

WILLINGNESS TO PAY

A Contingent Valuation Study in the McKenzie River
Watershed

Andrew C. Schurr

*University of Oregon Master of Community and Regional Planning
Exit Project Report June 2019*

Acknowledgments

I would like to thank all those who have helped, supported, consoled, and been there for me along this crazy journey. I could not have done this without you. There is a high likelihood I would be hiding in a cabin in the woods somewhere if you hadn't been there to encourage me to persevere and get this thing done. Thank you!

Special Thanks to My Project Advisors and Partners:

Professor Robert Parker for your advice, support, and good conversation throughout this entire process.

Professor Anne Brown for helping me work through my analysis, the support, and all the feedback.

Karl Morgenstern, Nancy Toth, EWEB, and the Pure Water Partner Network for allowing me to be a part of this research.

Additional Thanks to:

My family for their unwavering support even when all I wanted to do was go skiing, biking, climbing, or just about anything else.

My friends for their continuous encouragement, hugs, and good times. Couldn't have done it without you all (seriously).

The 2019 MCRP cohort for being on this crazy ride with me.



Executive Summary

Drinking water is a resource that touches all aspects of a community. It crosses nearly all boundaries and affects everyone with a tap. Quality, clean, water is an important piece of any community puzzle. But what happens upstream before we turn on the faucet? Protecting drinking water sources requires conservation and stewardship actions that extend beyond the municipal boundary or the treatment plant. Watershed protection activities funded through Payment for Ecosystems Services (PES) programs are an increasingly common mechanism for drinking water source protection. Willingness to Pay (WTP) is studied in order to determine funds collection systems and support among the affected population. This study examines the effects of the threat perception of climate change and wildfire, feelings about collaboration and communication, and levels of institutional trust on WTP for Drinking Water Source Protection (DWSP) programs in the McKenzie River Watershed. The study sample population was comprised of ratepaying customers of the local public utility the Eugene Water & Electric Board (EWEB) in the City of Eugene, Oregon.

Background

EWEB is among the largest public utilities in the state of Oregon. It provides drinking water to over 200,000 people in the Eugene/Springfield Metropolitan area. The sole source of EWEB provided drinking water is the McKenzie River Watershed located directly east of the city of Springfield with its headwaters on the Cascade Crest. The McKenzie River Watershed is composed of a mixture of land ownership split between U.S.D.A. Forest Service lands under the jurisdiction of the Willamette National Forest McKenzie River Ranger District, Bureau of Land Management lands, private timber and agricultural, and residential development.

Since the year 2000 EWEB has been engaged in a number of DWSP programs designed to protect and enhance the water quality of the McKenzie River and the health of the watershed. In 2012, the University of Oregon Institute for Policy Research and Engagement (IPRE) in partnership with Oregon State University and EWEB conducted a survey study to gauge ratepayer connections to place and resource valuations for the McKenzie River Watershed and their WTP for conservation and DWSP programs. This survey and the following analysis determined that ratepayers placed a high value on the McKenzie River Watershed and were WTP for increased protection programs. These results influenced the current DWSP program and funds collection system. In 2017 EWEB released a new *10 Year Drinking Water Source Protection Strategic Plan* that calls for expansion of current and the development of new programs and funding for increased DWSP actions. This research was conducted as part of a survey study to explore ratepayer WTP for expanded DWSP programs. Full survey results are available in the *2018 Ratepayer Survey Report* (Parker, Schurr 2019).

Previous research in the survey area has shown that place attachment and value have a significant positive influence on WTP (Nielsen-Pincus et al. 2017). The purpose of this study is

to determine what other factors effect WTP among the EWEB ratepayer population in the city of Eugene, OR; specifically:

1. How does the perception of climate change and wildfire influence WTP?
2. How do levels of institutional trust and program related communication influence WTP?
3. How do perceptions of collaborations influence WTP?

I hypothesized that climate change and wildfire would both have a positive association with WTP with variation between certain age and education demographics. Increasing levels of institutional trust would be positively associated with WTP, ratepayers who value programmatic communication would be more WTP, and ratepayers that have a favorable opinion of collaborative programs within the watershed will also be more WTP.

Methods

A survey was designed using the Tailored Design Method and sent to a random sample of EWEB residential water customers (see **Appendix B** for the full survey) and administered in November and December 2018 via a mixed method (electronic and physical mail) delivery. Results were analyzed using four binary logit models each containing the same demographic and place value controls for the dichotomous dependent WTP variable. The models examined each of the above questions in thematic isolation as well as an *All Variables* model which tested all model variable simultaneously. The dependent variable was created using maximum WTP dollar amounts indicated by survey respondents divided into two categories: yes, WTP more than the current annual average collection; no, WTP less than current average.

Results

Survey response was significant at the 95% confidence interval with a margin of error of $\pm 3.4\%$. Respondents trended older, more educated, and higher income than the Eugene population. Sample weights for age, income, and education (each was found to have a bivariate significant relationship with the WTP dependent variable) were created to account for potential response bias and to create comparisons in the sample. The *Age Weighted All Variables* (target) model proved to be the most predictive based on the highest r^2 value.

Results indicated that place value and connection are the most important and predicative factors affecting WTP among this sample population, confirming previous research. The hypothesis was rejected for both climate change and wildfire threat perception in the target model but when tested in isolation belief that climate change is a threat to the watershed proved to be a positive predictor of WTP while wildfire was not. Institutional trust and feelings associated with collaboration had mixed results with some combinations of institutions engaged in collaborative work being positively associated with WTP and other negative leading to partial support for the hypothesis. Communication was not associated with WTP in the target model but proved to have a negative association when tested in isolation rejecting the hypothesis.

Conclusions

The contribution of the McKenzie River Watershed to quality of life (place value and relationships) proved to be the most consistent and important predictor of WTP. Across all models, there was little to no variation in significance level or association. It was constantly positive regardless of weighting or other variable controls. Larger institutions were generally less trusted than smaller, with the exception of similar levels of trust given to Local and State level government, and local institutions such as EWEB or local Nonprofit Organizations were the most trusted. However, trust levels were not associated with WTP unless measured in relationship to collaborative arrangements with differing results. Communication, in any of the forms tested, was not associated with WTP in the target model and only negatively when tested in isolation. This leads me to conclude that communication is not a predicting factor, and as mentioned collaboration is only a positive predictor of WTP when associated with specific arrangements but can also act as a negative predictor given certain circumstances. These results lead me to make the following recommendations to EWEB:

1. EWEB should substantially increase the DWSP budget. This is supported by a large majority of their ratepayers. When doing so actions should be related to the benefits to place and the environments of the watershed first and drinking water quality second to capitalize on ratepayer place connection and values. Efforts should be taken to build a better connection between the watershed and drinking water resources.
2. Programmatic communication should be targeted, informative, direct, and relatively infrequent. EWEB should focus DWSP messaging to only information about current action and avoid regular general updates in order to increase ratepayer knowledge without inducing communication fatigue.
3. As the most trusted entity tested in the survey EWEB should lead in any collaborative relationship. Statistical analysis proved that working with EWEB helped overcome high levels of distrust. It is important to understand the opinions associated with entities engaged in collaborative programs. This should be leveraged as DWSP programs expand.
4. Additional study should be conducted about DWSP payment collection and a dedicated fund established as a separate and transparent fee item.
5. Place based messaging and communication strategies should be implemented to build connections between drinking water and watershed resources among ratepayers. This is applicable to all conservation or DWSP programs in this study area.

While these results and recommendations are specific to the EWEB service area they can inform any public utility looking to implement a PES program.

TABLE OF CONTENTS

CHAPTER 1: INTRODUCTION AND BACKGROUND	1
<i>Study Area and Context</i>	<i>2</i>
<i>Previous Research in the McKenzie River Watershed and the EWEB Ratepaying Population</i>	<i>4</i>
<i>Payment for Ecosystems Services</i>	<i>4</i>
<i>Contingent Valuation</i>	<i>5</i>
<i>Support for Payment for Watershed and Drinking Water Supply Protection</i>	<i>6</i>
CHAPTER 2: SURVEY, DATA COLLECTION, AND RESPONSE	8
<i>Question Format</i>	<i>8</i>
<i>Survey Response</i>	<i>11</i>
<i>Respondent Characteristics.....</i>	<i>11</i>
<i>Feelings about the Watershed and Place Valuation</i>	<i>14</i>
<i>Survey Question Response</i>	<i>14</i>
<i>Willingness to Pay.....</i>	<i>15</i>
CHAPTER 3: METHODS	16
<i>Research Questions.....</i>	<i>16</i>
<i>Methods.....</i>	<i>16</i>
<i>Variable Coding.....</i>	<i>17</i>
<i>Sample Weighting and Variable Selection</i>	<i>17</i>
CHAPTER 4: RESULTS.....	20
<i>Effect of Control Variables in Model Iterations</i>	<i>20</i>
<i>Target Model Summary</i>	<i>20</i>
CHAPTER 5 DISCUSSION AND CONCLUSIONS.....	23
CONCLUSIONS.....	26
<i>Further Research.....</i>	<i>26</i>
<i>Recommendations to EWEB.....</i>	<i>27</i>
REFERENCES.....	31
APPENDIX A: ADDITIONAL MODELS	34
APPENDIX B. SURVEY INSTRUMENT	37

Chapter I: Introduction and Background

The McKenzie River, located in Lane County, Oregon, provides the sole source of utility supplied drinking water for the city of Eugene. The Eugene Water & Electric Board (EWEB) is among the largest publicly owned utilities in the state of Oregon¹ and manages this supply, providing drinking water to over 47,000 households. For over twenty years EWEB has engaged in drinking water source protection (DWSP) programs designed to maintain and improve the water quality of the McKenzie River. The first dedicated DWSP plan was adopted in 2001 (EWEB 2001) and included a number of risk-based assessment, land owner partnership, and collaborative conservation programs.

In 2012 the Institute for Policy Research and Engagement (IPRE) at the University of Oregon, (then the Community Service Center) conducted a survey to gauge ratepayer place connections, the value placed on the greater watershed, and the effects of these values on their willingness to pay (WTP) for environmental protection (Parker et al. 2013). This survey, funded by the National Institute of Food and Agriculture (NIFA) was a joint effort between the University of Oregon, Oregon State University, and EWEB. The scope was broad and included both business and individual support for payment for ecosystems services (PES) programs and assessment of resource valuation among the ratepayer population (Parker et al. 2013). The results and subsequent research informed the current suite of DWSP programs (Parker, Schurr 2019).

This study is an outgrowth of earlier IPRE research and explores several different, but connected, themes. The first is an assessment of continued support for PES programs and WTP among the EWEB ratepayer population. The second is an assessment of how select social and demographic attributes are associated with WTP. EWEB recently released a *10 Year Drinking Water Source Protection Strategic Plan* (EWEB 2017) which outlines a series of proposed actions and programs. The Pure Water Partners (PWP) program is one such program², and is designed to work with land owners and managers in the watershed for collaborative resource protection. Information from the 2018 Ratepayer Survey and follow up research will directly impact funding for PWP related actions and other DWSP programs (EWEB 2017).

Understanding motivations connected with shared resource conservation, particularly ones under multiple management jurisdictions, can inform future conservation planning. All PES systems require buy-in from stakeholders in the form of payment and/or support. Attitudes associated with the resource in question, perception of threats to the resource, levels of institutional trust of the entities involved, and how programs are administered and

¹ EWEB: About Us. <http://www.eweb.org/about-us>

² The PWP program is an evolution and expansion of the Volunteer Incentive Program (VIP) which partnered with private land owners in the McKenzie River Watershed on riparian health and impact mitigation projects through financial and assistance incentives. <http://purewaterpartners.org>

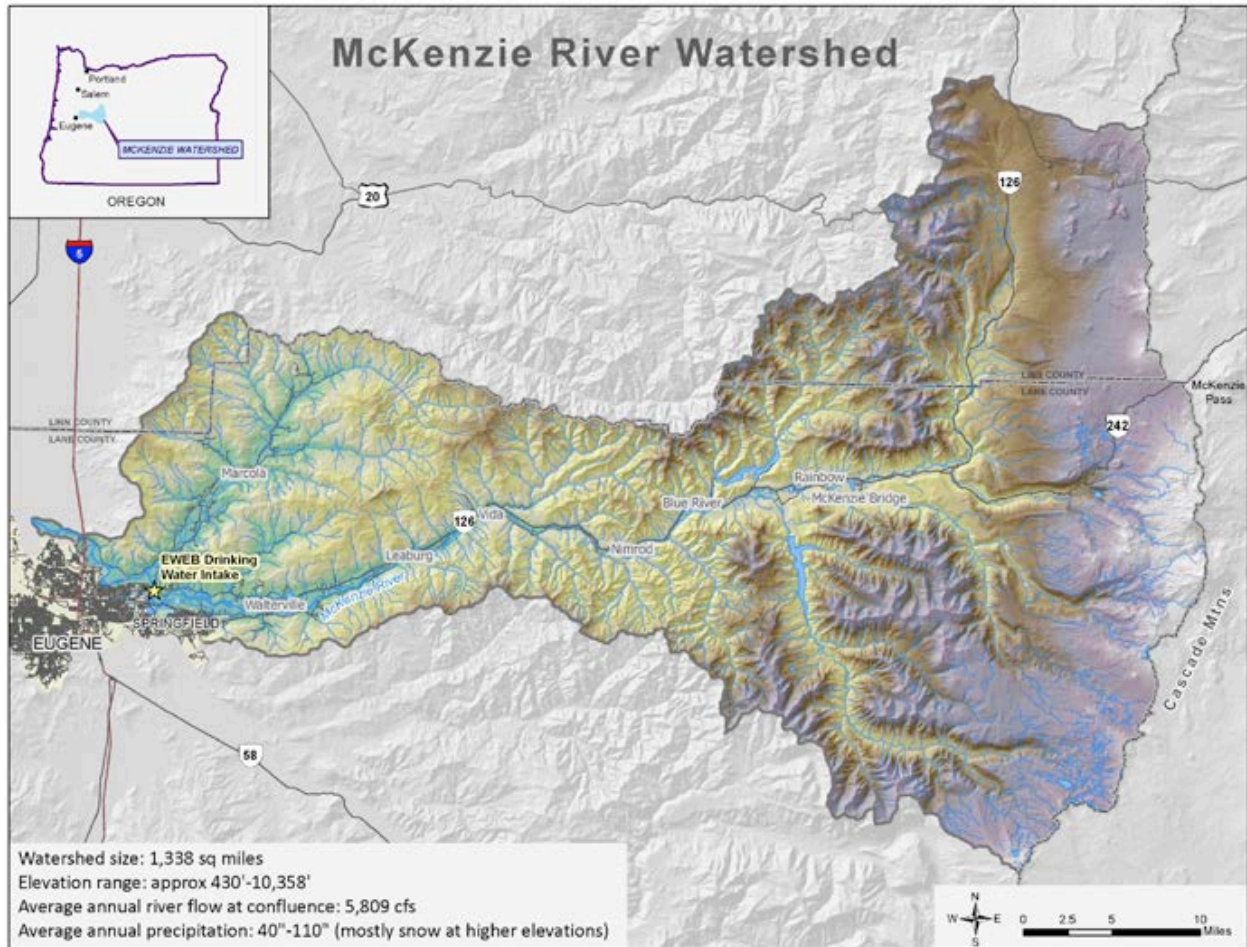
communicated about may have some effect. Study of WTP for PES programs among stakeholders allows us to build a picture of what those attitudes and motivations are and how to engage with them in a meaningful way.

This study was designed to explore social and demographic factors that are associated with WTP for drinking water source protection within the context of the Southern Willamette Valley in Oregon. Research has shown that perception of threats or detrimental effects to a public resource influence WTP (Obeng, Aguilar, Xavier. 2017). Research also shows that relationship to place (Nielsen-Pincus et al. 2017) and community values surrounding shared resource influence WTP (Adhikari et al. 2017). By exploring these factors along with demographic attributes, issues of trust, and program communication and structure, this research builds on the body of knowledge available to researchers and planners alike. Specifically asking about emerging threats and trends within the public consciousness (climate change, increased prevalence of wildfire, and collaborative resource management) can help build more effective programming for resource protection in the future.

Study Area and Context

The McKenzie River Watershed is located east of the Eugene/Springfield, OR metropolitan area with its headwaters on the western slope of the Cascade Mountain crest at Clear Lake. The river flows approximately 90km (56mi) to the floor of the Willamette Valley where it joins the main fork of the Willamette River. The EWEB drinking water intake is located northeast of the city of Eugene at the Hayden Bridge Water Filtration Plant (**Figure 1**). The watershed is divided into three general geographic areas. The upper watershed is dominated by United States Forest Service (USFS) managed lands under the jurisdiction of the Willamette National Forest McKenzie River Ranger District. It is comprised of several congressionally designated Wilderness areas, timber lands, and recreation/multi-use forest lands with a limited number of private developments and inholdings. It is home to a number of popular recreation sites, vista points, and trail systems that receive regular visitation and use. The middle and lower watershed are dominated by private timber, agricultural, some Bureau of Land Management lands, and residential development. Residential and agricultural development increase as one travels west on Oregon Highway 126. The entire McKenzie River Watershed is a popular recreation destination for Willamette Valley and Central Oregon residents offering easy access to a number of recreation sites along its entire length.

Figure 1 Map of the McKenzie River Watershed



Source: Eugene Water & Electric Board

EWEB is a public utility that provides water and electric service to the City of Eugene and a small portion of the surrounding area. The McKenzie River is the sole source of EWEB drinking water for both residential and commercial customers. EWEB serves approximately 200,000 residential customers in 47,126 households as of 2018. In 2000, EWEB prepared a DWSP Plan (EWEB 2000) to meet the requirements of the 1996 Safe Drinking Water Act Amendments which was formally adopted in 2001. The plan's primary goal was to:

"...measure the balance between watershed health and human use over time and to implement actions that maintain exceptional water quality for current and future generations." (EWEB 2017 p 6)

Previous Research in the McKenzie River Watershed and the EWEB Ratepaying Population

In 2012, IPRE completed a survey in partnership with EWEB and Oregon State University gauging ratepayer and land owner place connections to the McKenzie River Watershed and WTP for watershed protection programs (Nielsen-Pincus et al. 2017, Parker et al. 2013). This survey broadly explored perceptions and connections to place and the general willingness to pay for its protection using hypothetical dollar “bid” amounts and non-specific program descriptions such as “water quality protection”. Results showed that EWEB ratepayers placed high value on the McKenzie River Watershed and would be willing to contribute a non-specified amount in the range of an additional \$0.50 to \$1.00 per month to fund protection programs (Parker et al. 2013). These results helped develop the current DWSP program suite. The current funding system collects \$0.12 per kilogallon used for an average annual amount of \$13.32 per household.

In 2017, EWEB released a new *Drinking Water Source Protection Ten Year Strategic Plan* (EWEB 2017) which expands existing DWSP programs. The plan lays out specific strategies designed to protect drinking water quality and promote collaborative land management and conservation for increased watershed health. Findings from the 2012 Ratepayer Survey and subsequent research demonstrated that place valuation has a positive association with WTP (Nielsen-Pincus et al. 2017). These findings are consistent with findings in the available literature which indicate a high value is placed on ecosystems services and overall environmental quality generally in real benefits received and perceived cultural value (Nesbitt et al. 2017). Additionally, value placed on shared resources and ecosystems increases as the connection and perceived reliance on the resource in question increases among a population (Adhikari et al. 2017. Cáceres et al. 2015).

Payment for Ecosystems Services

PES programs are an established mechanism for incentivizing and supporting environmental management practices through a variety of funding mechanisms (Nielsen-Pincus et al. 2017). They encourage conservation related partnerships at a programmatic level by creating an avenue to fund and maintain often costly coordinating actions (Hansen et al. 2018). Commonly, PES programs are incentive-based. Participants either perceive a direct benefit from the conservation of a resource or they may receive direct payment to participate in conservation efforts (Hansen et al. 2018, Muradian et al. 2010). This establishes a transactional anthropogenic relationship which has been criticized for its financial or benefit-based incentive structure via a quasi-market system (Hansen et al. 2018. Kosoy et al. 2006).

Through a market lens a PES system requires a willing seller (in our context a public utility providing drinking water) and a buyer (the ratepayer receiving benefit). This in turn creates a mechanism for establishing a monetary value for the service in question. By some arguments this disincentivizes the adoption of environmentally sustainable or conservation-based

behavior in favor of a reward-based system that relies on an over-simplification of complex ecosystem relationships (Kosoy, Corbera 2010). Taken to the logical end, this criticism juxtaposes a moral imperative for conservation against a more technocratic approach which attempts to place monetary value on a resource as a means of encouraging its preservation and stewardship (Ernstson, Sorlin 2013).

There are conflicting views regarding the effectiveness of such market or incentive-based PES programs. This is particularly true when it comes to behavior change, effective outcomes, and the general acceptance of a “win-win” solution framework (Muradian et al. 2013). PES programs are generally accompanied by a lack of recognition of the institutional framework required to maintain them, creating a challenge for overall program sustainability. This is further amplified in cases of multijurisdictional resources where ownership and authority are not clearly apparent to the population interacting with them (Jespersion, Gallemore 2018).

However, these criticisms assume that the buyer has an effective way to opt-out and that benefits received from the conserved service are optional. In the case of public water supply, ratepayers within the boundaries of the service area may not have an effective opt-out option. This may be the result of municipal regulation requiring a connection to the water delivery and sewer system or the lack of the ability to procure an individual water supply through such means as a well, or the purchase of bottled treated/potable water. In a sense, many utility water customers participate in a PES market out of necessity. They are receiving a direct benefit from efforts to maintain the supply and thus can be seen as functionally required to contribute (Kosoy, Corbera 2010). The question then becomes at what level is participation expected and supported by the population? The study of WTP seeks to answer this question. WTP is defined as an econometric measure which estimates an individual’s valuation of a resource and their WTP for it (Chaterjee et al. 2017). This study examines one resource in particular: drinking water from the McKenzie River Watershed.

Contingent Valuation

Drinking water source protection, in the form of greater watershed conservation efforts, occupies a non-market space. It is difficult to monetize an environmental good or service like water quality when consideration of the larger system cannot be bought or sold in a traditional market (Mueller 2016). This necessitates the creation of a pseudo-market valuation technique to explore WTP for the good or service in question. The most common way to study WTP is the use of a contingent valuation (CV) framework.

The CV method creates a hypothetical market place or situation-based scenario in which respondents are asked to self-report their WTP for a good or service (Chaterjee et al. 2017, Loomis, Gonzalez-Caban, Gregory 1996). A respondent reacts to the description of the financial mechanisms designed to collect payment, may be presented with options, and ultimately places a value on the service in question. Question format varies depending on context and is designed to elicit a certain type of response; i.e., general support in non-specific categorical dollar amounts and ranges, or a more specific self-defined dollar amount (Loomis,

Gonzalez-Caban, Gregory 1996). Generally, these models are constructed in a benefit-received framework, in which respondents indicate how much they are WTP for a good or service in the context of how it affects them or their community directly (Mmopelwana, Kgathi, Thukuza 2005. Ahdkari et al. 2017). CV methods have been criticized for relying on stated preference rather than actual observed behavior (Hausman 2012). While variations between reported preference and actual behavior certainly exist, CV methods have been shown to provide a reasonable approximation of resource valuation when compared with study of actual or simulated transactions (Murphy, Stevens 2016).

Public good, or common resource, valuation presents another challenge. Actual demonstrated WTP may be less than the stated value due to the tragedy of the commons, or free-rider, phenomenon associated with shared resources (Carson, Flores, Meade 2001). Despite these criticisms, CV continues to be widely used and many of the theoretical or conceptual drawbacks can be mitigated through study design (Carson, Flores, Meade 2001). When compared to other pricing models, CV has produced similar outcomes (Loomis 2011). Previous study by Nielsen-Pincus et al. (2017) in the EWEB service area addressed these criticisms by relying on clear explanation and the presentation of different payment levels on a certainty of WTP scale (Nielsen-Pincus et al. 2017). CV methods have been used to model WTP for a variety of resources. One such study in Oregon used a ballot referendum model to ask respondents to “vote” for a payment program for the protection of old growth forest (Loomis et al. 1996). Other CV studies have addressed watershed protection and restoration and have used ordinal bid-levels or an open-ended approach allowing respondents to write in any dollar amount (Chatterjee et al. 2017, Adhikari et al. 2017, Mueller 2013).

Support for Payment for Watershed and Drinking Water Supply Protection

PES programs are a means of engaging a population in conservation or resource protection actions. Commonly, utility service providers seek to engage ratepayers in a number of different ways either as buyers (those contributing funds) or as active participants in restoration activities (sellers, those receiving funds for participation in programs) (Nielsen-Pincus et al. 2017. Kosoy et al. 2006). Influences on either role can come from a number of sources.

A survey study in Australia has shown that rate payers are willing to accept reduced level of water service if the reduction is related to threat mitigation (Hensher, Shore, Train 2005). Ratepayers indicated that clear communication about threats and mitigation measures affect WTP, but overall resource valuation is not reduced by lower service levels provided the reduced service is seen as justified (Hensher, Shore, Train 2005).

Risk perception also plays a role in WTP for watershed resources. A national survey conducted in the United States demonstrated that even though there is a general lack of understanding surrounding the term “ecosystem services” individuals increase their WTP when risk to the resource is perceived as increasing. Interestingly, it does not necessarily need to affect them

directly. A perceived risk to property, human communities, and proximity were found to be strong determinates of WTP (Obeng, Aguilar 2017).

The research I present in this paper, however, only addresses two general threats in the context of this particular watershed system: wildfire and climate change. Additional research into other more specific threats or threat dimensions should be conducted within this population to determine additional associations with WTP.

Proximity and direct effect to the individual also increase WTP. Generally, the effect of proximity decreases as the perception of direct personal or community threat increases (Adhikari et al. 2007). Age, income, rural or urban residence, and education also influence WTP for PES to various degrees, but when controlled for other factors do not serve as good indicators by themselves (Obeng, Aguilar 2017). Generally speaking, WTP for PES programs is higher among politically liberal, more highly educated, and younger populations. This has been attributed to higher levels of environmentally oriented value systems in these populations (Wan, Qiping, Choi 2017). However, as explored by Adhikari et al. (2017), this changes as proximity and threat perception changes, and WTP will likely increase as feelings of direct benefit increases (Mueller 2013).

Given that demographic traits such as age, income, and education may not provide the best predicative picture of WTP, other aspects must be considered. Place valuation and connection to the resource in question has been shown to be a particularly strong indicator of WTP. Individuals who have a personal connection to place or a resource are more likely to be WTP for its protection or conservation. This has been observed in the McKenzie River Watershed and EWEB service area (Nielsen-Pincus et al. 2017).

Higher levels of institutional trust in the organization responsible for maintaining water quality and service delivery, as well as that entities adherence to positive social and community norms, has been associated with higher WTP. These traits, summarized as social capital, take on a number of forms. If a population sees an entity or agency as more community minded or trustworthy, they have been shown to be more open to higher payment amounts for services or resource protection (Polyxou, Evangelinos, Halvadakis 2010).

Another factor affecting WTP includes political orientation; individuals who identify as liberal tend to have more environmentally oriented value systems and are more open to higher payment amounts (Wan, Qiping, Choi 2017. Nielsen-Pincus et al. 2017). Despite research into how threat perception influences WTP, there is little available research about the direct effect of belief in climate change. This is likely the result of the relatively recent emergence of climate change within the larger societal social consciousness as an intersectional issue. It is an area in need of additional study.

Wildfire, however, has been used as threat measure evaluation in multiple studies (Adhikari et al. 2017, Mueller 2013) and has been found to increase WTP. It is unclear if increased WTP is the result of the threat of wildfire or simply due to increased threat generally. Another focus

of this study is collaboration, and collaborative resource conservation. Case study research in Portland, OR has found strong support for collaborative community-based watershed protection programs (Shandas, Messer 2008) but this has not extended to WTP.

Chapter 2: Survey, Data Collection, and Response

A stratified random sample of 3,000 households was identified from the EWEB residential ratepayer population within the primary service area of the city of Eugene. The sample was distributed across the eight different EWEB commissioner wards and drawn from EWEB's residential utility billing list (Parker, Schurr 2019).

The survey instrument was designed using the Tailored Design Method, (Dillman, Smyth, Christian 2014) consisted of thirty questions and was administered in November and December 2018. Delivery was a mixed-method split between electronic (email) and physical mail. Approximately 60%, (1,861) were delivered to registered ratepayer email addresses. The remaining approximately 40%, (1,139) were delivered via physical mail to a registered bill paying address. Both the electronic and physical surveys were identical with only small exceptions to accommodate delivery method. Recipients of the mailed survey were contacted a total of three times: an introductory postcard, the physical survey packet, and reminder postcard sent several weeks later. Recipients of the electronic survey were contacted up to seven times by email over the course of the six-week survey period. The electronic survey was built using the Qualtrics™ online survey analytics platform under the University of Oregon institutional license.

Questions were a mixed format. Approximately half were multi-item five-point Likert scale response questions and the remainder were a mixture of multiple-choice selection, dichotomous yes/no response, ranked choice, and open-ended write-in response. Questions were focused on ratepayer perceptions and feelings about the watershed, threat perception, feelings of institutional trust, opinions surrounding collaboration and communications about drinking water source protection programs, willingness to pay and preferred funds collection methods, and respondent demographics.

Question Format

The full survey instrument is available in **Appendix B**. This section addresses only the questions relevant to the research presented in this paper: connection to and awareness of the resource (drinking water from the McKenzie River and the greater watershed), threat perception of wildfire and climate change, institutional trust, feelings associated with collaboration and communication as they relate to drinking water source protection programs, willingness to pay, and respondent demographics.

Connection and awareness of the watershed was explored using a series of value assessment questions. The section opened with a dichotomous yes/no question asking if the respondent

is aware their drinking water comes from the McKenzie River. This was followed by a six-option question about frequency of visitation to the McKenzie River Watershed with options ranging from “*More than once a week*” to “*Never*” and a five-option ranked choice question asking the respondent to assess how the McKenzie River Watershed enhances their quality of life.

Drinking source water quality was framed by introducing the subject *relative* to other environmental conservation efforts such as air quality and salmon habitat restoration. Respondents were asked to rank how important water quality was in relation to other concerns on a five-point scale ranging from *Extremely Important* to *Not Important at All*. This was followed by questions specific to the McKenzie River Watershed including:

“How important is the quality of drinking water from the McKenzie to you?”
“How urgent do you think it is for EWEB to put into action programs that maintain or restore the water quality of the McKenzie River Watershed before drinking water comes to your tap?”

Threat perception of climate change and wildfire was measured using a five-point Likert agreement scale asking respondents how much they agreed with the following statements:

“Wildfire is a threat to water quality in the McKenzie”
“Climate change is a threat to water quality in the McKenzie”

Response options included *Strongly Agree, Agree, Neither Agree nor Disagree, Disagree, Strongly Disagree*. Within the same question respondents were also asked to respond to a series of three statements about collaborative partnerships between EWEB and nonprofit organizations, state and federal agencies, and private landowners to maintain and enhance water quality. Feelings about collaboration more generally were tested using the same agreement scale by asking:

“I am more likely to trust government agencies when...”
“...they work together.”
“...they partner with non-profit organizations.”
“Collaboration and partnership produce better outcomes.”

Institutional trust was measured using a ranking scale that included; *Completely, A lot, Somewhat, Not Much, and Unsure*. Respondents were asked to rank their level of trust for each of the following agencies or entities involved in supporting natural resource health:

“Federal natural resource agencies”
“State natural resource agencies”
“Local Government”
“Eugene Water & Electric Board”
“Private landowners in the watershed”

“Local Non-Profit Organizations”
“National Non-Profit Organizations”

Respondent feelings associated with communication were tested by asking them to rate the value of regular communication, framed as approximately monthly, regarding activities affecting the watershed. Options ranged from *Extremely Valuable* to *Not at all Valuable*. Also included was a Likert agreement scale question asking respondents to assess level of agreement with the statement:

“I feel better about programs and projects when I feel informed.”

The survey assessed WTP by using a contingent valuation methodology based on a study conducted by Colorado State University and the U.S.D.A. Forest Service Pacific Southwest Research Station (Loomis, Gonzales-Caban, Gregory 1996). WTP was the last substantive subject addressed. This was done deliberately as a means of providing program context through the previous questions prior to assessing payment amount preference. Payment amount preference and WTP was assessed by asking the following:

“What is the maximum your household would pay each year for the EWEB Source Water Protection Program that would maintain or improve drinking water quality for EWEB customers now and in the future?”

The issue was framed by first asking two questions explaining the current funds collection system which included an explanation of how fees are assessed and the average current per household collection amount. These questions asked respondents to indicate their preferred collection method given a selection of options, and about current program support more generally. Current program support was presented as a dichotomous yes/no question framed as a referendum before the EWEB board of commissioners.

“Suppose this EWEB Source Water Protection Program proposal was under consideration by the EWEB Board of Commissioners. This program would maintain or improve drinking water quality for EWEB customers now and in the future. If it cost your household \$13.32 each year would you support this program?”

Presenting current support in this way provides us with information about WTP for the current program along with a general sense of support among our sample population while simultaneously providing respondents with agency in the choice. Respondents are given the ability, based on what they have learned/considered earlier in the survey, to decide if the existing program is valuable to them at the current average funding level (Loomis, Gonzales-Caban, Gregory 1996). Additional payment preference/support was addressed by asking the maximum amount a household would be willing to pay. Responses indicating a lower than current average WTP show a lack of overall program support or that current collection is seen as too high, while amounts above current average indicate greater support along with support for additional payment.

Respondent demographic information was collected in the final section of the survey. Age, income, education, race/ethnicity were collected by asking respondents to classify themselves into one of several categories. Home ownership was assessed by asking respondents if they rent, own, or occupy without payment their current living arrangement. Other demographic traits such as household size, years of residence, and zip code were also collected. The final characteristic information collected was voter registration and activity. The 2012 Ratepayer Survey asked respondents to identify their political ideology on a five-point scale from very liberal to very conservative (Parker et al. 2013). This was used in analysis by Nielsen-Pincus et al. (2017) to determine its effect on WTP (Nielsen-Pincus et al. 2017). Due to concerns from EWEB about the current national and regional political climate, as well as the survey's proximity to the 2018 midterm election, this question was not asked. As a proxy for political ideology, voter registration in the state of Oregon and voting activity in the most recent election was used as a means to gauge political involvement. Assuming a sufficiently random and representative sample, future analysis could compare voter registration and activity with individual precinct results to gain an understanding of how political ideology may have changed over time. This is, however, beyond the scope of this analysis.

Survey Response

The full sample size was 2,960 households. Forty surveys of the original 3,000 sent were returned as undeliverable due to addressing errors. A total of 815 usable responses were received, 661 to the electronic survey and 166 returned by mail. Total response rate was 27%. Electronic response rate was 37% and mail response was 15% which is indicative of issues of current billing address and survey response trends more broadly. Total response, when an assumption of randomness is applied, is significant at the 95% confidence level with a margin of error of $\pm 3.4\%$. Survey response contained sampling differences from that of the general Eugene population. For example, younger, and lower income individuals were under sampled and homeowners were over sampled. Steps were taken (see **Methods**) to determine if response bias was present and weighting was conducted to account for any potential bias that may have occurred. While the exact demographics of the ratepayer population is unknown, for the purpose of analysis I am assuming that they closely resemble that of the Eugene population and am using the 2017 5-Year American Community Survey U.S. Census estimate as a proxy for comparison.

Respondent Characteristics

Table 1 details respondent characteristics. The majority of respondents trended older than the population of Eugene, with a large over sampling of older age brackets. There were smaller discrepancies in the middle age brackets, 35-44 and 45-54. These results may, in part, be influenced by the fact the survey was sent to the registered bill payer for each household. Some renters may not pay for water service; in this case the landlord or property owner would have received the survey. Homeowner populations tend to skew older while younger

populations, particularly in the sample area which is the home to a major public university, are more likely to rent. The survey response gender identity mix closely resembles that of the City of Eugene. The majority of survey respondents identified as white, which is also true of the population of Eugene. The response contains a much lower percentage of lower income households (those making less than \$15,000) than that of the City of Eugene, while the middle incomes match relatively well and higher incomes were oversampled. Respondents skewed towards higher levels of education than that of the Eugene population. Sixty-two percent of respondents indicated they possess a bachelor's degree or higher while this is true for only 34% of the general population. Voter registration and voter activity also trended high with 96% of respondents indicating that they are registered to vote in Oregon and 95% indicating that they voted in the most recent election. Homeowners were also represented at a much higher rate than renters in the survey response.

Table 1 Survey Respondent Demographic Characteristics

Respondent Characteristic	Categorical Value	Total	% Response	% Eugene Population
Age		703		
	18-24	10	1%	19%
	25-34	66	9%	14%
	35-44	100	14%	12%
	45-54	112	16%	11%
	55-64	152	22%	12%
	65+	263	37%	15%
Income		674		
	<\$25,000	198	12%	29%
	\$25,000-\$49,999	155	22%	23%
	\$50,000-\$74,999	118	23%	17%
	\$75,000-\$149,999	147	29%	22%
	\$150,000+	57	14%	8%
Education		704		
	Less than High School Graduate	6	1%	7%
	High School Graduate (or Equivalency)	59	8%	18%
	Some College or Associate Degree	207	29%	41%
	Bachelors Degree	217	31%	20%
	Graduate Degree or Higher	215	31%	14%
Race/Ethnic Identity		702		
	White	569	81%	79%
	Black, African American	1	0.1%	2%
	Native Hawaiian, Other Pacific Islander	1	0.1%	0%
	Latino/Hispanic	15	2%	10%
	American Indian, Alaska Native	10	1%	1%
	Asian	13	2%	4%
	Prefer Not to Identify	75	11%	X
	Other	18	3%	5%
Home Ownership		702		
	Rent	119	17%	48%
	Own	583	83%	52%
Voter Registration		707		
	Registered in OR	676	96%	x
	Not Registered	31	4%	x
Voted in 2018 Midterm		694		
	Yes	652	94%	x
	No	42	6%	x

Source 2018 Ratepayer Survey, American Community Survey 5-Year Estimates tables: S0101, DP03, S1501

Feelings about the Watershed and Place Valuation

Most respondents (80%) were aware that their drinking water comes from the McKenzie River. This is an increase over 2012 results, when about three-quarters (74%) reported knowing their drinking water source (Parker et al. 2013). Similarly, a majority of respondents indicated that the McKenzie River Watershed enhances their quality of life: 36% view it as critical to, and 40% greatly enhances their quality of life. This is a slight increase over 2012 levels (Parker et al. 2013).

Despite high awareness and appreciation, relatively few respondents visited the watershed. Most respondents indicated that they visit a few times a year (43%) or not at all (31%). The vast majority of respondents (98%) indicated that the water quality of the McKenzie River Watershed was either extremely important or very important. A majority (78%) feel that implementing actions to maintain or restore water quality in the McKenzie River Watershed is either very urgent (32%) or extremely urgent (46%). These elements taken together indicate that the sample population places a high value on the McKenzie River Watershed.

Survey Question Response

When asked to “*what degree*” respondents agreed that wildfire was a threat to the water quality of the McKenzie River Watershed, 36% strongly agreed and 43% agreed. Asked about climate change, 51% of respondents strongly agreed it was a threat, while 30% agreed. This indicates that among the sample population, both wildfire and climate change are considered substantial threats to water quality within the watershed. Institutional trust levels varied with EWEB being the most trusted entity and private land owners the least.

Table 2. Rankings of Trust Given to Different Institutions that could Implement Programs to Support Natural Resource Health in the McKenzie River Watershed

Institution	Level of trust in organizations to support natural resource health					Number of Respondents (n)
	Completely	A lot	Somewhat	Not much	Unsure	
Federal natural resource agencies	5%	20%	44%	26%	4%	749
State natural resource agencies	8%	41%	41%	7%	3%	749
Local Government	7%	39%	39%	13%	2%	746
Eugene Water & Electric Board	16%	48%	28%	5%	2%	744
Private landowners in the watershed	4%	15%	45%	30%	7%	747
Local Non-Profit Organizations	17%	42%	29%	7%	6%	747
National Non-Profit Organizations	10%	35%	35%	13%	7%	747

Source 2018 EWEB Ratepayer Survey

Trust was higher when associated with certain collaborative arrangements. **Table 3** shows that a majority (69%) percent of respondents agreed or strongly agreed they are more likely to trust government agencies when they work together and 73% agreed or strongly agreed they are more likely to trust government agencies when they work with nonprofits.

Table 3. Level of Agreement with Statements Regarding Collaboration and Communication

Statement	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Number of Respondents (n)
I am more likely to trust government agencies when they work together	18%	51%	25%	5%	1%	751
I am more likely to trust government agencies when they partner with non-profit organizations	23%	50%	22%	4%	1%	752
Collaboration and partnerships produce better outcomes	38%	49%	12%	1%	0%	750
I feel better about programs and projects when I feel informed	32%	58%	9%	1%	0%	751

Source 2018 EWEB Ratepayer Survey

Asked about regular communication more generally, a majority of respondents (69%) indicated that they find regular communication (approximately monthly) about activities affecting the McKenzie River Watershed valuable to some degree, moderately valuable (37%), or very valuable (32%). Only 12% rated this level of program communication to be extremely valuable. This indicates that our sample would prefer targeted communications but does not require regularity.

Willingness to Pay

Respondents were overwhelmingly supportive of the current DWSP program (92% support) at the current average collection amount of \$13.32. When asked what the maximum they would be WTP, amounts ranged from \$0 to \$3,000. Amounts over \$300 (0.006% of responses) were removed as outliers over a concern that there had been either a data entry error or respondents did not fully understand the question. In total, a majority (89%) of respondents indicated they are willing to pay at least \$13.32 and most (75%) indicated they are willing to pay \$15.00 or more annually. Eighteen percent of the total indicated they are willing to pay \$20 with the mean of the total sample being \$38.57 and the median \$20.00, or a total of \$1.67 monthly. The majority of respondents fall into the payment category ranging from \$15.00 to \$24.99 per year with the average of the of the middle 50% of the response spread indicating a WTP of \$24.39 per year or \$2.03 additional monthly on average.

A full descriptive report is available which provides information and program recommendations to EWEB (Parker, Schurr 2019).

Chapter 3: Methods

This research was conducted for two reasons: (1) to provide information to EWEB about ratepayer program support, preferred fund collection methods, and WTP, and (2) to determine what factors affect WTP. Analysis regarding ratepayer program support and associated fund collection and WTP is reported on in the 2018 Ratepayer Survey Report (Parker, Schurr 2019). Analysis of factors effecting WTP is reported below.

Research Questions

Previous research has shown that place attachment and value have a significant positive influence on WTP (Nielsen-Pincus et al. 2017). I expect this to still be the case. This research will address:

What other factors effect WTP among the EWEB ratepayer population in the city of Eugene, OR?

Secondary questions include:

4. How does the perception of climate change and wildfire as a threat influence WTP?
5. How do levels of institutional trust and program related communication influence WTP?
6. How do perceptions of collaborations influence WTP?

I hypothesize that climate change and wildfire will both have a positive association with WTP. Wildfire will have a larger effect regardless of controls. Climate change will be a greater concern when related to higher education levels and lower age groups. Increasing levels of institutional trust will be positively associated with WTP. Ratepayers who value programmatic communication will be more WTP and those that have a favorable opinion of collaborative programs within the watershed will be more WTP.

Methods

To test the hypotheses, I created four binary logit models exploring the influence of different respondent characteristic and preferences on WTP. All models include data taken from the 2018 Ratepayer Survey. Each model was constructed with a dichotomous (yes/no) WTP dependent variable created from maximum payment preference responses. Responses of \$13.32 (current average collection) or above were coded as yes WTP, amounts below \$13.32 were coded as not WTP. Model 1 measured the effect of threat perception, Model 2 the effect of feelings of institutional trust and communication, Model 3 the effect of feelings associated with collaboration, and Model 4 an all variable model. Models were constructed as follows:

$$Y = \ln\left(\frac{p}{1-p}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k$$

Y is equal to the log odds of an individual being willing to pay in additional amounts for DWSP programs given the sum of the effects of the predictor (independent) variables and the coefficient constant (intercept), $\sum(\beta_0 + \beta_k X_k)$.

Demographic traits with a bivariate statistically significant relationship to WTP were included as controls in all models as well as place and resource valuation related metrics. All models contained the same controls.

Analysis was conducted using IBM® SPSS® Statistics Version 25.

Variable Coding

For each model, all ordinal variables were coded on an increasing scale. For values such as age, income, and education lower numerical values or attainment levels received a lower code value beginning at 1 with each step demarked by an increase in one numerical integer value; i.e. for age a code value of 1=18 to 24, 2=25 to 34, etc. Dichotomous variables such as *Resource Awareness* used binary coding: 0,1, with 0=no and 1=yes. For agreement level questions scales started at 1 and increase by one integer value with level of agreement, and for valuation questions a higher code value indicates a higher value is placed on the subject in question. Ordinal variables, with a value range of either 1 to 5 or 1 to 7 depending on format, were treated as scale (continuous) variables for the purpose of analysis. One unit of increase in the variable scale corresponds to one unit increase in the question response scale.

Sample Weighting and Variable Selection

To account for the most prominent sampling differences with the Eugene population and the effects of potential response bias, sampling weights were calculated for age, income, and education. Each was found to have a significant bivariate association with WTP. I excluded race and ethnic identity from the control group due to limited racial/ethnic variation within the sample. The survey response under-sampled all non-white identities within the City of Eugene though the degree of which does not affect results. Additionally, the *Prefer Not to Identify* category is not included in ACS Census data meaning weighting would lead to misattribution of identity information for some respondents. Voter registration was also excluded as over 95% of the sample indicated that they were registered to vote. The small response rate for the non-white and non-voter population coupled with the lack of available data and small overall population densities for under-sampled identities make it unlikely that any meaningful information could be gained from weighting for these factors. **Table 4** details demographic variable weights. **Table 5** details all included non-demographic variables by model.

Table 4. Survey Response by Age Category, Eugene Population, and Weighted Response

Age	Response	% Survey Respondents	% Eugene Population	Weight Factor	Weighted Response
18-24	10	1%	19%	13.300	133
25-34	66	9%	14%	1.530	101
35-44	100	14%	12%	0.830	83
45-54	112	16%	11%	0.670	75
55-64	152	22%	12%	0.533	81
65+	263	37%	15%	0.399	105
Total	703	100%	82%	x	703
Educational Attainment					
Less than High School Graduate	6	1%	7%	7.627	46
High School Graduate (or Equivalency)	59	8%	18%	2.145	127
Some College or Associate Degree	207	29%	41%	1.407	291
Bachelors Degree	217	31%	20%	0.661	143
Graduate Degree or Higher	215	31%	14%	0.451	97
Total	704	100%	100%	x	704
Income Category					
<\$25,000	81	12%	29%	2.442	198
\$25-\$50k	149	22%	23%	1.039	155
\$50-\$74k	156	23%	17%	0.755	118
\$75-\$149	197	29%	22%	0.745	147
\$150+k	91	14%	8%	0.622	57
Total	674	100%	100%	x	674

Source 2018 Ratepayer Survey. American Community Survey 2013-2017 Table S0101, DP03, S1501

Other independent control variables included in all models were responses to the following questions measuring place and resource value:

- “Do you know your drinking water comes from the McKenzie River?”
 - abbreviated as: *Resource Awareness*
- “In the past year, how often did you visit the McKenzie River Watershed?”
 - abbreviated as: *Place Visitation*
- “How much does the McKenzie River Watershed enhance your quality of life?”
 - abbreviated as: *Place Quality of Life*
- “How important is the quality of drinking water from the McKenzie to you?”
 - abbreviated as: *Resource Importance*

Table 5. Independent Predictor Variables Included by Model

Model Variables	Corresponding Survey Question Number*	Model 1 Threats	Model 2 Trust and Communication	Model 3 Collaboration	Model 4 All Variables
Climate Change is a Threat	Q7	x			x
Wildfire is a Threat	Q7	x			x
EWEB Should Partner with Land Managers	Q7			x	x
EWEB Should Partner with Nonprofits	Q7			x	x
EWEB Should Partner with State and Federal Agencies	Q7			x	x
EWEB Should Partner with Private Landowners	Q7			x	x
Federal Agency Trust	Q8		x		x
State Agency Trust	Q8		x		x
Local Government Trust	Q8		x		x
EWEB Trust	Q8		x		x
Private Land owner Trust	Q8		x		x
Local Nonprofit Trust	Q8		x		x
National Nonprofit Trust	Q8		x		x
Regular Communication Value	Q9		x		x
Feeling informed about programs	Q10		x		x
Government Agency Collaboration Trust	Q10		x	x	x
Government Nonprofit Collaboration Trust	Q10		x	x	x
Feelings about Collaboration and Partnership Outcomes	Q10			x	x

*See Appendix A for full survey instrument and question text

I ran each model in four iterations; unweighted, and for each of the three weighted demographic control factors. Model strengths were compared using the Nagelkerke pseudo r^2 . The pseudo r^2 provided by the Nagelkerke value, one of the common SPSS outputs for binary logit regression, provides information on how well the model accounts for variability among the outcomes over the null and by extension its quality as a predictive tool (Greene 2012). Models with higher Nagelkerke values are assumed to be more predictive of WTP.

In all models the *Age Weighted* iteration produced the highest r^2 indicating the best performance and the best predicative value. *Model 4 All Variables* was the best performing model overall and gives the best picture of the effects of the selected variables on WTP. Other models targeting select variable sets had lower performance but still provide insight into the effects of individual variable categories on WTP and are reported on in **Appendix A**. *Model 4 All Variables Age Weighted* results are reported below and are referred to as the *Target Model* unless otherwise noted.

There is an important limitation to note with both the age and income weighted sample results. The City of Eugene has a large student population. This influences both the lower age and lower income population groups, and to a smaller extent the *Some College or Associate Degree* education category. It is unclear how many students, those typically in the 18-24 age group, are not utility rate payers and as such may not have received the survey. This is less of a concern for the income weight but should be noted. These factors may have influence on results; however, it is most likely small and hard to determine with available information.

Chapter 4: Results

Effect of Control Variables in Model Iterations

Of the control variables *Place Quality of Life*, representing how much a respondent feels the McKenzie River Watershed contributes to their quality of life, is the most consistent predictor of WTP. It has a positive statistically significant association to WTP in all models and model iterations. By contrast only one of the demographic variables achieved statistical significance in the target model: *Educational attainment*. Educational attainment is positively associated with WTP, but this is only true in the *Age* weighted iteration. When the effects of weighting are considered; weighting for age increases the expected number of younger individuals and reduces older; this suggests that in an age representative sample, more educated individuals are more likely to be WTP given the other model variables are held constant but that age and/or income themselves are not a good predictor of WTP when other factors are present.

While *Place Quality of Life* appears to be independent of other variables as a predictor of WTP other place-related controls are not. *Place Visitation* has a positive association in *Education Weighted* model iterations only, suggesting that education levels and visitation are connected and that higher visitation rates are associated with higher WTP. Because the effect of weighting for education increases the number of less educated individuals and decreases those in the upper education brackets in the sample, it appears that visitation increases place connection among those with lower levels of education. There are no other statistically significant control variables, i.e., income, age, resource importance, in any other model iteration.

Target Model Summary

Model 4 All Variables Age Weighted (Table 6) proves to be the most predictive with an r^2 of 0.451. It shows that when controlled for the select demographics and place/resource valuation variables certain collaborative arrangements and trust metrics have a statistically significant, positive or negative, association with WTP. Other variables (outside of the controls discussed above) either have no, or limited, predictive value.

Table 6. Model 4 All Variables by Weight Iteration

Variable	Unweighted			Age Weighted			Income Weighted			Education Weight		
	Coefficient	Exp(B)	Sig	Coefficient	Exp(B)	Sig	Coefficient	Exp(B)	Sig	Coefficient	Exp(B)	Sig
Education	0.309	1.362	NS	0.600	1.823	**	0.281	1.325	NS	0.125	1.133	NS
Age	-0.065	0.937	NS	-0.209	0.812	NS	-0.083	0.920	NS	0.009	1.009	NS
Income	0.165	1.179	NS	-0.115	0.892	NS	0.131	1.140	NS	0.234	1.264	NS
Place Visitation	0.264	1.302	NS	0.111	1.118	NS	0.263	1.301	NS	0.338	1.403	*
Place Quality of Life	0.358	1.431	*	0.513	1.671	**	0.516	1.675	**	0.466	1.594	**
Resource Importance	-0.325	0.723	NS	0.160	1.173	NS	-0.149	0.861	NS	-0.540	0.583	NS
Resource Awareness(1)	-0.102	0.903	NS	0.316	1.371	NS	0.018	1.018	NS	0.184	1.202	NS
Climate Change is a Threat	0.201	1.223	NS	0.222	1.248	NS	0.231	1.260	NS	0.315	1.371	NS
Wildfire is a Threat	0.046	1.047	NS	-0.185	0.831	NS	0.176	1.192	NS	0.044	1.045	NS
EWEB Should Partner with Land Managers	-0.534	0.586	*	-0.777	0.460	*	-0.344	0.709	NS	-0.524	0.592	*
EWEB Should Partner with Nonprofits	0.187	1.205	NS	-0.305	0.737	NS	0.009	1.009	NS	0.235	1.265	NS
EWEB Should Partner with State and Federal Agencies	0.087	1.091	NS	0.417	1.518	NS	0.058	1.060	NS	0.023	1.024	NS
EWEB Should Partner with Private Landowners	0.533	1.704	*	1.143	3.135	**	0.693	1.999	**	0.847	2.332	**
Federal Agency Trust	-0.208	0.812	NS	0.093	1.097	NS	-0.200	0.819	NS	-0.449	0.638	NS
State Agency Trust	-0.481	0.618	NS	-0.138	0.871	NS	-0.709	0.492	*	-0.629	0.533	*
Local Government Trust	0.463	1.589	NS	-0.170	0.844	NS	0.601	1.824	*	0.560	1.751	*
EWEB Trust	0.283	1.327	NS	0.310	1.364	NS	0.234	1.264	NS	0.193	1.212	NS
Private Land owner Trust	-0.043	0.958	NS	-0.098	0.907	NS	-0.023	0.977	NS	0.059	1.061	NS
Local Nonprofit Trust	-0.025	0.975	NS	0.529	1.697	NS	0.132	1.141	NS	0.042	1.043	NS
National Nonprofit Trust	-0.002	0.998	NS	-0.403	0.668	NS	-0.051	0.951	NS	0.171	1.186	NS
Regular Communication Value	0.066	1.068	NS	0.168	1.183	NS	-0.020	0.980	NS	0.046	1.047	NS
Feeling Informed about Programs	0.046	1.047	NS	-0.631	0.532	NS	-0.218	0.804	NS	-0.159	0.853	NS
Government Agency Collaboration Trust	0.575	1.777	*	0.695	2.004	*	0.607	1.835	*	0.776	2.173	**
Government Nonprofit Collaboration Trust	-0.263	0.769	NS	0.190	1.209	NS	-0.322	0.725	NS	-0.522	0.593	NS
Feelings about Collaboration and Partnership Outcomes	-0.146	0.864	NS	-1.062	0.346	**	-0.166	0.847	NS	-0.273	0.761	NS
Constant	-2.608	0.074	NS	-1.050	0.350	NS	-3.235	0.039	NS	-1.859	0.156	NS
Nagelkerke R Square	0.242			0.451			0.319			0.347		

*p<0.05 **p<0.01 NS-Not Significant at the 95% CI

Belief that *EWEB Should Partner with Private Landowners* is positively associated with WTP, as is *Government Agency Collaboration Trust*. This shows that a WTP in additional amounts is associated with increasing levels of trust and positive feelings about collaboration in certain instances. In the case of *Government Agency Collaboration Trust* this means that as feelings of trust in nonspecific government agency collaboration increase the likelihood of an individual being WTP also increases. For each unit of increase in trust the natural log of the odds that a respondent is WTP represented by the coefficient β increase by 0.695 other variables held constant. A unit in this instance is level of agreement with the statement; “*I am more likely to trust government agencies when they work together,*” measured on a scale from *Strongly Agree* to *Strongly Disagree*. In other words, with each unit increase in trust a respondent is 2.004 times more likely (shown by the exponentiated β given in **Table 6**) to be WTP. For *EWEB Should Partner with Private Land Owners* as agreement levels increases the likelihood of being WTP increases by 3.135 times per unit using the same agreement scale.

Other variables pertaining to trust and/or collaboration have a negative association with WTP, which translates to a decreasing likelihood of being WTP as agreement levels increase for the statement: *EWEB should partner with Land management Agencies*. This indicates that low levels of trust given to federal and state land management agencies by survey respondents (See **Table 2**) are not mitigated by partnering with EWEB, which was the most trusted institution tested. *Feelings about Collaboration and Partnership Outcomes* also has negative association with WTP. This result is consistent with the results reported in *Model 3* which measured collaboration related variables independently. However, it is only true in the *Age* weighted iterations. This tells me that there is a relationship between introducing more young people into the sample and a negative association given to general collaboration. This may be the result of the opinions of the those captured in the sample being amplified by weighting or it could indicate a general lack of experience or knowledge of collaborative programs among younger individuals.

Taken together, these results indicate that while respondents generally value collaboration (Parker, Schurr 2019), collaboration needs to be more specific or targeted to affect WTP. Results also suggest that general collaboration alone is not enough to increase WTP in this sample. For example, survey respondents rated private land owners as the least trusted group (**Table 2**), but working in collaboration with EWEB (EWEB being the most trusted group) appears to overcome this deficit. This does not hold true universally, as evidenced by the negative association of EWEB/Land Manager collaboration and feelings about collaboration and partnerships producing better outcomes.

Neither of the tested threats *Wildfire is a Threat* or *Climate Change is a Threat*, had a statistically significant association with WTP in the target model. This is counter to my hypothesis, which anticipated that perception of wildfire as a threat would have a positive association regardless of demographics and perception of climate change would be positively associated with WTP as age decreased and education increased (accounted for in the different weight iterations). *Model 1* (see **Appendix A**) which tested threat perception independently does show a positive association to WTP for climate change threat perception indicating there may be a relationship. But the relationship is not borne out when other variables are introduced into the model indicating that other factors have greater influence. It is possible that because wildfire and climate change are highly correlated, and a majority of survey respondents viewed both as a threat, that they were removed from the model in lieu of other factors with more variation. Or they may simply be of less concern in comparison with other variables when it comes to issues of payment.

Chapter 5 Discussion and Conclusions

I set out to determine what factors effect WTP for DWSP among a sample of public utility ratepayers in Eugene, Oregon. I specifically wanted to know how climate change and wildfire threat perception, feelings of institutional trust, programmatic communication, and feelings about collaboration influenced WTP. I expected there to be some demographic effects and, due to previous research in the survey area (Nielsen-Pincus et al. 2017), effects associated with place relationships and valuations. I hypothesized that wildfire would be a larger predictor of WTP regardless of demographics and that climate change would only be a factor when age and education were considered. I thought that higher levels of institutional trust and positive feelings about programmatic communications would lead to higher levels of WTP. Finally, I anticipated that positive feelings associated with collaborative programs would lead to greater WTP in the sample.

It turns out that the results were a bit of a mixed bag and painted a more complicated picture of WTP. My hypothesis was partially confirmed in some respects by the target model; trust in certain combinations of institutions and collaboration did increase the likelihood of a respondent being WTP. However, communication, when tested against all other variables, had no effect on WTP, nor did perception of climate change or wildfire as a threat to the watershed. Given recent fire activity in the McKenzie River Basin in 2017 and 2018, this last result is surprising. This may be the result of distance from the actual geographic extent of the watershed, or a disconnected relationship between water ratepaying households and those actually living within its bounds who are more directly affected by fire events.

Study of forest surface water systems in New Mexico has shown that distance from the resource does play a role in WTP but as perception of risk increases WTP also tends to increase (Adhikari et al. 2007). Given that Eugene is located in the temperate western Pacific Northwest and the survey was conducted in November and December, two of the wetter months of the year, I am left wondering: if this study had been conducted in the drier summer months or closer in time to a fire event would the results have been different? Additionally, had the survey included those living within the geographic bounds of the watershed, an area at greater risk of catastrophic fire, would that have influenced the results? Based on the available literature, I would posit that they would. The literature supports this, showing that when ratepayers are able to make direct connections between risk and the resource, or a threat event to effects on resource delivery, WTP tends to be higher if payment is seen as a means for mitigating the risk (Obeng, Aguilar, Xavier. 2017. Hensher, Shore, Train 2005). Furthermore, making the connection between wildfire and water quality requires an understanding of watershed and hydrologic systems that may not be prevalent within the sample population. Absent direct and measurable impacts, such as sediment load from recent burn area run off, making a connection between fire in the upper watershed and downstream effects may be difficult for some.

Trust in individual institutions had no effect one way or another on WTP and only emerged as a predictor when it was related to a collaborative relationship regardless of trust assessment given by survey respondents. Interestingly, trust in non-specific government agency collaboration was a positive predictor of WTP. This tells me that the act of combining public services or working together at various levels of governance is viewed positively by this population. This supports research that shows that the simple act of sharing administrative resources builds relationships between public agencies and by extension improves public perception of those agencies among the populations they serve (Polychou, Evangelinos, Halvadakis 2010). This extends to water service providers particularly when faced with scarcity or threat to supply (Hensher, Shore, Train 2005. Bendz, Boholm 2018). In this case collaboration with EWEB enabled private land owners as a group to overcome a high level of distrust leading to a positive association with WTP. This means that ratepayers, en masse, are supportive of WTP for programs involving payment to, or work with, private land owners as long as EWEB leads and benefits to the watershed are achieved. This same increase in trust was not extended to an EWEB partnership with Land Managers.

State and Federal natural resource management agencies were the sixth and fourth least trusted entities of the seven tested. While partnering with state and federal agencies proved to not be a significant predictor, partnering with land managers had a negative association with WTP. This indicates that respondents are relating land managers with federal and state agencies, and perhaps, to an extent, some local government agencies that receive low trust ratings. Unlike private land owners these entities were unable to overcome their low trust rankings by working with EWEB despite general support for the partnership given in the survey response (Parker, Schurr 2019). In this case it becomes incumbent upon the agencies and organizations in any process to understand the public opinion associated with those involved. When possible the more trusted entity should take the lead when it comes to communication or implementation design. Curiously, when the sample was weighted for age, general feelings that collaboration and partnerships produce better outcomes was a negative predictor of WTP. This deserves more dedicated research. As posited in the results discussion above perhaps this is due to the amplification of a discrete number of respondents as a result of weighting. It is also possible that younger individuals may not have had experience with collaborative programs to a degree that would allow them to form positive perceptions of the potential benefits of collaboration. Or, when faced with a hypothetical of two or more large, presumable well-funded, entities working together justification for additional payment from ratepayers is a harder sell. In the face of other results supporting collaborative working arrangements in relation to WTP for PES, a dedicated study focused on collaboration and age demographics is warranted.

When the different models are considered, a slightly more nuanced picture emerges (see **Appendix A** for additional model results). *Model 1* shows that concern over climate change has a greater relationship to WTP than wildfire which was not significant, indicating that when isolated, larger existential threats are relevant to conversation surrounding PES programs. However as discussed above this may be a result of both temporal relationships to recent events and also geographic distance from the resource in question. That being said these

results, both the target model and *Model 1*, indicate that climate change no longer need be relegated to third-rail status in messaging and communication campaigns. Being both a significant positive predictor of WTP when isolated and non-significant aspect when controlled by other factors confirms what others have found: public attitudes are changing in the face of both local and global events and acceptance of climate change as a phenomenon is more widespread (Davidson, Stedman 2018). Furthermore, given the large majority of respondents who indicated that climate change is viewed as a threat to the watershed, it should be integrated into programmatic models without concern of political backlash.

Model 2 and *Model 3* are largely congruent with the target model outcomes, however some interesting things become apparent when certain variables were tested in thematic isolation, i.e., alongside variables of a similar theme. Feelings of being informed, a measure of the importance of programmatic communication, was a negative predictor of WTP. This translates to respondents being less WTP as positive feelings about being informed about programs increase. This is counter intuitive but when viewed alongside the survey results it is a consistent result. Respondents indicated that they only moderately valued regular communications. This shows that in our connected and stimulation inundated world, that over communication can have a chilling effect on program support and thus program funding.³ Keeping communications to a “need to know” format, informing ratepayers about important program actions or changes, rather than a regular stream of information may be more effective in building program support.

Weighting for education also produced some interesting results. On the whole education weighted results were similar and generally in agreement with the target model and other model age weighted results. The most striking difference was that frequency of visitation to the watershed became significant in each of the education weighted model iterations, joining place value as a positive predictor of WTP. Other differences included; trust in local government gains a positive association, and feelings about collaboration and partnerships loses its significance and negative association with WTP. These results indicate that for individuals with low or moderate levels of education visiting the watershed increases its value, thus building a better relationship and increased WTP, and that this group does not share negative feelings of collaboration held by younger individuals in the age weighted iteration.

Throughout all models and model iterations one factor had a larger determining effect than the others: *Place Quality of Life*. This supports previous research in the survey area (Nielsen-Pincus et al. 2017) and also more generally applicable research connecting place attachment to environmentally responsible behavior (Vaske, Kobrin 2001). Boiled down, people are more likely to care about and care for, either through direct behaviors or financial/generalized support, resources they have a connection to. This is makes intuitive sense. It then becomes

³ Guidestar, a leading nonprofit information service provider, recommends that fundraising and program support communications be targeted and engaging and that too many contacts may lead to less response. Most people receive more mail or e-mail marketing and communications than they are able to process. Once this threshold is reached engagement is less likely than it would otherwise be with fewer more target outreach attempts. <https://trust.guidestar.org/topic/fundraising-communications>

the responsibility of resource agencies to eschew purely incentive or emotion-based outreach and communication strategies in exchange for efforts that strive to build on existing place attachment and value. Or, in the absence of such relationships, to look for ways to build them.

Conclusions

The contribution of the McKenzie River Watershed to quality of life (place value and relationships) has proven to be the most consistent and important predictor of WTP. Across all models, there was little to no variation in significance level or association. It was constantly positive regardless of weighting or other variable controls. Larger institutions were generally less trusted than smaller, with the exception similar levels of trust given to Local and State level government, and local institutions such as EWEB or local Nonprofit Organizations were the most trusted. However, trust levels were not associated with WTP unless measured in relationship to collaborative arrangements with differing results. Communication, in any of the forms tested, was not associated with WTP in the target model and only negatively when tested in *Model 2*. This leads me to conclude that communication is simply not a predicting factor, and as mentioned collaboration is only associated with WTP as a positive predictor when associated with specific arrangements but can also act as a negative predictor of WTP given certain circumstances.

It is important to note that these data were collected by sampling EWEB ratepaying households within the bounds of Eugene, OR only. Eugene, home to a large public university and a relatively politically liberal and educated populous, is somewhat unique. Regardless, certain aspects of the findings such as: place value is a positive predictor of WTP, trust varies across institutions and arrangements, and that not all communication is good for building effective programs, can inform other public utilities looking to establish similar PES systems.

An additional limitation is found in my chosen analysis framework. For ease of analysis I chose to use a binary model. However, while a binary model was sufficient for determining how my selected variables effect WTP when controlled for each other and in thematic isolation (accounted for by the model and weight variations) it does not provide a robust profile of ratepayer payment preference or do well in determining marginal, combined, or confounding effects. The development of a modified linear model using the entire range of preferred WTP amounts, a multinomial logit model using the natural quintile break points of the distribution of payment amounts to form a categorical dependent variable, or a stepwise model to determine best model fit may be a more appropriate analysis approach and yield more robust results.

Further Research

Like most research, this study led to more questions than it did answers. While I was able to determine what factors influenced WTP in this sample, more exploration is warranted. In the future, additional research should focus on specific climate change and threat perception

variables to determine where the division between existential threat perception and proximity to an actual threat intersect. This will allow PES program designers to better understand the dynamics of threat and risk perception and mitigation and how they affect attitudes about the need to regulate behavior or participate in protection efforts. Focusing specifically on immediate proximity, in this case residence within the bounds of the watershed, vs. remote proximity (Eugene residents) can shed light on how to build better relationships and understanding of the delivered drinking water resource and its source in a threat response context.

More targeted research involving collaborative programs and multijurisdictional resource protection is of equal if not greater importance. The McKenzie River Watershed, like most surface water utility systems, is a mix of both public and private ownership. Any action intended to protect or conserve resources within the system requires coordination and collaboration between agencies, owners, and any number of other stakeholders. Collaboration is necessary for functional resource stewardship meaning that supporting it via funding or participation is important and means of increasing support is necessary. This need bleeds into issues of institutional trust. My research has shown that trust is complicated. Trust in individual institutions was not a significant predictor of WTP in this instance but trust in combinations of institutions was, both positive and negative dependent on those involved. Research should be done into what influences institutional trust in terms of PES systems and public resources. This would serve two purposes; building on current literature into institutional trust and building a specific branch of literature into how institutional trust and PES systems interact.

To extend the applicability of these findings, I suggest using the 2012 Ratepayer Survey results and those of the 2018 Ratepayer Survey to form the beginnings of a panel dataset within the EWEB service area. Future survey and outreach efforts should focus on key questions and metrics collected by both surveys to track changes. Of particular interest would be changing program awareness, place and resource value and relationships, and levels of institutional and collaborative trust as programs are implemented and evolve. These results should then be compared to similar study in other public utility ratepaying populations in similar contexts (surface water systems, multijurisdictional management, etc.) to determine larger trends. This would help to inform PES program best practices outside of limited geographic regional context.

Recommendations to EWEB

This study was born from a need to inform an expansion of PES programs within the McKenzie River Watershed. At its core, both in survey response and through statistical analysis, it has done that. The 2018 Ratepayer Survey Report provides a full suite of program and policy recommendations (Parker, Schurr 2019). Recommendations offered here do not differ substantially from those offered in the survey report, instead they build and compliment them. The primary message that my research carries is: place matters, and relationships to

place are the most important determinants of financial support for its stewardship. With this in mind I recommend:

1. EWEB substantially increase the DWSP budget and while doing so be sure to relate any increase in rate or fee structure to benefits to the environments found in the watershed first and drinking water quality second. In doing so concerns over ratepayer support should be minimal. A large majority indicated support for additional payments. However, in order to build and solidify that support my research suggests that concern of water quality is not the most pressing issue for ratepayers. This means that any communication should relate actions to the place rather than directly to water quality as EWEB seeks ways to build the connection between the two.
2. Communications should be targeted, informative, direct, and relatively infrequent. To maximize impact EWEB should focus future DWSP messaging to only information that informs ratepayers about current actions affecting the watershed and limit regular updates. The goal should be to increase ratepayer knowledge about programs without inundating them with too much information and inducing communication fatigue. As the Pure Water Partner (PWP) program grows efforts should be taken to increase brand awareness and separate PWP communications from other DWSP messaging to avoid confusion.
3. When engaging in, or developing, collaborative programs or projects EWEB should lead the way as much as possible and practical. EWEB was the most trusted institution among those tested. For survey respondents, working with EWEB was enough to overcome significant low trust barriers for some partners. This indicates that communications or program initiatives coming from EWEB will likely be better received than those coming from other entities. This is most relevant when it comes to expansion of the PWP program and efforts in the middle and upper watershed where federal land management has a much larger presence. There may be legal or regulatory barriers that require certain actions to be conducted and messaged by federal or state agencies, (NEPA related public comment for instance); however, any action that will have effect on DWSP efforts or may be related should also be messaged through EWEB channels. EWEB should take efforts to promote and educate their ratepayers about land management actions in the watershed as a way to build understanding and trust in the agencies performing those actions⁴. Any MOU or Intergovernmental Agreements relating to DWSP or PWP programs should reflect the reality of public perception and have built within them communication and outreach provisions taking trust metrics into account.
4. Additional study either through survey or focus group should be conducted into preferred billing and funds collection practices. Question 14 of the 2018 Ratepayer

⁴ This is contingent upon EWEB agreement and support of the management action in question.

Survey (see **Appendix B**) asked respondents to rate their preferred funds collection method. The wording of this question may have been confusing. I recommend that in an effort to secure permanent and transparent funding for DWSP that collection appear as a separate item on the bill and that it be clearly explained next to this charge what the funds are being used for and how they are being assessed. Care needs to be taken to assure ratepayers that collection is not a new charge, but it is the supported DWSP funds being specifically called out from regularly assessed rates. I recommend the text of this question be changed as follows: (Changes appear in bold)

EWEB currently funds the Source Water Protection Program through water rate fees. Water rates are subject to general management and board approval. Funds currently used for the Source Water Protection Program could be directed to other uses. Because maintaining water quality is not directly tied to water consumption, EWEB is considering other options for funding the Source Water Protection Program.

Q14 Currently the monthly amount supporting the Source Water Protection Program varies by the amount of water consumed. The current contribution is \$0.12 per 1,000 gallons (the average household uses 9,000 gallons per month). This equates to an average of \$1.11 per month (or \$13.32 per year) per household. Please indicate which fee structure is most desirable to you.

- *The current program — customers who consume more water should pay more. **Assessed Source Water Protection Funds are included in rates and do not appear as a separate item.***
- *A flat fee assessed on all residential water customers (Appears as a separate line item fee on your monthly bill. **You know exactly how much you pay for Source Water Protection; funds are not additional changes but are called out as a specific Source Water Protection Allocation**)*
- *A flat fee assessed on all (residential and commercial) EWEB water customers (Appears as a separate line item fee on your monthly bill. **You know exactly how much you pay for Source Water Protection; funds are not additional changes but are called out as a specific Source Water Protection Allocation**)*
- *A tiered fee based on size of pipe (users with higher volumes have larger pipes; Appears as a separate line item fee on your monthly bill. **You know exactly how much you pay for Source Water Protection; funds are not additional changes but are called out as a specific Source Water Protection Allocation**)*

5. Most importantly remember that the ratepaying population is not necessarily aware of the connection between actions in the watershed and their drinking water quality or that programs to protect it are in progress. Place-based messaging and outreach efforts should be made to increase program awareness, volunteering opportunities offered and connected to DWSP efforts, and community engagement through school and educational programming considered. Participating in community events and recreation-based stewardship events in the watershed should be encouraged. For example, sponsoring trail work events and then connecting those efforts to enhancing and protecting the place while also protecting water quality and habitat are a means of

active outreach. Current local partners such as the McKenzie River Trust, or other recreation-based interest groups like the Disciples of Dirt Mountain Bike Club, should be engaged for these efforts. Other efforts should be taken to help build trust in low trust institutions through strategic partnership and constant efforts to involve the ratepaying public in activities in the watershed as much as possible.

References

- Adhikari, Dadhi.** Thacher, Jennier A. Chemark, Janie M. Berrens, Robert P. 2017. "Linking Forests to Faucets in a Distant Municipal Area: Public Support for Forest Restoration and Water Security in Albuquerque, New Mexico." Department of Economics, University of New Mexico. *Water Economics and Policy*, Vol. 3, No. 1.
- Bendz, Anna.** Boholm, Asa. 2018. "Drinking water risk management: local government collaboration in West Sweden." *Journal of Risk Research*
<https://doi.org/10.1080/13669877.2018.1485168>
- Carson, Richard T.** Flores, Nicholas E. Meade, Norman F. 2001. "Contingent Valuation: Controversies and Evidence." *Environmental and Resource Economics*. Vol. 19. No. 2. pg. 173-210
- Chatterjee, Chiradip.** Triplett, Russel. Johnson, Christopher K. Ahmed, Parvez. 2017. "Willingness to pay for safe drinking water: A contingent valuation study in Jacksonville, FL." *Journal of Environmental Management* 203. pg. 413-421
- Cáceres, D.,** Tapella, E., Quétier, F., & Díaz, S. 2015. "The social value of biodiversity and ecosystem services from the perspectives of different social actors." *Ecology and Society*, Vol. 20 No. 1
- Davidson, Debra J.** Stedman, Richard C. 2018. "Calling forth the change-makers: Reflexivity theory and climate change attitudes and behaviour." *Acta Sociologica* Vol.61 No. 1 pg.79-94
- Dillman, Don A.** Smyth, Jolene D. Christian, Leah Melani. 2014. "Internet, Phone, Mail, and Mixed-Mode Surveys: The Tailored Design Method." John Wiley & Sons 2014
- Ernstson, H. S.** Sorlin. 2013. "Ecosystem services as technology of globalization: On articulating values in urban nature." *Ecological Economics* Vol. 86. pg. 274-284
- EWEB. Eugene Water & Electric Board.** 2000. "Drinking Water Protection Plan Technical Report." <http://www.eweb.org/community-and-environment/mckenzie-watershed-protection/drinking-water-source-protection-plan>
- EWEB. Eugene Water & Electric Board.** 2017. "Strategic Planning Technical Report Drinking Water Source Protection Program (2018-2028)." <http://www.eweb.org/community-and-environment/mckenzie-watershed-protection/drinking-water-source-protection-plan>
- Greene, W.H.** 2012. "Econometric analysis 7th ed." Upper Saddle River, NJ. Prentice Hall.
- Hansen, Kristiana.** Duke, Esther. Bond, Craig. Purcell, Melanie. Ginger, Paige. 2018. "Rancher Preferences for a Payment for Ecosystem Services Program in Southwestern Wyoming." *Ecological Economics* Vol. 146 pg. 240-249
- Hausman, J.** 2012. "Contingent valuation: from dubious to hopeless." *Journal of Economic Perspectives*. Vol. 26 No. 4. pg. 43-56
- Hensher, David.** Shore, Nina. Train, Kenneth. 2005. "Households' Willingness to Pay for Water Service Attributes" *Environmental and Resource Economics* 32 pg. 509-511
- Jesperon, Kristjan.** Gallemore, Caleb. 2018. "The Institutional Work of Payments for Ecosystem Services: Why the Mundane Should Matter." *Ecological Economics* Vol. 146 pg. 507-519
- Kosoy, Nicolas.** Corbera, Esteve. 2010. "Payments for ecosystem services as commodity

- fetishism." *Ecological Economics* Vol. 69 pg. 1228-1236
- Kosoy, Nicolas.** Martinez-Tuna, Miguel. Muradian, Roldan. Alier, Juan Martinez. 2006. "Payments for environmental services in watersheds: Insight from a comparative study of three cases in Central America." *Ecological Economics* Vol 61. pg. 446-455
- Loomis, John.** 2011. "What's to know about hypothetical bias in stated preference valuation studies?" *Journal of Economic Surveys* Vol. 25. pg. 363-370
- Loomis, John B.** Gonzalez-Caban, Armando. Gregory, Robin. 1996. "A cotingent valuation study of the value of reducing fire hazards to old-growth forests in the Pacific Northwest." Pacific Southwest Reaerch Station, Forest Service, U.S. Department of Agriculture. 24p.
- Mmopelwana, G.** Kgathi, D.L. Masamba, W.R.L. Thukuza, A. 2005. "Household Willingness to Pay for Reliability of Water Supply and Quality in Chobe Suburb of Maun: An Application of the Contingent Valuation Method." *Botswana Notes and Records*, Vol. 37 pg. 97-107
- Murphy, James J.** Stevens, Thomas H. 2016. "Contingent Valuation, Hypothetical Bias, and Experimental Economics." *Agricultural and Resource Economics Review*. Vol. 33. No. 2. pg. 182-192
- Mueller, Julie M.** 2013. "Estimating willingness to pay for watershed restoration in Flagstaff Arizona using dichotomous-choice contingent valuation." *Forestry* Vol. 87. pg. 327-333
- Muradian, R.** Arsel, M. Pellegrini, L. Adaman, F. Aguilar, B. Corbera, E. Ezzine de Blas, D. Farley, J. Forger, G. Garcia-Frapolli, E. Gomez-Baggethun, E. Gowdy, J. Kosoy, N. Le Coq, JF. Leroy, P. May, P. Meral, P. Mibielly, P. Norgaard, R. Ozaynak, B. Pascual, U. Pengue, W. Perez, M. Pesche, D. Pirard, R. Ramos-Martin, J. Rival, L. Saenz, F. Van Hecken, G. Vatn, A. Vira, B. Urama, K. 2013. "Payments for ecosystem services and the fatal attraction of win-win solutions." *Conservation Letters* Vol. 6 No. 4. Pg. 274-279
- Muradian, Roldan.** Corbera, Esteve. Pacual, Unai. Kosoy, Nicolas. May, Pete H. 2010. "Reconciling theory and practice: An alternative conceptual framework for understanding payments for environmental services." *Ecological Economics* Vol. 69 pg. 1202-1208
- Nesbitt, Lorien.** Hotte, Ngaio. Barron, Sara. Cowen, Judith. Sheppard, Steven R.J. 2017. "The social and economic value of cultural ecosystems services provided by urban forest in North America: A review and suggestions for future research." *Urban Forestry & Urban Greening*. Vol. 25, pg. 103-111
- Nielsen-Pincus, Max.** Sussman, Patricia. Bennett, Drew E. Gosnell, Hannah. Parker, Robert. 2017. "The Influence of Place on the Willingness to Pay for Ecosystems Services." *Society and Natural Resources*, Vol. 30 No. 12, pg. 1423-1441
- Obeng, Elizabeth Asantewaa.** Aguilar, Francisco Xavier. 2017. "Value orientation and payment for ecosystem services: Perceived detrimental consequences lead to willingness-to-pay for ecosystem services." *Journal of Environmental Management* Vol. 206 pg. 458-471
- Parker, Robert.** Hickson, Patricia. Lopez, Monique. Lewis, Terry. Steckler, Becky. Rafuse, Steve. Phillips, Madeline. Nielsen-Pincus, Max. Mosley, Cassandra. Lurie, Sue. Duncan, Sally. 2013. "An Evaluation of Utility Ratepayer and Landowner Perceptions of a Payment for Ecosystems Services Program in the McKenzie River Basin." Report by: Community Planning Workshop, Community Service Center, University of Oregon
- Parker, Robert.** Schurr, Andrew. 2019. "Funding Source Water Protection Programs: Results of a

Survey of EWEB Ratepayers.” University of Oregon Institute for Policy Research and Engagement

- Polyzou, E. Jones. Evangelinos, N. Halvadakis, K.I. C.P.** 2010. “Willingness to pay for drinking water improvement and the influence of social capital.” Department of Environment, University of the Aegean. *The Journal of Socio-Economics* Vol. 40 pg. 74-80
- Shandas, Vivek. Messer, Berry.** 2008. “Fostering Green Communities Through Civic Engagement: Community-Based Environmental Stewardship in the Portland Area.” *Journal of the American Planning Association*, Vol. 74 No. 4 pg. 408-418
- Vaske, Jerry J. Kobrin, Katherine C.** 2001. “Place Attachment and Environmentally Responsible Behavior.” *The Journal of Environmental Education*. Vol. 32. No 4 pg. 16-21
- Wan, Calvin. Qiping Shen, Geoffrey. Choi, Stella.** 2017. “A review on political factors influencing public support for urban environmental policy.” *Environmental Science and Policy*. Vol. 75 pg. 70-80

Appendix A: Additional Models

Other Factors Influencing WTP in the Model Iterations

Model 1, (see **Table A1**) which tested threat perception independently, shows a positive association between WTP and climate change threat perception. In this model an individual is more likely to be WTP as their perception of climate change as a threat increases. Similar results are shown in the education weighted model. Slight variation in control variables are seen between iterations as well. In the *Education* iteration, the place control variable of *Resource Importance*, which measures how much respondents value water quality from the McKenzie River, takes on a negative association versus the target model where it has no significant relationship. This may indicate that for lower or moderately educated individuals, accounting for the effects of weighting, that water quality specific to the McKenzie is a less important predictor of WTP than positive contributions to quality of life. It could also reflect the disconnect between the watershed (the source of the drinking water resource) and the actual water flowing from a household tap.

Table A1. Model 1: Threat Perception by Weighted Control Category

Variable	Unweighted			Age Weighted			Income Weighted			Education Weight		
	Coefficient	Exp(B)	Sig	Coefficient	Exp(B)	Sig	Coefficient	Exp(B)	Sig	Coefficient	Exp(B)	Sig
Education	0.353	1.423	*	0.148	1.159	NS	0.288	1.333	NS	0.072	1.074	NS
Age	0.052	1.053	NS	0.082	1.085	NS	0.029	1.030	NS	0.074	1.077	NS
Income	0.182	1.200	NS	0.122	1.129	NS	0.190	1.209	NS	0.243	1.275	NS
Place Visitation	0.263	1.301	NS	0.169	1.184	NS	0.250	1.284	NS	0.274	1.315	*
Place Quality of Life	0.390	1.477	**	0.379	1.461	**	0.540	1.716	**	0.530	1.699	**
Resource Importance	-0.213	0.808	NS	0.661	1.936	**	-0.097	0.907	NS	-0.518	0.596	*
Resource Awareness(1)	-0.081	0.923	NS	-0.051	0.950	NS	-0.118	0.889	NS	-0.029	0.971	NS
Climate Change is a Threat	0.364	1.439	*	0.411	1.508	*	0.316	1.371	NS	0.387	1.472	**
Wildfire is a Threat	0.016	1.016	NS	-0.285	0.752	NS	0.134	1.143	NS	0.166	1.181	NS
Constant	-2.467	0.085	NS	-4.516	0.011	**	-3.443	0.032	**	-1.563	0.210	NS
Nagelkerke R Square			0.160			0.232			0.224			0.209

* $p < 0.05$ ** $p < 0.01$ NS-Not Significant at the 95% CI

Model 2 (see **Table A2**) tested institutional trust and communication. *Place Quality of Life* again proves to be the most consistent predictor across all iterations. Non-specific *Government Agency Collaboration Trust* is also positively associated with WTP in all models, indication that regardless of trust given to individual agencies trust increases when they work together. In both the *Education* and *Income* iteration *State Agency Trust* has a negative association with WTP and *Local Government Trust* is positively associated with WTP. This shows that while state agencies receive low trust ratings by the sample population, increasing trust is not associated with higher WTP. Conversely, increasing levels of trust in local government is associated with higher WTP despite receiving a slightly lower trust ranking than state agencies. This indicates that individuals in this population would prefer to keep their money local and have a closer relationship to their local communities rather than larger entities. *Federal Agency Trust* has a negative association with WTP when the model is weighted for *Education*. This reflect a similar trend as *State Agency Trust* and also reflects survey results (**Table 2**). *Feeling Informed about Programs* is negatively associated with WTP in the *Age* weighted iteration only. This reflects a moderately positive feeling given to regular program communication in the survey results and indicates that too much communication is associated with diminishing support.

Table A2. Model 2 Institutional Trust and Communication by Weighted Control Category

Variable	Unweighted			Age Weighted			Income Weighted			Education Weight		
	Coefficient	Exp(B)	Sig	Coefficient	Exp(B)	Sig	Coefficient	Exp(B)	Sig	Coefficient	Exp(B)	Sig
Education	0.290	1.336	NS	0.267	1.307	NS	0.237	1.267	NS	0.053	1.054	NS
Age	-0.001	0.999	NS	-0.051	0.950	NS	-0.002	0.998	NS	0.063	1.065	NS
Income	0.157	1.170	NS	-0.027	0.973	NS	0.147	1.158	NS	0.210	1.234	NS
Place Visitation	0.239	1.271	NS	0.128	1.136	NS	0.245	1.278	NS	0.286	1.331	*
Place Quality of Life	0.401	1.493	**	0.474	1.606	**	0.580	1.785	**	0.558	1.747	**
Resource Importance	-0.271	0.762	NS	0.251	1.285	NS	-0.080	0.923	NS	-0.417	0.659	NS
Resource Awareness(1)	0.015	1.015	NS	0.007	1.007	NS	0.088	1.092	NS	0.228	1.256	NS
Federal Agency Trust	-0.263	0.769	NS	0.232	1.262	NS	-0.253	0.776	NS	-0.525	0.592	*
State Agency Trust	-0.501	0.606	NS	-0.135	0.874	NS	-0.712	0.491	*	-0.640	0.527	*
Local Government Trust	0.500	1.648	NS	-0.506	0.603	NS	0.555	1.742	*	0.594	1.811	*
EWEB Trust	0.284	1.328	NS	0.272	1.312	NS	0.231	1.260	NS	0.146	1.157	NS
Private Land owner Trust	-0.129	0.879	NS	-0.179	0.836	NS	-0.050	0.951	NS	-0.041	0.960	NS
Local Nonprofit Trust	0.053	1.054	NS	0.537	1.710	NS	0.252	1.287	NS	0.123	1.131	NS
National Nonprofit Trust	0.112	1.118	NS	-0.182	0.833	NS	-0.029	0.972	NS	0.344	1.411	NS
Regular Communication Value	0.049	1.050	NS	0.069	1.071	NS	-0.019	0.981	NS	-0.003	0.997	NS
Feeling Informed about Programs	0.016	1.016	NS	-0.883	0.413	**	-0.174	0.840	NS	-0.144	0.866	NS
Government Agency Collaboration Trust	0.508	1.662	*	0.715	2.044	**	0.574	1.776	*	0.672	1.958	**
Government Nonprofit Collaboration Trust	-0.073	0.930	NS	0.153	1.166	NS	-0.085	0.918	NS	-0.251	0.778	NS
Constant	-2.248	0.106	NS	-1.669	0.188	NS	-2.434	0.088	NS	-0.682	0.505	NS
Nagelkerke R Square			0.199			0.333			0.268			0.268

*p<0.05 **p<0.01 NS-Not Significant at the 95% CI

Model 3 (see **Table A3**) tested how collaboration perceptions are associated with WTP. The *Age* iteration results match those of the target model. *Model 3* shows the least variation between *Education* and *Age* iterations of the models generally. *Feelings about Collaboration and Partnership Outcomes* which has a negative association in *Age* has no significant relationship in *Education* and there is a stronger negative association with *EWEB Should Partner with Land Managers* in *Education* than in *Age*. Other differences are present primarily in the effects of the control variables. The *Income* iteration for *Model 3* has only one significant non-control predictor, *EWEB Should Partner with Private Land Owners*, which is positively associated with WTP which is true across all iterations.

Table A3. Model 3 Collaboration by Weighted Control Variable

Variable	Unweighted			Age Weighted			Income Weighted			Education Weight		
	Coefficient	Exp(B)	Sig	Coefficient	Exp(B)	Sig	Coefficient	Exp(B)	Sig	Coefficient	Exp(B)	Sig
Education	0.337	1.401	*	0.559	1.749	**	0.311	1.365	NS	0.083	1.086	NS
Age	-0.026	0.975	NS	-0.141	0.868	NS	-0.047	0.954	NS	0.005	1.006	NS
Income	0.119	1.126	NS	-0.113	0.893	NS	0.129	1.137	NS	0.203	1.225	NS
Place Visitation	0.247	1.280	NS	0.148	1.159	NS	0.231	1.260	NS	0.295	1.343	*
Place Quality of Life	0.410	1.506	**	0.544	1.723	**	0.576	1.779	**	0.525	1.691	**
Resource Importance	-0.368	0.692	NS	0.259	1.295	NS	-0.166	0.847	NS	-0.601	0.548	*
Resource Awareness(1)	-0.165	0.848	NS	0.152	1.164	NS	-0.066	0.936	NS	-0.016	0.984	NS
Government Agency Collaboration Trust	0.473	1.605	*	0.691	1.997	**	0.456	1.578	NS	0.564	1.758	**
Government Nonprofit Collaboration Trust	-0.201	0.818	NS	0.244	1.276	NS	-0.154	0.857	NS	-0.363	0.696	NS
Feelings about Collaboration and Partnership Outcomes	-0.105	0.901	NS	-1.304	0.272	**	-0.299	0.741	NS	-0.290	0.748	NS
EWEB Should Partner with Land Managers	-0.501	0.606	*	-0.748	0.473	*	-0.338	0.713	NS	-0.598	0.550	**
EWEB Should Partner with Nonprofits	0.256	1.291	NS	-0.249	0.780	NS	0.110	1.117	NS	0.393	1.481	NS
EWEB Should Partner with State and Federal Agencies	0.201	1.223	NS	0.464	1.591	NS	0.179	1.196	NS	0.139	1.149	NS
EWEB Should Partner with Private Landowners	0.449	1.566	*	0.913	2.492	**	0.577	1.782	**	0.747	2.111	**
Constant	-1.760	0.172	NS	-1.753	0.173	NS	-2.917	0.054	NS	-0.741	0.477	NS
Nagelkerke R Square	0.199			0.411			0.257			0.272		

*p<0.05 **p<0.01 NS-Not Significant at the 95% CI

Appendix B. Survey Instrument

EWEB Source Water Protection Ratepayer Survey

This survey should take you about 10 to 15 minutes to complete. As an incentive, we will randomly select four participants to win \$50 gift cards. To enter to win, provide your contact information at the end of the survey. Your contact information will not be connected to your answers. You do not have to complete the survey to enter the raffle.

This survey was developed by the University of Oregon's Institute for Policy Research and Engagement (IPRE) in partnership with the University of Oregon and funded through the Eugene Water & Electric Board (EWEB) by a Healthy Watersheds Grant from the U.S. Endowment for Forestry and Communities.

Your answers are and will be completely confidential. Any personally identifying information will not be tied to any product this research produces. We will not share or sell your personally identifying information. By completing and returning this survey you provide consent in allowing the IPRE to use these findings for research. You may choose not to participate in this survey without penalty. If you have any questions, please contact Robert Parker, IPRE Director (541.346.3801 or rgp@uoregon.edu).

Survey Number (Top of Survey) _____

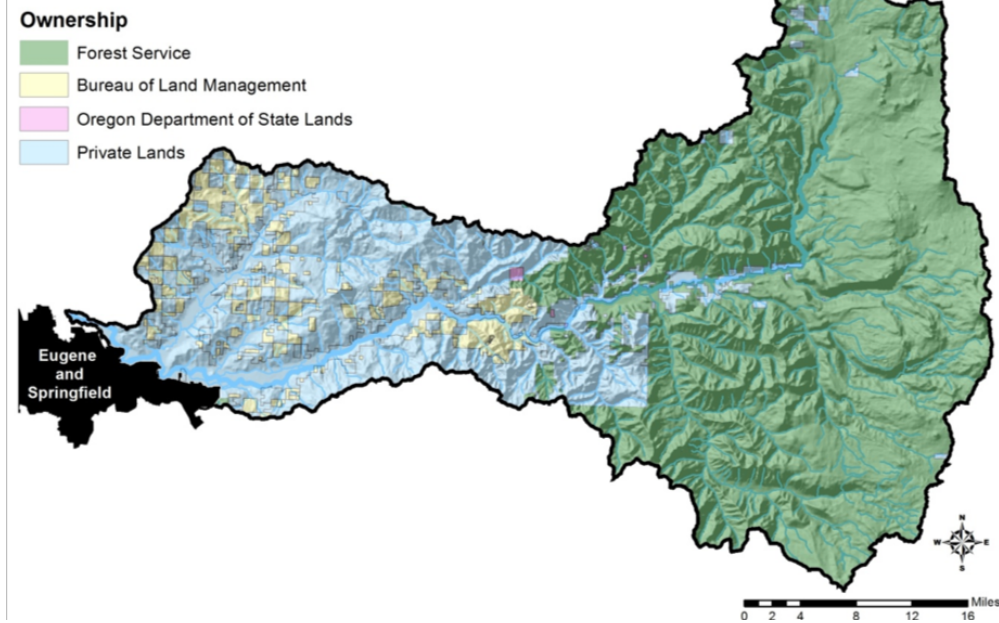
Do you wish to continue to the survey?

(By doing so you are providing consent to the IPRE to collect and use this information for research)

- Yes
- No

First, we would like to ask some questions about the McKenzie River Watershed.

McKenzie River Watershed



Q1 Do you know your drinking water comes from the McKenzie River?

- Yes
- No

Q2 In the past year, how often did you visit the McKenzie River Watershed?

- More than once a week
- 2-3 times a month
- Once a month
- A few times a year
- Once a year
- Never

Q3 How much does the McKenzie River Watershed enhance your quality of life?

- The McKenzie River Watershed is critical to my quality of life.
- The McKenzie River Watershed greatly enhances my quality of life.
- The McKenzie River Watershed somewhat enhances my quality of life.
- The McKenzie River Watershed slightly enhances my quality of life.
- The McKenzie River Watershed does not affect my quality of life.

Next, we would like to ask some questions about environmental conservation in the McKenzie River Watershed

Q4 How important is water quality to you relative to other environmental conservation efforts (for example: salmon habitat, air quality, forest management, organic farming, etc.)?

- Extremely important
- Very important
- Somewhat important
- Not very important
- Not at all important

Q5 How important is the quality of drinking water from the McKenzie to you?

- Extremely important
- Very important
- Somewhat important
- Not very important
- Not at all important

Q6 How urgent do you think it is for EWEB to put into action programs that maintain or restore the water quality of the McKenzie River Watershed before drinking water comes to your tap?

- Extremely urgent
- Very urgent
- Moderately urgent
- Slightly urgent
- Not at all urgent
- Unsure

Q7 Please indicate your level of agreement or disagreement with the following statements.

	Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree
<u>Wildfire</u> is a threat to water quality in the McKenzie	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<u>Climate change</u> is a threat to water quality in the McKenzie	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
EWEB should partner with <u>land management</u> agencies to encourage forest treatments such as thinning and controlled burns to reduce the risk of wildfire	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
EWEB should partner with <u>nonprofit</u>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

organizations to
 maintain and enhance
 water quality
 EWEB should partner
 with state and federal
agencies to maintain
 and enhance water
 quality
 EWEB should partner
 with private
landowners to
 maintain and enhance
 water quality

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q8 Programs and activities to maintain the benefits provided by the McKenzie River Watershed could be implemented by a variety of organizations. How much do you trust each of the following types of agencies and organizations to support natural resource health in the McKenzie River Watershed?

(Select one response for each agency or organization)

	Completely	A lot	Somewhat	Not much	Unsure
Federal natural resource agencies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
State natural resource agencies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Local Government	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eugene Water & Electric Board	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Private landowners in the watershed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Local Non-Profit Organizations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
National Non-Profit Organizations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q9 To what degree would you value regular communication (approximately monthly) regarding activities affecting the McKenzie River Watershed?

- Extremely valuable
- Very Valuable
- Moderately Valuable
- Slightly Valuable
- Not at all Valuable
- Unsure

Q10 To what degree do you agree or disagree with the following statements?

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I am more likely to trust government agencies when they work together.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am more likely to trust government agencies when they partner with non-profit organizations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collaboration and partnerships produce better outcomes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel better about programs and projects when I feel informed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Next, we want to ask some questions about drinking source water protection in the McKenzie River Watershed.

Please read the following: In 2018, EWEB completed a 10-year strategic plan for our Drinking Water Source Protection Program. The main goal of the program is to create a balance between watershed health and human use over time, and to maintain our community's exceptional water quality (for more information see: <http://www.eweb.org/community-and-environment/mckenzie-watershed-protection/drinking-water-source-protection-plan>).

Following is a list of the main programmatic elements of EWEB's approach to protecting the McKenzie Watershed:

- *Water Quality and Watershed Health Monitoring* - EWEB will measure and collect information on water quality in the McKenzie Watershed to monitor any changes and inform water treatment operations.
- *McKenzie Watershed Emergency Response System* - EWEB will maintain a watershed emergency response system for efficient and effective response to hazardous material spills.
- *Urban Runoff Mitigation* - EWEB will implement actions that mitigate, treat, and/or eliminate urban runoff from storm water outfalls upstream of the Hayden Bridge intake.
- *Riparian Forest Protection* - EWEB will invest in riparian and floodplain forest protection to promote natural treatment of pollutants, mitigate floods, reduce of sediment, and increase fish habitat.
- *Septic System Assistance* - EWEB will continue to work with McKenzie homeowners to reduce the impacts of septic systems on water quality.
- *Healthy Farms Clean Water* - EWEB will work with McKenzie farmers to reduce chemical use and increase riparian buffers to benefit water quality.
- *Healthy Forests Clean Water* - EWEB will work with partners to increase forest health to reduce wildfire risks, protect water quality, increase fish and wildlife habitat, and generate revenue for watershed restoration.

Q11 Before receiving this survey, were you familiar with EWEB's Source Water Protection Program?

- Yes
- No

Q12 In your view, how important or unimportant is EWEB’s source water protection program to the following populations?

	Extremely important	Very important	Somewhat Important	Not very important	Not at all important
To me personally	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
For EWEB ratepayers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
For Lane County Residents	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q13 To help EWEB understand how to prioritize source water protection efforts, please indicate how important each of the elements of EWEB’s Source Water Protection Program are to you. *(Note: programs are described on the previous page)*

	Extremely important	Very important	Somewhat Important	Not Very Important	Not at all Important
Water Quality and Watershed Health Monitoring	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
McKenzie Watershed Emergency Response System	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Urban Runoff Mitigation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Riparian Forest Protection	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Septic System Assistance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Healthy Farms Clean Water	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Healthy Forests Clean Water	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please tell us about your willingness to pay to protect the water quality of the McKenzie River Watershed and your drinking water.

EWEB currently funds the Source Water Protection Program through water rate fees. Water rates are subject to general management and board approval. Funds currently used for the Source Water Protection Program could be directed to other uses. Because maintaining water quality is not directly tied to water consumption, EWEB is considering other options for funding the Source Water Protection Program.

Q14 Currently the monthly amount supporting the Source Water Protection Program varies by the amount of water consumed. The current contribution is \$0.12 per 1,000 gallons (the average household uses 9,000 gallons per month). This equates to an average of \$1.11 per month (or \$13.32 per year) per household. Please indicate which fee structure is most desirable to you.

- The current program — customers who consume more water should pay more
- A flat fee assessed on all residential water customers (Appears as a separate line item fee on your monthly bill)
- A flat fee assessed on all (residential and commercial) EWEB water customers (Appears as a separate line item fee on your monthly bill)
- A tiered fee based on size of pipe (users with higher volumes have larger pipes; Appears as a separate line item fee on your monthly bill)

Q15 Suppose this EWEB Source Water Protection Program proposal was under consideration by the EWEB Board of Commissioners. This program would maintain or improve drinking water quality for EWEB customers now and in the future. If it cost your household \$13.32 each year would you support this program?

- Yes
- No

Q16 What is the maximum your household would pay each year for the EWEB Source Water Protection Program that would maintain or improve drinking water quality for EWEB customers now and in the future? Please indicate a dollar amount.

\$ / per year _____

Q17 Would you support a voluntary contribution beyond the existing amount to enhance funding for source water protection programs similar to the low-income heating or the green power contribution? (i.e., voluntary contributions would go toward programs like: land acquisition for conservation, green infrastructure, stewardship and restoration activities)

- Yes
- No
- It depends. Explain: _____

Q18 Would you be willing to pay for carbon offsets if they would provide a funding stream for drinking source water protection?

- Yes

- No
- It depends. Explain: _____
-

Finally, we would like to know a little bit about you.

Q19 How long have you lived in the Eugene-Springfield metropolitan area?
(Please enter a number rounded to the nearest year)

Q20 Do you consider Eugene or Springfield your permanent home?

- Yes
- No

Q21 What is your age?

- 18-19 years of age
- 20 to 24 years of age
- 25 to 34 years of age
- 35 to 44 years of age
- 45 to 54 years of age
- 55 to 64 years of age
- 65 years and over

Q22 What was your annual household income in 2016?

- Less than \$15,000
- \$15,000 to \$24,999
- \$25,000 to \$34,999
- \$35,000 to \$49,999
- \$50,000 to \$74,999
- \$75,000 to \$149,999
- \$150,000 to \$199,999
- \$200,000 or more

Q23 What is your gender identity?

- Male
- Female
- Other
- Prefer not to say

Q24 What is your race/ethnicity?

- Prefer not to say
- White
- Black, African American
- Native Hawaiian, Other Pacific Islander
- Latino/Hispanic

- American Indian, Alaska Native
- Asian
- Other _____

Q25 What zip code do you live in? _____

Q26 What is the highest degree/level of school you have completed?

- Less than high school graduate
- High school graduate (or equivalency)
- Some college or associate degree
- Bachelor's degree
- Graduate degree or higher

Q27 Indicate the number of people in your household.

Number of individuals who are 17 years of age or younger. : _____

Number of individuals who are 18 years of age or older. : _____

Total : _____

Q28 Do you rent or own the housing unity that you live in currently?

- Own
- Rent
- Occupy without Payment

Q29 Are you registered to vote in the state of Oregon?

- Yes
- No

Q29a Did you vote in the 2018 midterm election?

- Yes
- No

Q30 Is there anything else that you would like to share with us about water quality or source water protection?

Thank you for your input!