threats to water quality and long-term viability of the McKenzie River as a drinking water source. EWEB is currently working closely and developing long-term partnerships with over 40 agencies and watershed stakeholders.

The overall concept of source protection is to have the ability to measure the balance between watershed health and human use over time and implement actions that maintain a healthy balance for production of exceptional water quality. This requires not only being aware of all the different human activities going on within the watershed, but also understanding the limits of what the river can handle and still maintain a high level of water quality.

1.3 Threats to Water Quality in the McKenzie

Results from the Oregon Department of Environmental Quality (DEQ) monitoring over a 13-year period indicated consistently excellent water quality as measured by the Oregon Water Quality Index (OWQI). The OWQI analyzes a defined set of water quality variables and produces a score describing general water quality. The water quality variables included in the OWQI are temperature, dissolved oxygen, biological oxygen demand, pH, total solids, ammonia, nitrate, total phosphorus, and fecal coliform/E. coli (Oregon DEQ 2001; Oregon DEQ 2003). OWQI scores range from 10 (worst case) to 100 (ideal water quality). In general, results indicate that water quality in the McKenzie is good to excellent and the quality tends to decrease as one moves down river. Six of the seven monitoring sites in the McKenzie had an average OWQI score that ranged from 93 to 96 (indicating some of the highest water quality in the state).

Given the excellent water quality in the McKenzie River, EWEB's monitoring program focused on assessing potential threats to maintaining this level of quality over the long term. EWEB has conducted a number of water quality investigations and monitoring efforts with the U.S. Geological Survey (USGS) and other partners, which focused on water quality contaminants that existing raw water treatment processes are not effective in removing (e.g., pesticides, pharmaceuticals, dissolved organic chemicals). In general, runoff from urban or developed areas contained higher levels of contaminants than other land uses.

In addition, EWEB works with a number of watershed stakeholders to conduct baseline water quality monitoring on a regular bases at 14 sites located throughout the watershed. The purpose of this monitoring is to assess long-term trends in water quality associated with metals, nutrients, bacteria and other general parameters. The EWEB baseline report of water quality data between 2000 and 2009 documented a trend of decreasing water quality in the McKenzie River (EWEB 2011). For example, Figure 2 shows the gradual decrease in water quality as sampled at Hendricks Park from 2002 to 2010. EWEB water quality specialists hypothesized that water quality impacts were potentially due to increased development and agricultural runoff in the lower portion of the watershed.

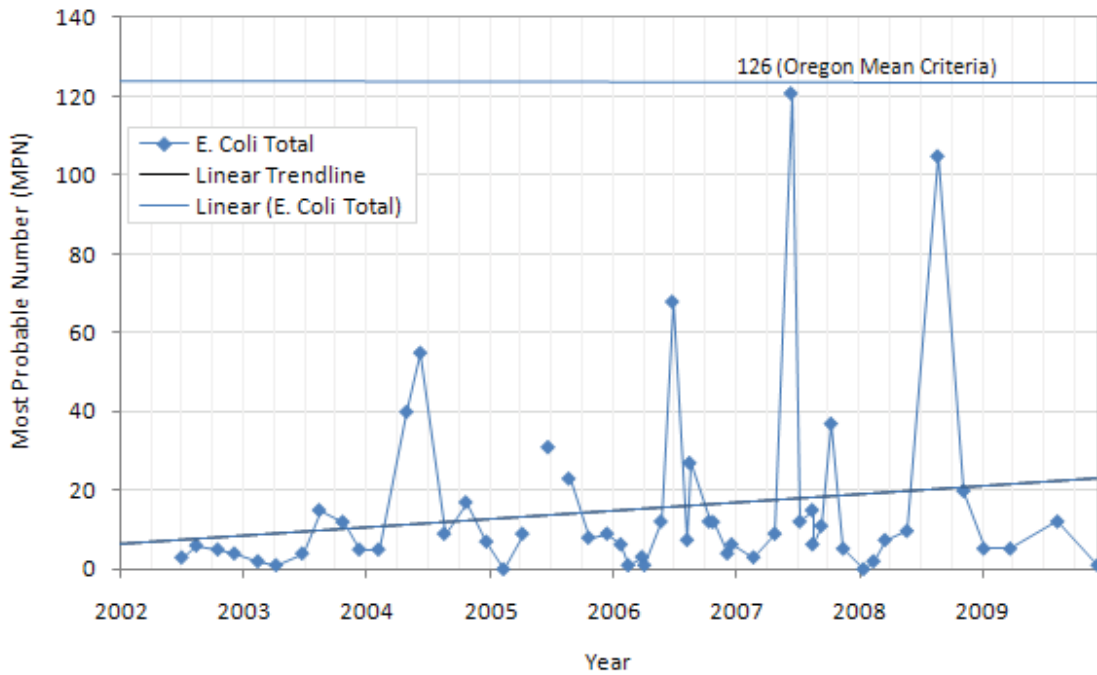


Figure 1.2: *E. coli* trends in McKenzie River at Hendricks Park from 2002 to 2010 (Source: EWEB 2011)

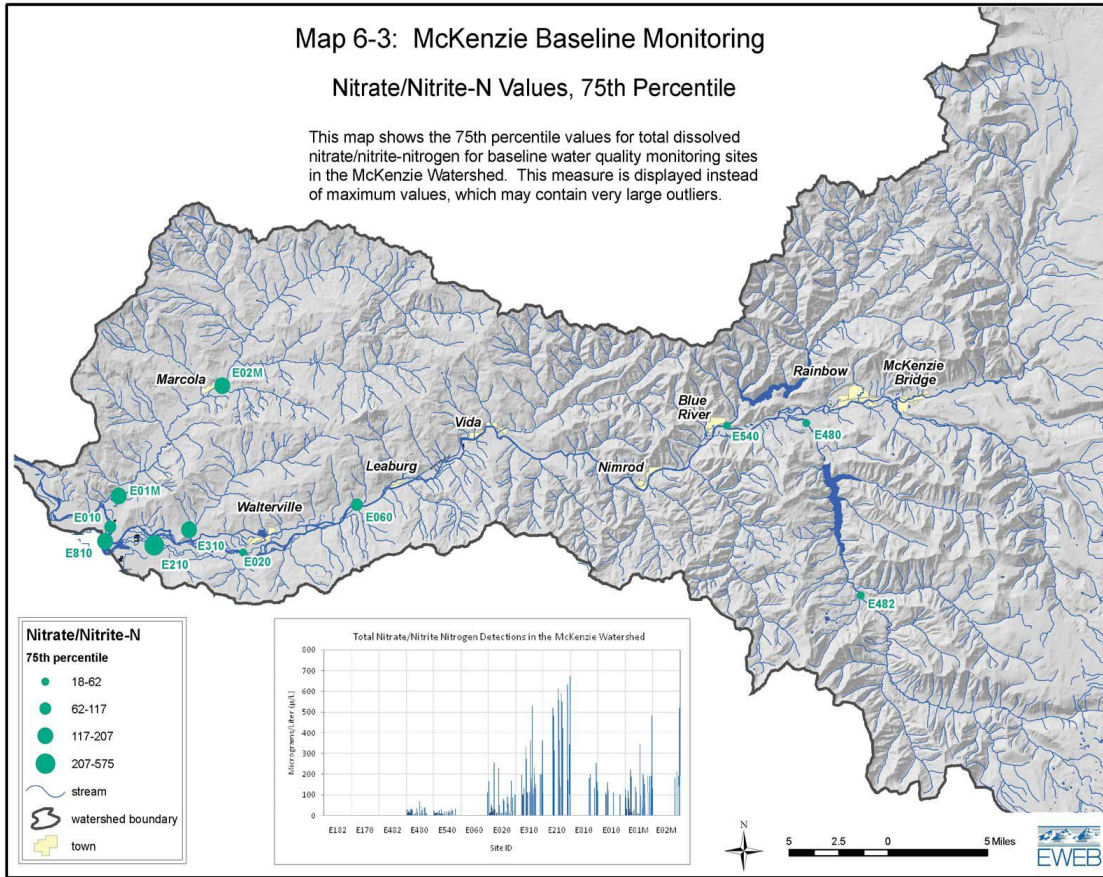


Figure 1.3: Map showing baseline monitoring locations and results for dissolved nitrate/nitrite values (source EWEB 2011)

1.4 Land-Use and Development Trends in the McKenzie

In 2009 EWEB contracted with the Community Planning Workshop at the University of Oregon to conduct an extensive analysis of the land-use and development trends in the McKenzie River Watershed (a link to this report is included in Appendix D). The analysis concluded that there has been a continuing trend of residential development along the McKenzie River. This development has potential negative impacts on water quality due to increased areas of impervious surface, the removal of riparian vegetation, and the flooding or leaking of septic systems, among other concerns. Although Lane County implemented a 50-foot riparian setback requirement in 1992, the Community Planning Workshop report documented multiple examples of the issuance of conditional use permits to allow development within 50 feet of the river (CPW 2009). Additionally, development along the river is typically not contained to just structures, but also includes clearing of native vegetation to enhance river views and establish lawns that reach to the river’s edge. Although individual actions often do not have serious impacts to the watershed, the collective actions of hundreds of landowners can have detrimental consequences to downstream water quality.

Concern over increasing development along the river and the resulting impacts to water quality led county officials to try to implement a new riparian setback ordinance of 200 feet. The way this option was pursued, however, led to a backlash from landowners living upstream who felt their rights were being infringed upon and were not given an opportunity to share their concerns. The resistance to new regulations from local residents led the county to drop the ordinance (Cooper 2010). With the failure of the county to implement regulations that would protect water quality in the McKenzie, EWEB decided to pursue a different option. Instead, EWEB decided that a voluntary, incentive based approach might be more effective at delivering the necessary results. A voluntary, incentive based approach would reward landowners for good stewardship of their land and for the adoption of management practices that benefit water quality, fish and wildlife habitat, and reduce flood and erosion impacts. In the current political and economic climate, this approach appears to be more feasible and socially acceptable.

1.5 Importance of Riparian Forests and Vegetation for Water Quality

EWEB has decided to focus on incentivizing the maintenance and restoration of riparian forests and vegetation through the Voluntary Incentives Program (VIP) because of their demonstrated importance to watershed protection and water quality. These areas, also known as riparian buffers, consist of trees, shrubs, grasses, and forbs that grow directly along the river's edge and provide multiple environmental benefits (see figure 1.4). Most directly related to water quality, riparian buffers filter sediment, fertilizers, pesticides, organic matter, and other pollutants and

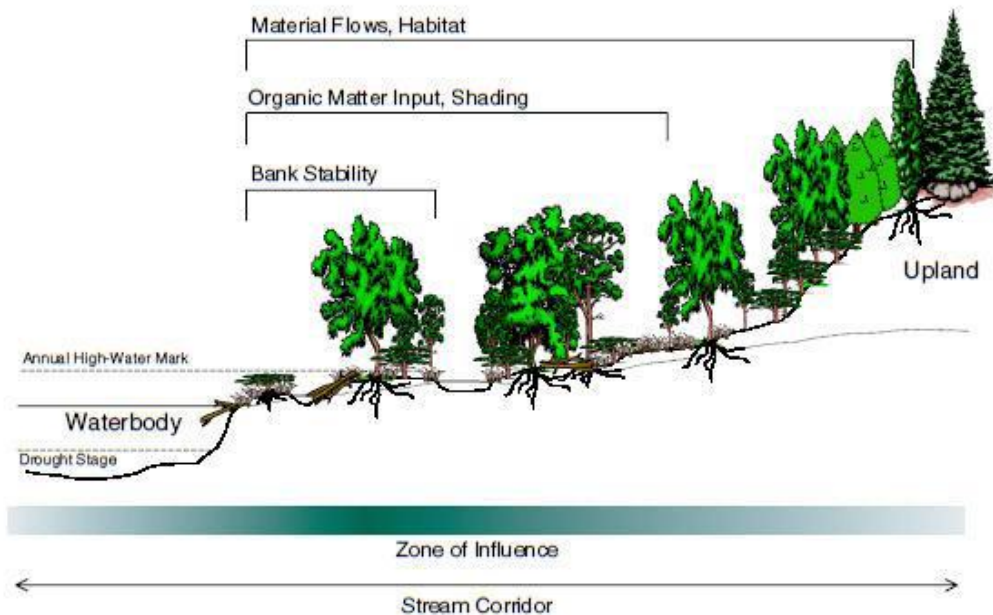


Figure 1.4: Diagram of generalized riparian area (Source: NRC 2002)

keep these elements from entering rivers. Avoided pollution upstream means less treatment required downstream often with substantial financial savings to utility customers (see Ernst 2004 and Postel and and Thompson, Jr 2005). For example, increased suspended sediment in the river is directly related to increased chemical costs in the raw water treatment process to remove suspended sediment. Maintaining healthy riparian forest buffers plays a key role in reducing erosion and overland transport of sediment leading to **avoided treatment costs** over time.

Riparian buffers also provide important habitat for numerous wildlife species. Furthermore, riparian forests shade rivers, resulting in lower water temperatures, which are important for many aquatic species including salmon and trout. The numerous benefits provided by riparian buffers make these investments a logical initial focus for the VIP and will allow partners to address multiple objectives at the same time.

The numerous benefits that riparian buffers provide also represent an economic value to society. To determine this value, EWEB hired Earth Economics to conduct a study of the value of natural services in the McKenzie River watershed. This valuation study determined that riparian buffers represent a value range of \$1,031 to \$6,713 per acre per year (Table 1.1). The significant economic value of riparian buffers in the McKenzie, as well as the other benefits described above, makes these are logical areas to target through the VIP.

Table 1.1: Value of riparian buffers in the McKenzie watershed (Source: Earth Economics 2012)

Ecosystem Service	Riparian Buffer	
	Low Value (\$/acre/year)	High Value (\$/acre/year)
Aesthetic & Recreational	76.90	1169.41
Biological Control		
Disturbance Regulation	43.31	3884.40
Food Provisioning		
Gas & Climate Regulation	381.28	381.28
Genetic Resources		
Habitat Refugium & Nursery	0.41	59.96
Nutrient Cycling		
Pollination	413.50	413.50
Raw Materials		
Science and Education		
Soil Erosion Control	0.10	84.33
Soil Formation		
Waste Treatment	47.96	455.93
Water Regulation		
Water Supply	67.30	267.81
TOTAL	1030.66	6716.62

2. Voluntary Incentives Program Goals and Overview

2.1 Voluntary Incentives Program Goals

EWEB seeks to implement a payment for ecosystem services marketplace or Voluntary Incentives Program (VIP) that protects the McKenzie River Watershed as a healthy source for drinking water for the residents of the City of Eugene. The VIP will achieve this by **compensating landowners along the McKenzie River with annual dividend payments for management practices that benefit water quality and the overall sustainability of the watershed**. Funding for the payments could come from a variety sources and is discussed in more detail in Section 3.1. Along with compensating existing good land stewards, these market incentives will also entice more landowners to restore the condition of their land so they can participate in the program. This will improve the ecological health of the watershed and result in improved water quality over time. The VIP will initially focus on **protecting riparian and floodplain areas** – the most critical parts of the McKenzie River Watershed. This focus could expand to other watershed priorities as the program expands and new needs emerge.

EWEB's approach will **reward good land stewards** that maintain high quality riparian habitat to ensure that these landowners continue these practices. This differs from other programs, such as NRCS's Environmental Quality Incentives Program (EQIP), which offer incentives to landowners with degraded land to restore their properties to an improved condition. Instead, EWEB has chosen to reward landowners already implementing outstanding management practices and to provide a high standard for other landowners to strive for. Landowners that do not currently qualify to enter the marketplace can use existing restoration programs, such as EQIP, to improve their properties to the point where they can participate in EWEB's Voluntary Incentives Program.

An additional goal of the program is to **maintain transparency**. EWEB will provide clear standards to qualify for participation and outline a simple process that landowners can follow to enter the VIP. It is also important to provide transparency to rate payers and the general public so that they know how their money is being spent and what they are getting in return. EWEB will provide information on the payment for ecosystem services marketplace through an easily accessed online "dashboard". We elaborate on the dashboard concept in section 3.5.

Maintaining effective communication is also a goal of the marketplace and key to its successful implementation. One focus of the communication strategy is illustrating to urban water users the role rural landowners have in maintaining water quality and increasing the public's awareness about where their water comes from. Public education programs will be employed in order to communicate that the protection of the landscape by rural landowners is crucial to water quality in the McKenzie River. Emphasizing the importance of riparian buffers and their role in reducing downriver water treatment costs will also improve water users' acceptance of rate payer funds that could be used to fund the marketplace. A number of actions are underway to start building this understanding:

- a) EWEB hired Earth Economics (www.eartheconomics.org) to conduct a watershed valuation that derives dollar values for natural processes or ecosystem services that benefit society using a benefit transfer methodology. This methodology is an acceptable approach to the valuation of natural assets according to the Government Accounting Office (GAO). The valuation provides a range of values, in dollar terms, that each acre of healthy riparian forest in the McKenzie watershed provides to society. The economic benefits that riparian areas provide are not currently valued. The Executive Summary of Earth Economics' valuation of the McKenzie watershed is provided in Appendix A.
- b) EWEB has collected daily data on treatment costs and turbidity since 2004. Preliminary review of this data shows a strong correlation between increased turbidity and increased treatment costs. Researchers at Oregon State University are planning to work with EWEB to analyze these data and articulate this relationship and the broader implication the data may have for other utilities in understanding and quantifying avoided costs.
- c) University of Oregon and Oregon State University are conducting a series of surveys with EWEB customers and landowners to gauge their understanding and acceptance of valuing natural processes and using rate payer funds to reward rural landowners for management practices that benefit downstream water quality. In a survey of 399 EWEB customers, respondents were very supportive of these efforts with 71% definitely or probably willing to pay at least \$0.50 per month to protect water quality in the McKenzie watershed while only 17% were definitely or probably unwilling to pay the same amount. Other preliminary survey results are provided in Appendix B.

A component of the communication strategy will be showcasing good land stewards in TV spots, direct mailings, and newsletters. The Institute for Natural Resources' Oregon Explorer website has developed early example of this approach that could be expanded to include participating VIP landowners². This recognition will provide an additional incentive for participating landowners and send the message that downstream water users value their actions. Such communication will help bridge the urban-rural divide and demonstrate how cooperation through the marketplace is beneficial to all participants.

2.2 Brief Voluntary Incentives Program Overview

Initial funding for the VIP is expected to come from EWEB water users through a rate payer fund that is expected to generate \$200,000-\$250,000 annually. Additional funding sources will be added to complement this initial contribution (please see section 3.1 below for more information about additional sources envisioned to contribute to the fund). Cascade Pacific Resource Conservation and Development will manage the funds and make payments to participating landowners and to cover the costs associated with administering the VIP.

EWEB will establish specific criteria for participation and provide information to landowners on how to begin the process. EWEB will arrange for interested landowners to meet with program

² <http://oe.oregonexplorer.info/ExternalContent/VIPRiparianStewardship/index.html>

partners, such as the Upper Willamette Soil and Water Conservation District and McKenzie Watershed Council, who will assess the quality of the riparian forest and wetland areas on the property. If the property does not qualify, these representatives can provide resources to the landowner on how to restore the condition of their property so that they can participate at a later date. If the property does qualify to participate, the VIP partner will outline the enrolment options available. These options are primarily related to the length of the agreement that the landowner can enter into, which may include 10, 15, or 20-year options as well as perpetual conservation easements.

Landowners wishing to proceed will be put in contact with a VIP partner that is able to negotiate and hold agreements, such as the McKenzie River Trust or Upper Willamette SWCD. Enrolled lands will then be monitored on a regular basis for compliance with the agreements. Remote sensing will be used to verify compliance and property visits will be conducted for those tax lots that are flagged for ground truthing based on the remote sensing analyses. Participating landowners in compliance with their agreements will receive annual dividend payments from the fund to compensate them for the ecosystem services their properties provide. We provide more detail on the marketplace infrastructure and the specific roles envisioned for VIP partners in section 3.4.

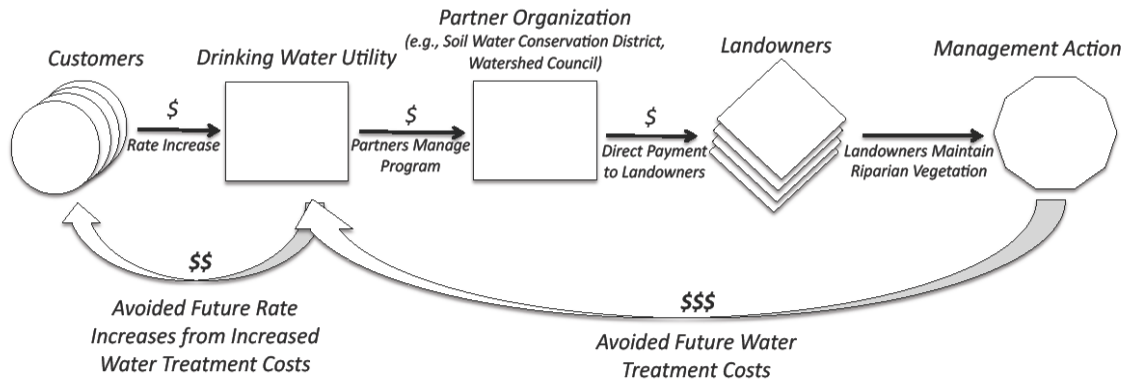


Figure 2.1: General diagram illustrating how a water quality incentive program could work

3. Voluntary Incentives Program Components

3.1 Endowing the Fund

EWEB envisions establishing a fund with sustainable financing over time to support annual payments to landowners participating in the marketplace and to support the infrastructure necessary to operate the market. Financing will come from a variety of sources including:

Rate Payer Funding: A number of options are being evaluated including using existing rate payer funds, increasing water user fees thru a water rate increase, establishing a watershed stewardship fee that does not distinguish between electric and water customers (especially since EWEB has four hydroelectric projects in the McKenzie Watershed), or a combination of the above options. The EWEB Board of Commissioners will need to approve the final funding

recommendations, which is anticipated to happen in 2013 (timing will in part depend on economic recovery). The rate payer funding action will generate an estimated \$200,000 to \$250,000 annually for the fund.

Bond or Ballot Measure: EWEB is also looking at the potential to generate funds for source water protection through a bond or ballot measure. This potential funding source would need to be approved by voters but has the potential to generate significant revenue. EWEB is exploring this potential with the Trust for Public Land (TPL). TPL offers technical assistance in examining feasibility, gauging voter support, and designing a specific measure.

Corporate Sponsorship: Additional funding could also come from corporate sponsorships. The following are some additional possibilities to engage local businesses in supporting the marketplace.

- a) EWEB has discussed the possibility of partnering with Eugene based craft breweries to create a line of products marketed as “sustainable beers” in which a percentage of revenue is contributed to the fund, which is used to protect the excellent water quality they rely on producing quality beer. In return, the breweries enhance their image with customers and position themselves as socially and environmentally responsible corporate citizens.
- b) There is also the possibility for developing an annual certificate or decal that businesses can purchase and display indicating they are supporting activities that protect and enhance the McKenzie River watershed.
- c) Businesses involved in tourism (e.g., hotels, bed & breakfasts, restaurants, river guides, fly fishing operations, rafting, RV camping, etc.) could impose a small fee or tax that is contributed to the fund. The McKenzie Watershed has a significant recreational pull and tourism related industries could help protect the resources that in part sustain their business models.
- d) Large water users associated with educational organizations (e.g., University of Oregon, Lane Community College, and local school districts) could provide the option for parents of students to voluntarily contribute small amounts toward watershed protection. EWEB is involved in current projects to build a strong connection between education and research programs and watershed and water resource protection and management. This is a way of investing in helping future generations to learn and think about water resource management and protection in the face of climate change and other challenges. In addition, EWEB is looking at engaging athletic departments to either provide McKenzie water in reusable bottles at a cost that raises proceeds for watershed protection or return some of the proceeds from bottled water sales at athletic events for watershed protection.
- e) Large water rights holders (e.g., IP, Weyco) use large quantities of river water for industrial and agricultural processes without having to pay for the actual water withdrawn. By voluntarily accepting a small fee placed on products produced using McKenzie water, it will generate funds for watershed protection and make this business connection to consumers.
- f) Large chemical use and storage facilities could voluntarily accept a small fee placed on products produced for watershed protection as a way to offset the threat posed by the

presence of large quantities of chemicals and demonstrate social and environmental responsibility in the area that they operate in.

Development Mitigation Fees: EWEB had some initial discussions with the Lane County government after the failure of the drinking water protection overlay ordinance to explore the possibility of enacting a development mitigation fee. Landowners wishing to develop their properties in a manner that negatively impacts the watershed would be required to pay a fee that would be contributed to the fund. Since the goal of the fund is to maintain and improve water quality and riparian habitat, the proceeds generated by the fee would be invested in a manner that would offset the development impact. This objective could be met through the VIP. In addition, a longer-term solution may include other mitigation fees associated with permittees, such as highway or other infrastructure projects with significant environmental impacts, to ensure mitigation funds are targeted to high priority restoration and protection projects in the watershed where they occur.

Upper Willamette Soil and Water Conservation District Tax Base: Oregon Soil and Water Conservation Districts (SWCDs) have statutory authority to levy taxes with approval of local voters. As of January 2008, 10 SWCDs have received local voter approval to assess local property taxes in the form of permanent tax rates, not including Lane County. Upper Willamette SWCD could pursue enacting a tax to invest in conservation activities. Some of the funds generated from the tax could be invested through the VIP.

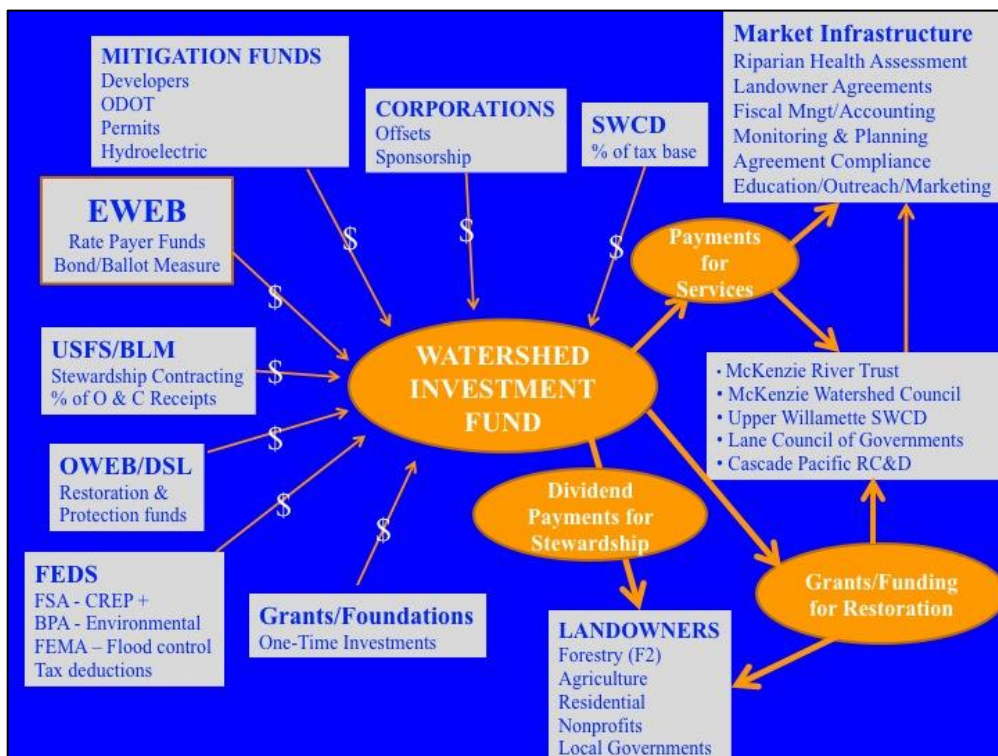


Figure 3.1: Potential sources of financing the marketplace fund and watershed investment district partners. Other potential sources exist but have not been explored

3.2 Voluntary Incentives Program Focus, Eligibility, and Payment Structure

EWEB's Voluntary Incentives Program focuses on riparian forests and floodplains along the McKenzie River. EWEB will establish a VIP boundary identifying riparian forests and floodplains that are eligible to enroll. Participation is open to private landowners, local governments, and non-profit organizations that own land within the designated boundary. Based on EWEB's preliminary analysis, an estimated 6,500 acres of riparian and floodplain areas along the McKenzie and major tributaries are eligible to enroll in the proposed program. The initial VIP boundary was drawn using aerial photography, light detection and ranging technology (LiDAR imagery of bare earth and mapped structural footprints), and zoning layers to focus on areas not impacted by development and/or infrastructure (e.g., roads), inclusive of floodplain, upper terraces, old meander scars, and other geomorphic features, and included all zoning except F-1 industrial forest land (and federal ownership) (Figure 3.2).



Figure 3.2: An example of the riparian VIP boundary (orange shaded area). Land within this area is potentially eligible to participate in the marketplace.

Land within the market boundary that a landowner wishes to enter into the marketplace will need to meet a threshold in order to receive payments. EWEB will adapt existing riparian forest and wetland habitat standards and definitions from NRCS, USFS, Willamette Partnership,

Defenders of Wildlife and other entities to establish criteria for participation in VIP. The criteria will be adapted into a form that will allow landowners to easily assess if their riparian forest may be eligible (e.g., use of photographs and descriptive diagrams). Landowners that meet the threshold of having 65-70% or more of their riparian forest as healthy would be eligible to enter the marketplace. The goal is to keep eligibility as simple as possible for landowners and partners to understand and implement. EWEB and Lane Council of Governments (LCOG) conducted a preliminary LiDAR analysis of the initial VIP boundary to estimate the number of acres with existing vegetation patterns that may indicate presence of healthy riparian forest (see Table below). Based on this preliminary analysis, approximately 44% or 2,800 acres within the VIP focus area or boundary would be potentially eligible to enter the program and receive annual payments for long-term protection of healthy riparian forest.

Table 3.1: Preliminary analysis of riparian cover on properties within VIP boundary. Properties with 67-100 percent cover (red box) are potentially eligible to enter program.

Percent Cover	Acres	Percent of Total Area
0-33%	1,664	25.7%
34-66%	1,927	29.8%
67-100%	2,872	44.4%
Total Acres	6,463	

EWEB estimates 20-30% of generated funds are necessary to support VIP infrastructure. It is assumed that a larger short-term investment of funds will be needed to build the tools and capacity that partner organizations will need to operate the various components of the necessary infrastructure. The remaining 70-80% of funding will be used to make direct payments to landowners participating in the VIP. The idea is that these payments represent a form of dividends from the capital these natural processes provide to downstream water users and society.

A simplified calculation for estimating the per-acre dividend payments is the total funding available (minus funds for infrastructure) divided by the total number of acres in the VIP boundary. The actual per acre dividend payment will vary based on the type and length of the landowner agreement. Dividend payments to landowners will also vary from year to year as watershed investment funds grow or change based on amount of payouts and roll-over of remaining funds to the next year (Table 3.2).

Calculation of Dividend Payments

$$\text{Per acre annual dividend} = \frac{(\text{Total Funds} - \text{Infrastructure Costs})}{\text{Total Acres in VIP Boundary}}$$

Table 3.2: A conceptual example of how the dividend payments would work over time

Year	Dividend Calculation ¹	Acres Enrolled ²	Total VIP Payout ³
1	\$250,000/6,463 acres = \$38.68/acre	300	\$11,604
2	\$488,396/6,463 acres = \$75.56/acre	600	\$45,341
3	\$693,055/6,463 acres = \$107.23	1,000	\$107,230
4	\$835,825/6,464 acres = \$129.32/acre	???	???

¹ – Due to sustained rate payer financing each year adds a new \$250,000 investment.

² – Based on initial LiDAR analysis it is estimated that 100% eligible acre enrollment would be approximately 2,800 acres.

³ – Balance of annual investment (\$250,000) minus payout equals the amount of funds rolled over into next year.

One way to manage the dividend payment to landowners over time as additional revenue sources build the VIP fund is to increase the acreage in the market boundary. This way other priority areas for protection and restoration can be included over time as a focus for funding.

Once a landowner thinks his/her parcel would qualify in the program, a consultation would be scheduled with one of the qualified partners (i.e., Upper Willamette SWCD or McKenzie Watershed Council) to conduct a riparian health assessment. The assessment would verify riparian forest conditions, determine the percentage of high quality forest, as well as list other actions necessary to maintain or enhance riparian conditions over time. These management actions could be folded into the long-term agreement based on landowner objectives.

Since participation in the VIP is limited to properties meeting thresholds for high quality riparian forest, it is important that properties below these thresholds have a means to improve their properties and meet the requirements for participation. To achieve this objective, EWEB can leverage existing partner and government programs. For example, the Oregon Watershed Enhancement Board (OWEB) and NRCS offer programs that incentivize restoration. OWEB

currently offers its Small Grant Program for private landowners that awards up to \$10,000 for restoration projects that improve water quantity, water quality, and fish and wildlife habitat. NRCS also offers several programs including the Conservation Reserve Enhancement Program (CREP), Environmental Quality Incentive Program (EQIP), Habitat Incentive Program (WHIP), Conservation Security Program (CSP), and Wetland Reserve Program (WRP). In addition, other existing ecosystem service markets in Oregon pay landowners for restoration of degraded land to achieve temperature credits from added shade to offset regulatory limits on thermal discharges into streams and rivers. By using these programs and markets to incentivize restoration, more properties can eventually enter the VIP over time. The program will then provide incentives to maintain properties in an improved condition.

3.3 Voluntary Incentives Program Infrastructure and Partners

Appropriate infrastructure is essential to implement and run the VIP. Infrastructure is necessary to manage the fund, make dividend payments to VIP participants, assess the quality of land enrolled, negotiate agreements, monitor properties and verify compliance, and educate and communicate with the community. The VIP will rely upon a coalition of existing organizations, which will form a watershed investment district (WID), to provide this infrastructure. The hope is that this regular source of funding for existing organizations whose missions align with the VIP's activities will be able to increase capacity and engage landowners beyond what is required for the VIP infrastructure. Key components of the WID and the partners envisioned to supply the infrastructure are described below:

Fund Management and Making Dividend Payments to Market Participants: EWEB envisions Cascade Pacific Resource Conservation & Development Council (RC&D) as the fiscal agent responsible for managing the fund, making payments to VIP participating landowners, and funding organizations carrying out work on behalf of the VIP. Cascade Pacific RC&D has specific capacity to provide fiscal management services. This is also a strategic decision since Cascade Pacific RC&D works in six counties in the Willamette Valley. Should other water utilities in the area wish to replicate EWEB's program, a key component of the market infrastructure will already be in place and will facilitate the establishment of new programs or marketplaces in the Willamette Basin.

Riparian Forest and Floodplain Vegetation Assessments: The quality of the riparian forests will need to be evaluated to determine if the land qualifies to participate in the VIP. EWEB will rely upon existing natural resource councils and districts (e.g. McKenzie Watershed Council and Upper Willamette SWCD) with experience and capacity to provide these assessments. Should a property not qualify to enter the VIP, these organizations are also well positioned to provide resources to landowners to help them restore riparian conditions on their property.

Negotiating and Holding Agreements: Several market partners including the McKenzie River Trust and the Upper Willamette SWCD are well established to negotiate agreements with landowners to enter the VIP. The McKenzie River Trust specializes in perpetual conservation

easements and is the logical organization to negotiate and hold this type of agreement. Depending on its organizational priorities, the McKenzie River Trust may not be the best organization to hold termed agreements. In this case, the Upper Willamette SWCD would negotiate and hold the termed agreements.

Monitoring Properties and Verifying Compliance: Once properties are enrolled in the VIP, they will need to be monitored to verify compliance with the terms of the agreement. This verification is essential in maintaining the integrity of the program. One approach to verifying compliance is using remotely sensed imagery to assess conditions on a regular basis (i.e., every 3-5 years) and has the benefit of being more efficient than visiting each property annually.

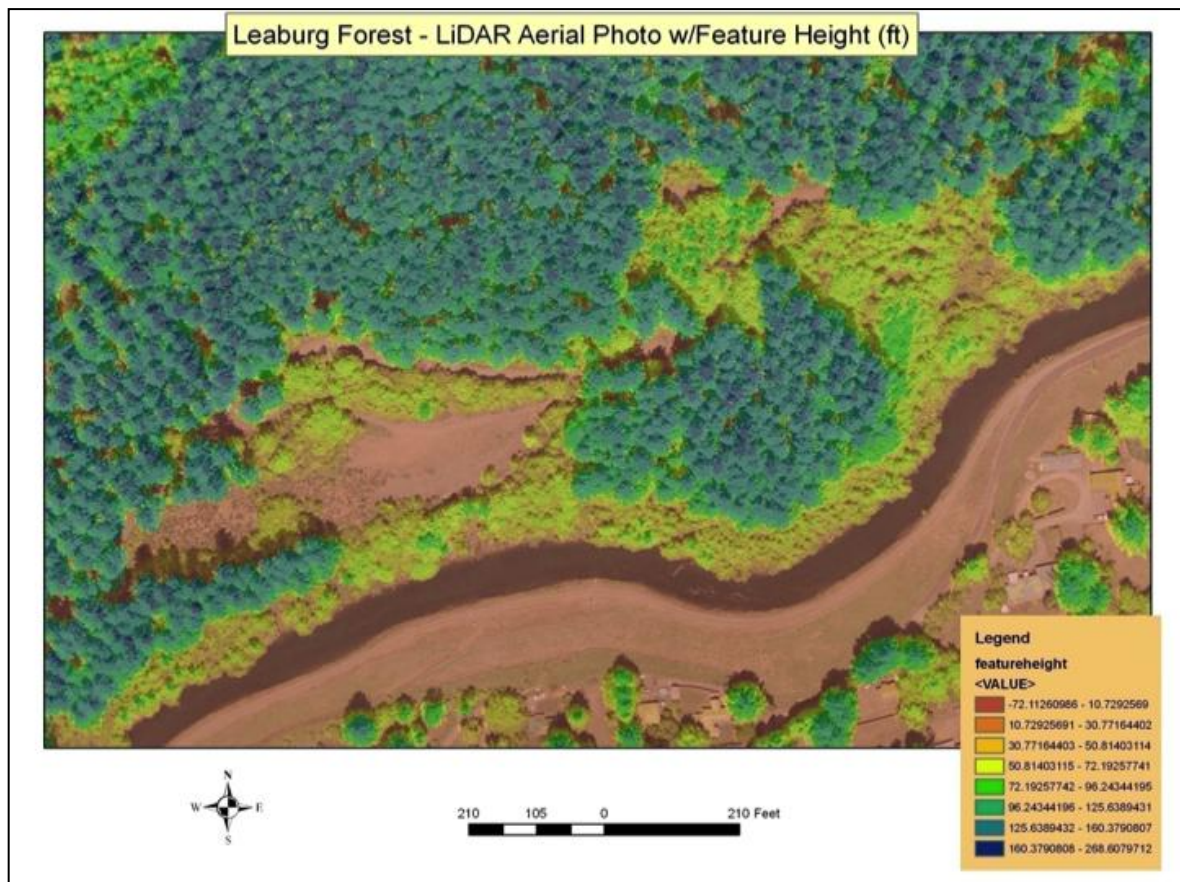


Figure 3.3: An example of a LiDAR image showing riparian forests and vegetation in the Leaburg Forest. LiDAR images could be used for monitoring and verifying compliance of properties enrolled in the VIP.

The use of light detection and ranging (LiDAR) technology is currently being assessed as an efficient tool for understanding the amount and degree of vegetation changes on a parcel-by-parcel basis over time (especially when combined with aerial photography) (see Figure 3.3). LiDAR allows the use of algorithms to compare vegetation density and height changes over time

with resolution of individual trees and shrubs. The Lane Council of Governments (LCOG) has specific capacity to carry out remote sensing analyses and could be a program partner in this role. While these approaches are not as rigorous as programs that use extensive field measurements to track specific changes in ecosystem functions on a parcel-to-parcel basis, many payment programs utilize management practices as proxies for ecosystem improvements. Such approaches have the advantage of being less costly and less complicated than more sophisticated forms of measurement.

Market Planning: EWEB is tasked with planning the VIP and coordinating program activities with partners. Program planning includes using information from existing conservation and protection plans and watershed valuation studies (e.g., the valuation study conducted by Earth Economics) to ensure the VIP boundary includes high priority areas for protection. The VIP boundary should include areas of the watershed that provide the highest value for maintaining exceptional water quality. Over time, the fund that pays eligible landowners enrolled in the VIP will grow since unspent funds for acreage in the market boundary not eligible or not enrolled will carry-over to the next year when new funds are added. Program planning will require periodic adjustment of the market boundary to include new areas of importance for protection in order to maintain reasonable dividend payout amounts to landowners on a per acre basis (i.e., prevent inflated payments that exceed value of services provided to downstream water users).

Other planning activities include coordination with future restoration and carbon markets currently under development, leveraging other potential funding sources, establishing grant programs, coordinating with protection and/or restoration projects on public lands (e.g., USFS, BLM) and applying lessons learned into new program structures, monitoring and rules.

Education, Outreach, and Marketing: All the partners have roles to play in educating their diverse constituencies about the VIP. In particular, EWEB is responsible for educating rate payers about the importance of the program for maintaining water quality and developing support for using rate payer funds. In addition, EWEB is responsible for keeping rate payers informed about the status and activities of the program (see section 3.4 below for more information). Upper Willamette SWCD, McKenzie River Trust, Cascade Pacific RC&D, and the McKenzie Watershed Council are all well-established organizations and maintain strong relationships with landowners in the area.

In addition, Cascade Pacific RC&D operates the Berggren Demonstration Farm on property owned by the McKenzie River Trust with funding and management direction from EWEB. One goal of the farm is to demonstrate agricultural practices in the floodplain that benefit water quality and increase economic health of McKenzie farms (a demonstration of EWEB's Healthy Farms Clean Water Program). This will include showcasing how the 50 acres of floodplain forest can be enrolled in the VIP and receive annual payments that provide additional income sources for farmers from lands that are currently not farmed anyway (see Figure 3.4 for an aerial image of the farm).

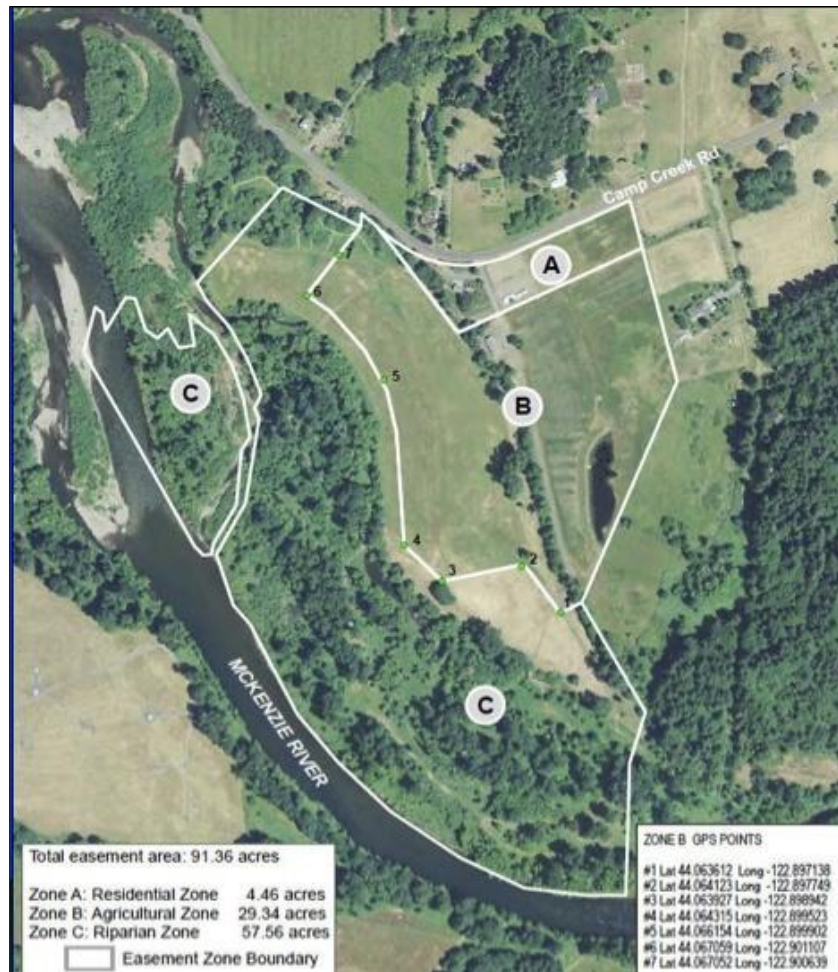


Figure 3.4: An aerial image of the Berggren Demonstration Farm. The farm will be used as an outreach and educational resource in the VIP.

EWEB will work with these partners to develop outreach strategies to educate landowners within the VIP boundary of the opportunities available to them. This will include using email lists, mailing lists, newsletter announcements, newspaper articles, and workshops at the Berggren Demonstration farm to disseminate information. As the VIP is being built and concepts explored, EWEB and partners are currently holding monthly meetings to think through each component of the program and bring to the table existing solutions or research that can inform the group and leverage existing information and programs. EWEB also conducts monthly upriver meetings to give landowners an opportunity to provide feedback on how the VIP is established.

3.4 Market Reporting and Transparency

Maintaining transparency is essential to the integrity of the Voluntary Incentives Program and is an obligation owed to the rate payers and other entities funding it. Maintaining up-to-date statistics about program activities, water quality trends, and other information is critical for maintaining transparency. One approach to establishing this transparency is using an online “dashboard” to provide information on all aspects of the VIP to the general public. The dashboard concept is discussed below:

Online Dashboard: EWEB envisions establishing a “dashboard” that is accessed via the web. The dashboard will provide a centralized location for reporting information related to the VIP. This will include an analysis of environmental trends including data on water quality and development impacts (e.g., number of building permits issued) as well as data on activities related to the VIP itself (e.g., number of acres protected or under agreement, amount of money invested in projects and spent on program infrastructure, etc). The main objective of the dashboard concept is to provide transparency in a simple, easy to understand format that is accessible to all stakeholders, including those without a technical background in water quality or land management. EWEB is exploring the possibility of funding the development of the dashboard through a grant.

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Appendix A: Executive Summary from Earth Economics “Nature’s Value in the McKenzie Watershed” Study

Nature’s Value in the McKenzie Watershed
A Rapid Ecosystem Service Valuation

May 2012

The logo for Earth Economics, featuring the words "EARTH" and "ECONOMICS" stacked vertically in a white, sans-serif font. To the right of the text is a graphic element consisting of three horizontal white bars of varying lengths, stacked vertically.

EARTH
ECONOMICS

Authors: Rowan Schmidt and David Batker

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Executive Summary

An essential asset to both economic development and quality of life is “natural capital,” the ecosystems, nutrient cycles, water, geology, climate and topography that provide an abundance of goods and services for all of us. This study contains a rapid assessment of the economic value provided by natural capital in the McKenzie Watershed.

The McKenzie Watershed spans forests, rivers, lakes, wetlands, grasslands, shrub, snowpack and agricultural lands that provide economically valuable goods and services. Goods include fish, timber, drinking water and agricultural products. Services include flood protection, hydroelectric power, drinking water filtration, pollination, local weather and climate stability, natural beauty and recreation.

For this assessment, the McKenzie Watershed was divided into 10 land cover types using Geographical Information Systems data: Agricultural Lands, Pasture, Forest (five age groups), Riparian Buffer, Urban Green Space, Grassland, Shrub/Scrub, Lakes/Rivers, Wetlands and Other. Each natural land cover across the McKenzie Watershed produces a unique suite of up to 23 ecosystem services.

Ecosystem services were identified for nine of the land cover types and a subset of these services were assigned dollar values using benefit transfer methodology. This is an accepted economic methodology that utilizes previous valuation studies of similar goods or services in comparable locations. These valuation studies use one of eight valuation techniques, including market pricing, cost avoidance, travel cost and contingent valuation.

The ecosystem services examined include climate stability, flood protection, water filtration and supply, wildlife habitat, pollination, soil erosion control, soil formation, biological control, nutrient cycling, aesthetic and recreational value. Results show that

by providing a range of benefits, **McKenzie Watershed ecosystems provide between \$248 million and \$2.4 billion in benefits to the regional economy each year.**

This large range in values represents an appraisal of the McKenzie Watershed’s natural capital, similar to a house or business appraisal. This appraisal replaces the default value zero for the economic value of ecosystems in the McKenzie Watershed. The range is wide, but will narrow with more detailed analysis of key ecosystem services and land cover types, and as spatial mapping of the watershed’s ecosystem services is completed.

At present, the low end of the range can be considered a baseline value and an underestimate, of the true value because while up to twenty known valuable ecosystem services for each land cover were identified, only between 5 and 19 were actually valued for each land cover type. Some highly valuable ecosystem services were not valued due to a lack of valuation studies. The storage value of ice and snowpack, for example, critically valuable for both water supply and energy generation, is not included. The McKenzie Watershed’s ice and snowpack stores water in the wet winter and releases it in the late spring and early summer, providing value for drinking, agricultural and industrial water, hydroelectric power, flood control, recreation and salmon habitat. This study did not place a dollar value on the water storage value of snow pack.

Treating natural capital similarly to an economic asset that provides a stream of benefits over time, such as bridges, apartment buildings, roads or other built infrastructure provides an estimate of the asset value of natural capital. This is similar to using apartment rental payments (flow of value) to estimate the total value of an apartment building (asset value). Natural systems are different than built capital because whole watersheds are seldom bought or sold. Based on the ecosystem services examined, and

treated like an asset with a lifespan of 100 years, **the asset value of the McKenzie Watershed is between \$6 billion and \$58 billion at a 4% discount rate.** Unlike built capital systems, which seldom have a 100-year lifespan, natural systems are self-maintaining and have far longer productive lifespans. Thus, these estimates are conservative.

Using a 0% discount rate, which recognizes the renewable nature of natural capital and assuming that people 100 years from now will enjoy the same level of benefits (a more likely scenario for natural capital), the McKenzie Watershed has an asset value of between \$25 billion and \$235 billion. The analysis of natural capital value is relatively new, but well accepted and increasingly used by large private companies, federal agencies and policy makers. These figures are based on cutting-edge economic analysis tools that were developed, in part, with a United States National Science Foundation grant.

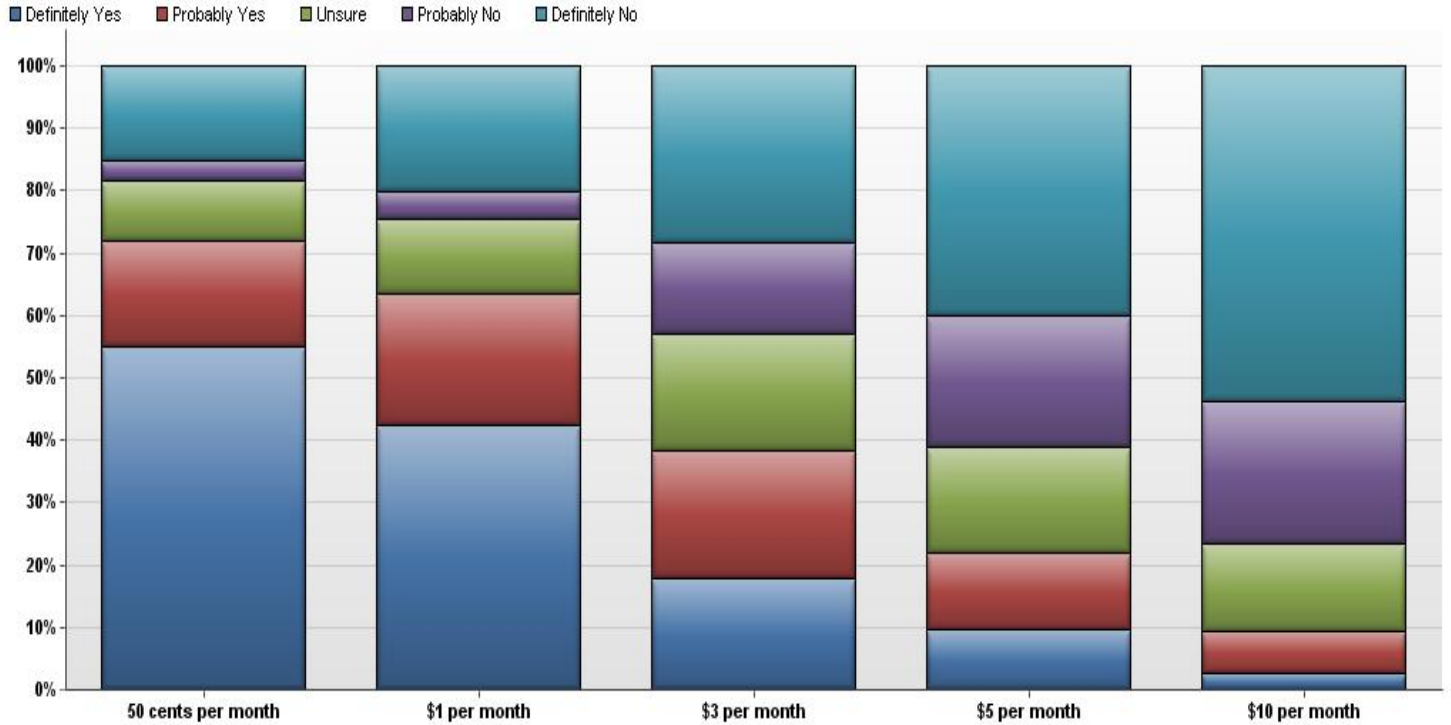
Summary of Recommendations

The following steps are recommended based on the study findings:

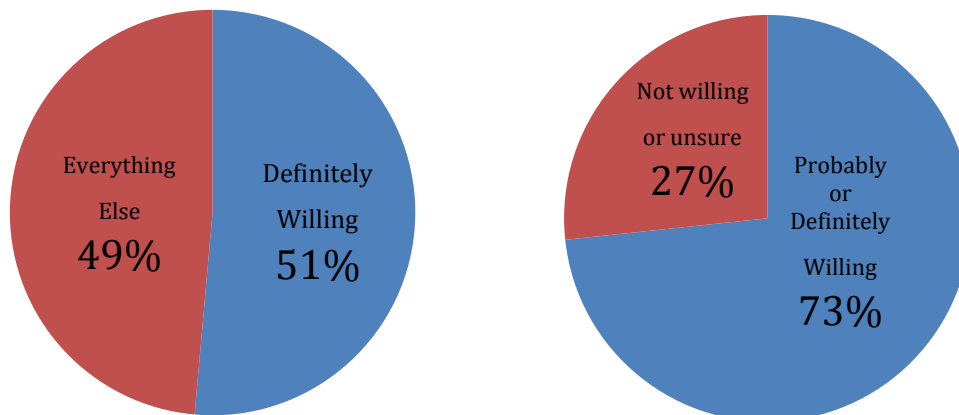
- **Invest in natural capital.** The conservation and the restoration of McKenzie Watershed ecosystems should be included as a key asset and investment opportunity for promoting economic prosperity. This appraisal of value is legally defensible and applicable to decision-making at every jurisdictional level.
- **Conduct detailed valuation, mapping and modeling of key ecosystem services.** This study provides a baseline valuation of ecosystem services in the McKenzie Watershed and identifies key local benefits provided. More detailed valuation studies on these benefits can be used to make more cost-effective investments across the landscape. Value can be mapped and modeled across the watershed from water provisioning to flood risk reduction.
- **Review institutional options for managing natural assets.** An ecosystem services framework can be used to achieve multiple economic goals while minimizing trade-offs. Policymakers in the McKenzie Watershed should facilitate discussions about institutional improvements that facilitate the coordination of watershed activities including drinking water quality, flood risk reduction, salmon habitat restoration, climate adaptation, recreation, stormwater conveyance and forest stewardship.
- **Use ecosystem services to advance rural economic development.** By including agriculture, sustainable forestry, and access to quality outdoor recreation in economic development planning, long-term and sustainable jobs can continue to be identified, quantified and secured in the McKenzie Watershed. Restoration projects can and should be effectively linked to economic advancement, sustainability and long-term job creation.
- **Include ecosystem service valuation in accounting and decision-making tools.** Ecosystem service valuation can provide governments, organizations, and private landowners a way to calculate the rate of return on conservation and restoration investment. Beginning in late 2012, values in this report will be regularly updated using the Earth Economics' **SERVES** (Simple Effect Resource for Valuing Ecosystem Services) web-based tool.

Appendix B: Preliminary Results from the Survey of 399 EWEB Customers

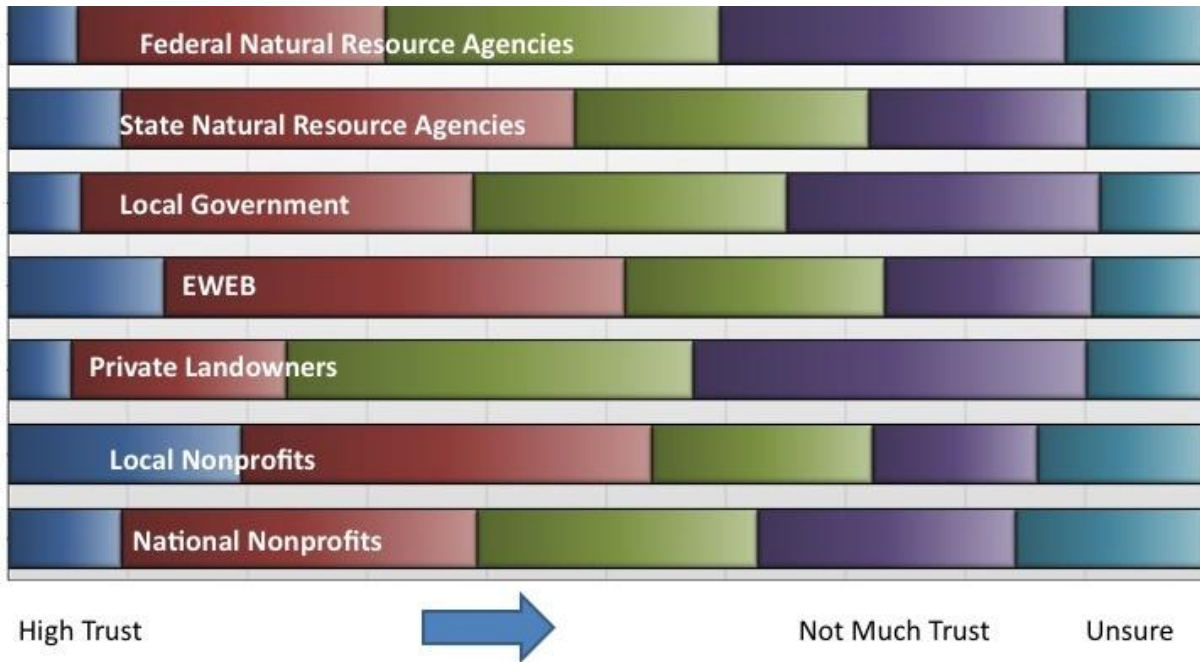
Willingness of customers to support water quality improvement projects within the McKenzie River through different amounts added to water bills (From bottom to top: Definitely Yes, Probably Yes, Unsure, Probably No, Definitely No):



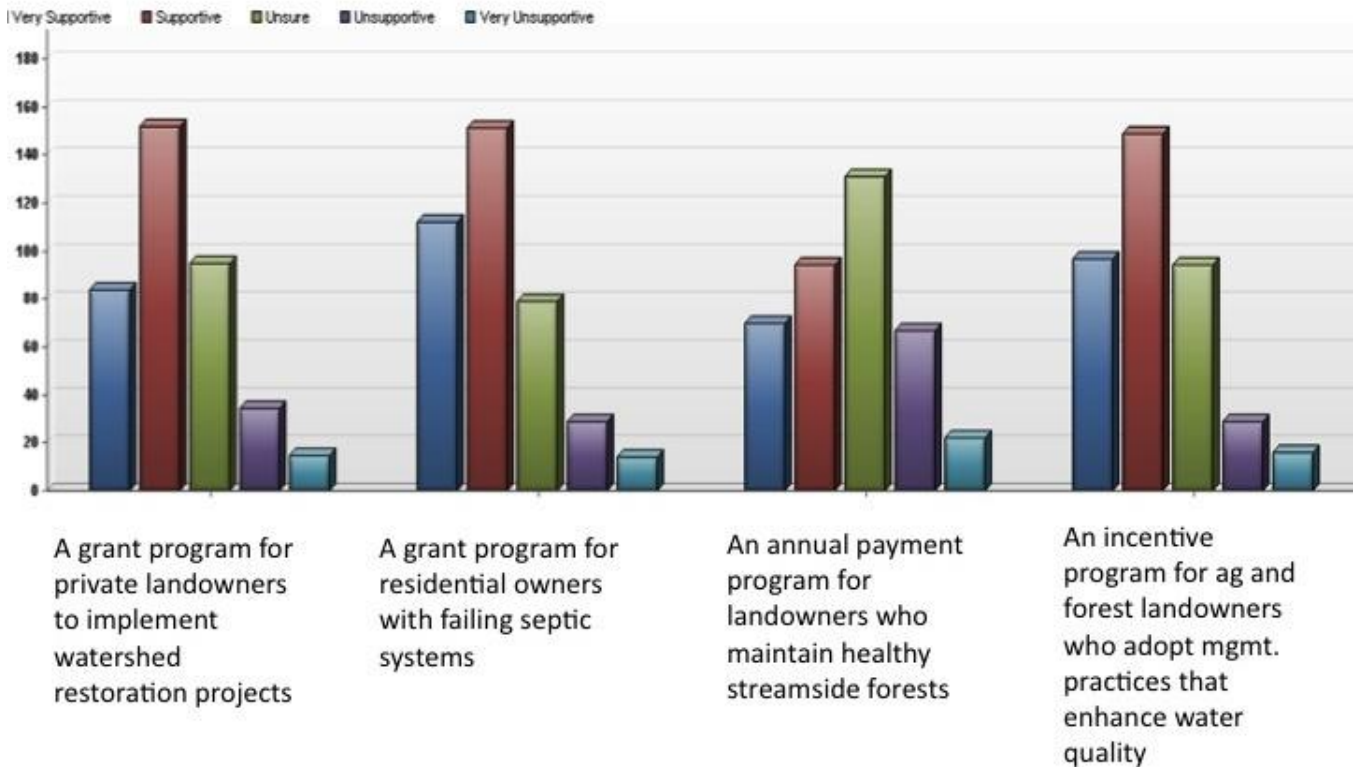
Diagrams of customers' willingness to pay \$0.50 per month to support water quality improvement projects in the McKenzie. Diagram on left shows those customers that are definitely willing to pay vs. all other categories and diagram on right shows those that are definitely or probably willing to pay vs. all other categories:



Level of trust among customers for different agencies and stakeholders in the McKenzie:



Customer support for different landowner incentive programs (from left: Very Supportive, Supportive, Unsure, Unsupportive, Very Unsupportive):



Appendix C: Background Information on Possible Marketplace Partners

Eugene Water and Electric Board (EWEB)

EWEB is a customer owned public utility. There is a 5-member Board of Commissioners which is elected by the citizens of Eugene in staggered four year terms. Authority for the powers and functions vested in EWEB is established by Chapter 10, Section 44, of the [Charter of the City of Eugene](#), (1976), as amended. EWEB is defined as a political subdivision of Eugene, a municipal corporation. Board members are NOT employed by EWEB and cannot be for 6 months after completion of term.

<http://www.eweb.org/>

Current watershed projects

EWEB received a \$45,500 grant from the Oregon Governor's Fund for the Environment to conduct a 2-year project designed to help McKenzie farmers increase economic viability while simultaneously protecting water quality. 12 project partners are joining EWEB to provide \$98,350 of matching funds and will be available to assist growers individually in one or more of 5 project areas.

- 1) *Reduce Chemical Storage on farms (free chemical collection from Lane County Waste Management).*
- 2) *Reduce chemical use-transitioning to organic or BMPs to reduce use.*
- 3) *Provide access to local markets.*
- 4) *Connect farmers with more sustainable programs in renewable energy, energy efficiency, and reduced water consumption.*
- 5) *Connect with Natural Resource Conservation partners.*

<http://www.eweb.org/waterquality/farms>

Upper Willamette Soil and Water Conservation District (Upper Willamette SWCD)

Upper Willamette SWCD is a local government entity organized under the Oregon Department of Agriculture (ODA) and established under the Oregon revised statutes (see legal authority below). Upper Willamette SWCD is classified as a municipal corporation and

is not a state agency and has no regulatory authority or responsibilities. The district is funded primarily by grants it receives from ODA and Lane County for administrative, project-specific, and technical service tasks it performs.

Legal Authority

ORS 568.225 Policy. (2) It is further the policy of the Legislative Assembly **to authorize soil and water conservation districts** established under ORS 568.210 to 568.808 and 568.900 to 568.933 **to participate in effectuating the policy set forth** in subsection (1) of this section and for such purposes **to cooperate with landowners, land occupiers, natural resource organizations, natural resource users, local governments** as defined in ORS 174.116 **and with agencies of the government of this state and of the United States in projects, programs and activities calculated to accelerate such policies.** In effectuating the policy set forth in subsection (1) of this section, **the soil and water conservation districts also shall strive to achieve the goal set forth in ORS 468B.155.** (To prevent contamination of Oregon’s ground water resource while striving to conserve and restore this resource and to maintain the high quality of Oregon’s ground water resource for present and future uses. <https://www.oregonlaws.org/ors/468B.155>)

SWCDs are local management agencies for the implementation of the Agricultural Water Quality Management Act (AgWQMA/SB1010).

http://oregon.gov/ODA/NRD/docs/pdf/water/quick_guide.pdf

ORS 561.191 reinforces ODA’s responsibility for and jurisdiction over agricultural practices and water pollution associated with farming practices. ODA investigates complaints associated with water quality problems resulting from agricultural and rural activities. In cases of violations, ODA tries to work with producers/landowners on a voluntary basis to solve the problems through education and technical assistance. Those who refuse to comply can be subject to enforcement actions including civil penalties.

<http://www.oacd.org/map.shtml>

Soil and Water Conservation Commission (SWCC)

The Oregon Legislature established the Commission in 1981 under ORS 561.395, to provide for coordination between Oregon’s Soil and Water Conservation Districts and the Department of Agriculture. The Commission’s policy making authority is to advise, develop and recommend policy to the director of the Department of Agriculture.

The Commission provides assistance and direction to Oregon’s 45 conservation districts and coordinates with the DOA, the division, NRCS, FSA, OSU, OACD, and OWEB.

<http://www.oregon.gov/ODA/SWCD/swcc.shtml>

ODA Soil and Water Conservation District (SWCD) Program

SWCD Program is one of 5 programs within the Natural Resources Division (NRD) of the Department of Agriculture (DOA). The mission of the SWCD program is to provide support, technical assistance, and administrative oversight to Oregon's 45 local SWCDs. Its major responsibilities are to administer various SWCD programs, keep district directors informed of other district activities, provide district training, and promote cooperation among districts.

Oregon Soil and Water Conservation Districts (SWCDs) have statutory authority to levy taxes with approval of local voters. As of January 2008, 10 SWCDs have received local voter approval to assess local property taxes in the form of permanent tax rates, not including Lane County.

http://www.oregon.gov/ODA/SWCD/about_us.shtml

http://www.oregon.gov/ODA/SWCD/docs/pdf/swcd_directory.pdf?ga=t

<http://www.oregon.gov/ODA/SWCD/swcc.shtml>

McKenzie River Trust

McKenzie River Trust is a nonprofit land trust formed for protection of critical habitat and scenic lands in McKenzie Basin. Community based, working with willing landowners.

The lands are acquired through donation, purchase and conservation easements. They are protected and managed by the Trust primarily for clean water, fish and wildlife habitat and productive natural landscape values. They own and protect over 1,500 acres in Western Oregon and hold conservation easements on over 1,600 acres of privately owned property.

Easements are a way for landowners to preserve ecological value and beauty of their property while maintaining ownership. The owners legally agree to restrict some uses or development of the property in perpetuity and the Trust assumes responsibility for monitoring the property to preserve the natural values. Easements will remain in effect even if property ownership changes and they are documented on the deed.

<http://mckenzieriver.org/about-us>

McKenzie Watershed Council

McKenzie Watershed Council is a volunteer, non-profit organization whose mission is to foster better stewardship of watershed resources through voluntary partnerships,

collaboration and public awareness. The Council is an advisory body to decision makers and communities of interest.

<http://www.mckenziawc.org/about.htm>

Natural Resources Conservation Service (NRCS)

NRCS, a USDA agency, provides technical and financial assistance that enable people to be good stewards of soil, water and related natural resources on non-Federal lands. The Agency employs three main strategies to meet its goals:

- 1) Cooperative conservation- seeking and promoting cooperative efforts
- 2) Watershed approach- providing information and assistance to encourage conservation.
- 3) Market based approach- facilitating growth of market based opportunities

<http://www.or.nrcs.usda.gov/index.html>

Conservation Reserve Program (CRP)

CRP is administered by the USDA's Farm Service Agency (FSA), with NRCS providing technical land eligibility determinations, conservation planning and practice implementation. This program encourages farmers to convert highly erodible cropland or other highly sensitive acreage to ecologically appropriate vegetative cover. Farms receive an annual rental payment for the terms of the multi-year contract. Cost sharing is provided to establish the vegetative cover practices. This is funded through the Commodity Credit Corporation.

<http://www.nrcs.usda.gov/programs/crp/>

Cascade Pacific Resource Conservation & Development (CPRC&D)

CPRC&D is part of a nationwide network of not-for-profit Resource Conservation and Development Areas (RC&Ds). This national program was established within the USDA to empower rural people and communities. Cascade Pacific is one of 5 Oregon RC&D councils authorized by the Secretary of Agriculture, and they receive support from the USDA/RC&D program, which is administered through the NRCS. CPRC&D works with locals to carry out conservation and community development projects, provide planning and project development assistance, provide grant reviews, funding assistance, management services, and help build partnerships.

<http://www.cascadepacific.org/who.htm>

Oregon State University Lane County Extension Service

OSU extension service faculty work with state, county and federal agencies in providing information and education to raise awareness and to help county residents learn how they can take action to improve water quality.

http://extension.oregonstate.edu/lane/farms/water_quality_resources

Appendix D: List of Relevant Websites

EWEB Websites:

- EWEB home page
<http://www.eweb.org/default.aspx>
- EWEB watershed baseline report
<http://www.eweb.org/public/documents/water/baselineReportJan2011.pdf>
- EWEB website with links to land use and development related documents including the University of Oregon's Community Planning Workshop documents
<http://www.eweb.org/waterquality/landusedocuments>

Institute for Natural Resources:

- INR home page
<http://oregonstate.edu/inr/>
- Oregon Explorer website on VIP program
<http://oe.oregonexplorer.info/ExternalContent/VIPRiparianStewardship/index.html>

Other Relevant Websites:

- Earth Economics
<http://www.eartheconomics.org/>
- Link to Earth Economics study "Nature's Value in the McKenzie Watershed"
<http://www.eartheconomics.org/FileLibrary/file/Reports/Earth%20Economics%20McKenzie%20Watershed%20rESV%20%28final%29.pdf>