SEEING THE FOREST FOR THE REDWOOD TREES: UNDERSTANDING THE
SOCIAL IMPACTS OF A PROTECTED AREA ON A LOCAL COMMUNITY – A
NORTHERN CALIFORNIA CASE STUDY

By

Alicia Jones

A Thesis Presented to
The Faculty of Humboldt State University
In Partial Fulfillment of the Requirements for the Degree
Master of Science in Natural Resources: Forestry, Watershed, & Wildland Sciences

Committee Membership
Dr. Erin Kelly, Committee Chair
Dr. Steve Martin, Committee Member
Dr. Yvonne Everett, Committee Member
Dr. David Greene, Program Graduate Coordinator

July 2016
ABSTRACT

SEEING THE FOREST FOR THE REDWOOD TREES: UNDERSTANDING THE SOCIAL IMPACTS OF A PROTECTED AREA ON A LOCAL COMMUNITY – A NORTHERN CALIFORNIA CASE STUDY

Alicia Jones

The social movement and political process surrounding logging old-growth redwood stands on private property that eventually led to the creation of the BLM managed Headwaters Forest Reserve (Headwaters) made Humboldt County, California a focal point of environmental activism and heated debate for much of the 1990s. The objectives of this research are to (1) understand the social processes that led to the creation of the Headwaters, and (2) analyze the present day relationship between the people of Fortuna, California and the Headwaters. Data collection methods included door to door surveys (n=260) and interviews with key informants (n=18). Support for Headwaters was highest among those who had obtained higher levels of education, those who lived in Fortuna longer, older participants, and females. The creation of Headwaters occurred during the contentious timber wars, and exacerbated mistrust and misgivings of many community members in timber-dependent towns such as Fortuna. The primary barrier to increased support and success for Headwaters lies in the ability of people to access it. With increased community outreach, the BLM stands to improve its relationship with the community and possibly increase interest and visitation to
Headwaters. Overall, Fortuna has overcome much adversity and residents are beginning to soften their perspectives on Headwaters, demonstrating how the community has shown resilience both in the past and present, and has the opportunity to increase that resilience with time. Looking forward, BLM recognizes the potential for a meaningful and impactful relationship between the community and the Headwaters, and is committed to improving their connection with the community. Additional opportunities exist for Fortuna to capitalize on the Headwaters, as with more visitation and community involvement, they may consider the Headwaters to be a true asset to the community.
ACKNOWLEDGEMENTS

First and foremost, I would like to express my deep gratitude to my committee chair, Dr. Erin Kelly. Without her patience, creativity, intellect, and passion for seeing her students succeed, I could not have completed this project in only two years. I would like to thank committee members Dr. Steve Martin for his support as I navigated the world of surveying and statistics, and Dr. Yvonne Everett for bringing key insight and expertise to my research.

This project was made possible by the wonderful people at the Arcata Field office of the Bureau of Land Management (BLM), and the Redwood Parks Conservancy (RPC). A huge thank you to Ben Blom at the BLM for meeting with me almost weekly to ensure that the project progression was smooth, and for providing constant support as I ventured through this process. Thank you to Cathy Bonser at the RPC for making it possible for the Friends of Headwaters to form and for supporting my work along the way.

Thank you to the wonderful members of the HSU Spanish Translation and Interpretation Club for translating all of the survey materials. Each of you made it possible for my survey to reach a diverse set of residents in Fortuna.

To Trista Dowdy, Elizabeth Moreno, and Kristin Braun, I appreciate all of your help distributing surveys in Fortuna. Each of you brought such positive energy to the project and your assistance means so much to me.

To my amazing friends and family, I couldn’t have completed my Masters without your encouragement! To Ben, thank you for your unwavering love, support, and
confidence in me. Joanna Di Tommaso, your friendship and experience was invaluable to me and I am forever grateful for your ability to relate to my journey and pass along advice along the way.

Finally, this research would not have been possible without the generous funding provided by the Conservation Lands Foundation and the Bureau of Land Management.
## TABLE OF CONTENTS

ABSTRACT ........................................................................................................................ ii

ACKNOWLEDGEMENTS ............................................................................................... iv

LIST OF TABLES ............................................................................................................. ix

LIST OF FIGURES ......................................................................................................... x

LIST OF APPENDICES ................................................................................................. xii

PREFACE ........................................................................................................................... 1

  Community Collaboration ............................................................................................... 1

INTRODUCTION .............................................................................................................. 4

  The Case: The Headwaters Forest Reserve and the Community of Fortuna ............... 5

  Headwaters History: The Pacific Lumber Company .................................................. 9

  Headwaters History: Maxxam Takeover of the Pacific Lumber Company .............. 11

  Headwaters History: The Deal ................................................................................ 12

  Headwaters Today .................................................................................................... 15

LITERATURE REVIEW ................................................................................................. 16

  Protected Areas ........................................................................................................ 16

  Community Resilience ............................................................................................. 20

  Learning from the Past: The Creation of Redwood National Park ......................... 23
METHODS ....................................................................................................................... 25
Interviews ...................................................................................................................... 25
Surveys .......................................................................................................................... 28
Analysis ......................................................................................................................... 30
Quantitative Data Analysis ....................................................................................... 30
Qualitative Data Analysis ......................................................................................... 30
RESULTS ......................................................................................................................... 32
Qualitative Results: How the Headwaters Still Has People Talking ....................... 32
A Good Deal for Hurwitz, Not As Good a Deal for the Community ....................... 32
After the Deal: Hardship and Challenges Felt By All .............................................. 39
Seventeen Years Later: A Community Still Divided................................................. 44
Fortuna and Its Big Backyard: How Do We Get To the Headwaters? ..................... 46
Quantitative Results: Survey ......................................................................................... 50
Demographics ........................................................................................................... 51
Visiting the Headwaters Forest Reserve ................................................................. 54
Activities When Visiting Other Public Lands .......................................................... 58
Perceptions of Headwaters Forest Reserve ............................................................... 59
Perceptions of Headwaters Benefits ......................................................................... 66
DISCUSSION ................................................................................................................... 76
Community Support for and Perceptions of the Headwaters Has Changed Over Time 76

Local Livelihoods Were Affected By the Creation of the Headwaters ............................. 79

Access is the Largest Barrier for Headwaters Success ................................................. 80

Fortuna as a Resilient Community .............................................................................. 83

Learning from the Past: The Creation of Redwood National Park ............................ 84

CONCLUSION ................................................................................................................. 86

LITERATURE CITED ..................................................................................................... 89
LIST OF TABLES

Table 1: Age Groups for Survey Participants (n=253) ..................................................... 52

Table 2: Community involvement in various groups and organizations, expressed as
percent .................................................................................................................................. 54

Table 3: Desirability of participating in activities when visiting any public forest, park, or
land ................................................................................................................................... 59

Table 4: Non-parametric test results for support for Headwaters today and in 1999 against
length of time living in Fortuna, age, gender, and education. .......................................... 61

Table 5: Survey Participants Level of Agreement for Statements Regarding the
Community, Environmental, and Economic Benefits of Headwaters (HFR = Headwaters
Forest Reserve). ................................................................................................................ 67
LIST OF FIGURES

Figure 1: Location map of the Headwaters Forest Reserve............................................. 6
Figure 2: Historic range for coast redwood (*Sequoia sempervirens*) in California (Save the Redwoods League, 2014).................................................................................................. 8
Figure 3: Timeline highlights of the Pacific Lumber Company history, 1986-2000........ 14
Figure 4: Breakdown of Interview Participants by Affiliation (n=18). ............................ 27
Figure 5: Total participation broken down by gender and age (n=253). .......................... 52
Figure 6: Education completed by survey participants (n=256)..................................... 53
Figure 7: Number of participants who participated in various activities at the Headwaters during one or more of their visits................................................................. 56
Figure 8: Number of participants who stated that their likelihood to visit Headwaters would increase if one or more of these hypothetical scenarios were implemented at Headwaters (SPT = Salmon Pass Trail).................................................................. 58
Figure 9: Participants responses to the statement “I am likely to visit Headwaters Forest Reserve in the future,” expressed as a percent (n=230)............................................... 60
Figure 10: Participants responses to the statement “I supported the creation of the Headwaters Forest Reserve in 1999,” expressed as percent (n=177). ............................... 62
Figure 11: Participants views in response to the statement "I am supportive of the Headwaters Forest Reserve today," expressed as a percent (n=223)................................ 62
Figure 12: Participants responses to the statement “I am satisfied with the current management at the Headwaters Forest Reserve,” expressed as percent (n=135)............ 66
Figure 13: Participants responses to the statement “The HFR increases the desirability of Fortuna as a place to live,” expressed as percent (n=196). ............................................... 68

Figure 14: Participants responses to the statement “The HFR contributes to the distinctive community atmosphere and/or pride of Fortuna,” expressed as percent (n=199). .......... 68

Figure 15: Participants responses to the statement “The HFR protects natural landscapes and views,” expressed as a percent (n=220). ................................................................. 69

Figure 16: Participants responses to the statement “The HFR protects native fish, wildlife, and plant habitat,” expressed as a percent (n=216). ................................................................. 70

Figure 17: Participants responses to the statement “The HFR provides an opportunity for the public to learn about local history, culture, and/or natural world around Fortuna,” expressed as a percent (n=219). ................................................................. 71

Figure 18: Participants responses to the statement “The HFR provides a place of refuge from the busy world,” expressed as a percent (n=213). ................................................................. 72

Figure 19: Participants responses to the statement “The HFR increases local tourism revenue and appeal,” expressed as a percent (n=189). ................................................................. 73

Figure 20: Participants responses to the statement “The HFR positively contributes to the economy of Fortuna,” expressed as a percent (n=173). ................................................................. 74

Figure 21: Participants’ responses to the statement “The HFR contributes to the livability and charm of Fortuna,” expressed as a percent (n=203). ................................................................. 75
LIST OF APPENDICES

APPENDIX A: SURVEY PACKET MATERIALS (ENGLISH) ........................................ 94
APPENDIX B: SURVEY PACKET MATERIALS (SPANISH) .................................... 112
APPENDIX C: INTERVIEW QUESTIONS ............................................................ 129
APPENDIX D: ATLAS.TI CODE LIST ............................................................... 131
PREFACE

In remote Humboldt County, California, population 134,623¹, events in recent history have resulted in reverberations globally and locally. The social movement and political process surrounding logging old-growth redwood stands on private property that eventually led to the creation of the Headwaters Forest Reserve (Headwaters) made Humboldt County a focal point of environmental activism and heated debate for much of the 1990s. The objectives of this research are to (1) understand the social processes that led to the creation of the Headwaters, and (2) analyze the present day relationship between the people of Fortuna, California and the Headwaters. This preface serves to help the reader understand the context of the thesis research.

Community Collaboration

In 2014, Humboldt State University (HSU), the Bureau of Land Management (BLM), and the Redwood Parks Conservancy (RPC)² entered into a partnership centered

¹ US Census Bureau, 2015
² Redwood Parks Conservancy (RPC) is a non-profit cooperating association based out of Crescent City, California. The mission of the RPC is “to foster understanding, enjoyment, and stewardship by providing support to our partner agencies – the National Park Service, California State Parks, the U.S. Forest Service, and the Bureau of Land Management at the Headwaters Forest Reserve – who are entrusted with the care of northern California’s public lands.” The RPC vision statement is, “Northern California’s coastal public lands are special places, rich with historical, cultural, and natural resources
on developing and improving interest in volunteer and stewardship opportunities at the Headwaters. The focus of the partnership was to involve HSU students in a program that would expand the reach of the RPC’s support for public land stewardship, environmental education, and public land recreation at the Headwaters and other areas within the National Conservation Lands system. Through this effort, HSU and the RPC have provided, and continue to provide, crucial support for the BLM’s management goals for the area.

The principal objective of the HSU, BLM, and RPC partnership is to increase stewardship and volunteer opportunities in the Headwaters for the local community, and to expand the reach and quality of the BLM’s environmental education and recreation objectives in the Headwaters. To support these goals, a non-profit affiliate called the **Friends of Headwaters** has been created and is nested under the RPC umbrella. This group serves as a way for the local community to connect with on-the-ground activities, such as restoration and recreation, at the Headwaters. I have served as the principal representative of the **Friends of Headwaters** since its inception in the fall of 2014, and have worked with the BLM and RPC to create a social media and internet presence, as well as gain community interest in group involvement.

This case study research contributes to the future of the **Friends of Headwaters** as the results will help the BLM and RPC understand how residents of the community of Fortuna (the nearest geographical city to the Headwaters) currently use and perceive the that inspire those who visit them. Through expanded education, these unique resources will be enjoyed and protected for generations to come.”
Headwaters. The BLM and RPC will have the tools available to tailor their outreach approach to the community, thereby increasing interest and involvement in the *Friends of Headwaters* and the Headwaters itself. The BLM and RPC hope to build upon this relationship over time and maintain a social connection with the community.
INTRODUCTION

Protected areas play a very important role in conserving ecosystems and their inherent biodiversity, but they also have social impacts, particularly on nearby communities (Mannigel, 2008; West et al., 2006). Traditional park management approaches have been criticized for historically showing local people little sympathy for the challenges protected areas create for them, as some managers go as far as to rely on guard patrols and punishment to exclude local residents (Wells & Brandon, 1992). Beginning in the early 1990s, a new approach to protected area management has been adopted, in which the needs of local communities are addressed, local participation is encouraged, and conservation and development are of equal focus (Wells & Brandon, 1992). Studies on protected area impacts have been concentrated in developing nations, creating a need for further research in developed nations (Fortin and Gagnon, 1999). Through case study research in Northern California, this project aims to contribute to literature on the social dynamics associated with protected areas in the United States. The case includes the relationship between the Headwaters Forest Reserve (Headwaters), which was created out of intense social and environmental conflict surrounding the harvesting of old-growth redwood, and the nearby community of Fortuna, California.

This case-study seeks to understand the socio-political and economic dynamics that influenced the creation of the Headwaters as well as the present-day relationship between Fortunans and the Headwaters. To achieve these ends, I asked:
1. What processes and events in local history influenced the creation of the Headwaters?

2. How is present-day Headwaters fulfilling its original intended purposes, and how is it not?

3. How do Fortuna residents view the Headwaters, and how do they utilize it?

The Case: The Headwaters Forest Reserve and the Community of Fortuna

The Headwaters is located in the mountainous North Coast region of California. It sits in the Elk River and Salmon Creek watersheds in central Humboldt County (Figure 1). The Headwaters is located ten miles southeast of the city of Eureka, and five miles northeast of the town of Fortuna. The 7,472 acre parcel is highly valued for its ecological importance, including:

- Intact, functioning late seral (old-growth) forest ecosystem dominated by coast redwood (*Sequoia sempervirens*) and Douglas-fir (*Pseudotsuga menziesii*) trees, and

- Habitat for a number of species listed as federally threatened by the U.S. Fish and Wildlife Service, including: marbled murrelet (*Brachyramphus marmoratus*), northern spotted owl (*Strix occidentalis caurina*), coho salmon (*Oncorhynchus kisutch*), Chinook salmon (*Oncorhynchus tshawytscha*), and steelhead trout (*Oncorhynchus mykiss*) (State of California, 2016).
Coast redwoods are renowned for their spectacular size and can live for upwards of 2000 years (Save the Redwoods League, 2014). They are the tallest trees in the world with some exceeding heights of 350 feet and diameters of 20 feet or more (Bevington, 2009). More than 95 percent of the 2-million acre redwood zone, which stretches from Big Sur, California to southern Oregon, has been harvested, leaving approximately 120,000 acres of virgin old-growth redwood (Figure 2) (Save the Redwoods League, 2014). Most of the remaining ancient redwood groves are protected in California state
parks and Redwood National Park, with remnant scattered islands of old-growth redwood privately owned (Bevington, 2009; Headwaters Forest Coordinating Committee, 1997). These groves are usually small, ranging from a couple hundred to a couple thousand acres in size, which is generally not large enough to support fully functioning ecosystems (Bevington, 2009). Prior to its designation as public land, environmental groups suggested that Headwaters was the most important privately held old-growth redwood forest, as it forms a crucial ecological link between the redwood parks to the north and south (Headwaters Forest Coordinating Committee, 1997).
Figure 2: Historic range for coast redwood (*Sequoia sempervirens*) in California (Save the Redwoods League, 2014).
The city of Fortuna, California is the nearest incorporated community to the Headwaters. According to the U.S. Census Bureau, the 2010 population was 11,926 people with 4,991 housing units. The median household income (in 2014 dollars) was $42,450, almost $20,000 less than the California median income ($61,489) and $11,000 less than the United States national median of $53,482 (U.S. Census Bureau, 2015) (Figure 3). The community is historically timber-dependent, though that industry has declined in terms of employment and income.

Headwaters History: The Pacific Lumber Company

The land comprising present-day Headwaters was previously owned by Pacific Lumber Company (PL), a large industrial publicly traded forest company founded in 1863 (Freeman, 1967). PL began operations in Humboldt County in 1882 and their prosperity is attributed to the rush for “red gold” (redwood trees). By the 1980s, they had developed a company-owned town called Scotia (10 miles south of Fortuna), and built up their milling infrastructure to include two mills, a special products manufacturing facility known as “the factory,” a plywood plant, and a pres-to-log plant (F. Bacik, personal communication, April 4, 2016; Freeman, 1967). PL had a reputation for being focused on families and was known for their paternalistic relationship to nearby communities – offering college scholarships for children of employees, throwing holiday parties and picnics, and giving out Christmas trees (Freeman, 1967).
Throughout its history, PL improved timber production efficiency through the use of technology upgrades. In 1928, timber fallers began felling trees using drag saws instead of cross cut saws, which was advantageous to the timber faller because it reduced their physical exertion by allowing them to stand upright fully instead of the crouched position required to use a cross cut saw (Freeman, 1967; Van Vleck, 2000). In 1941, the company began using chainsaws, eliminating any size limitations that previously existed, and allowing for harvest of the largest redwoods (Freeman, 1967).

In the late 1930s, PL began implementing selective harvesting coinciding with the introduction of newest harvesting systems technology: tractor logging. This allowed the company to shift from practicing even-aged management (clear-cutting), and move towards selective cutting (Freeman, 1967; Mendocino Redwood Company & Humboldt Redwood Company, 2011). Prior to the introduction of tractor logging, when the company set up harvesting operations in an area, all the trees had to be cut, leaving the area devastated, only to be reseeded by edge trees (Freeman, 1967) and coppice sprouting. By using tractors, it was possible to build roads, allowing the loggers to be selective and remove only mature trees, leaving seed trees in the logged over areas to propagate the future crop (Freeman, 1967). PL predominantly practiced uneven-aged management through the 1980s (Mendocino Redwood Company & Humboldt Redwood Company, 2011). They implemented the practice of sustained yield logging in order to ensure that their supply of timber across their ownership would not be depleted (Freeman, 1967). This conservative forest management plan ensured that the company would never run out of large trees 150 years or older (Hackett, 2011).
Headwaters History: Maxxam Takeover of the Pacific Lumber Company

By the 1980s, PL had a diversified portfolio, including a lucrative welding operation and high rise building in the San Francisco Bay Area (Harris, 1997). The company had survived over 100 years of economic peaks and valleys based on their implementation of sustained yield directed harvesting and a modest financial strategy (Harris, 1997). In 1986, the Texas-based Maxxam Corporation, headed by financier Charles Hurwitz, purchased a majority of PL stock in what is known as “the takeover,” making it the primary shareholder of the company (Figure 4) (Harris, 1997). As CEO of Maxxam, Hurwitz’s reputation was earned because he would buy out companies through money raised with high-interest junk bonds, and immediately sell off the company’s most valuable assets (Bevington, 2009). Because of PL’s 50 plus year commitment to conservative forest management practices, 70% of the remaining privately-held old-growth redwoods were located on PL property (Hackett, 2011). This made PL an acquisition target for Maxxam as they held a virtual monopoly on the commercial supply of the extremely valuable and durable heartwood of the trees, and it became an easy asset for Hurwitz to liquidate in order to pay off the $800 million debt required to finance the transaction (Bevington, 2009; Cobb, 2008; Hackett, 2011; Harris 1997). Hurwitz rapidly increased the harvest rate, targeting high-value old-growth redwood timber, in addition to aggressively liquidating the company’s other assets and the employees’ pension funds (Cobb, 2008; Harris 1997).
Headwaters History: The Deal

Maxxam’s rapid clearcutting of old-growth redwood trees outraged environmental activists nationally (Harris, 1997). The environmental community protested in multiple ways, including direct action such as tree sitting, tree spiking, and creating human blockades on logging roads (Bevington, 2009). The focus on PL was due to their ownership history – because the company had been conservative in its timber practices, it retained some of the last and largest contiguous privately held redwood timber stands.

Humboldt County became a center of the “timber wars,” and the protection of the Headwaters Forest was the focus of the campaign against Maxxam (Bevington, 2009). During this era, environmentalists representing groups including Earth First!, the Environmental Protection Information Center (EPIC), and the Sierra Club advocated for protecting the redwoods in the Headwaters grove (Barbour et al., 2001; Bevington, 2009). Both locals and outsiders from all over the U.S. became active in the campaign to save the old-growth redwood stands (Cobb, 2008). Environmental activists trespassed onto Maxxam’s property to examine areas scheduled to be logged, and protestors held demonstrations across the county expressing outrage over Maxxam’s timber harvesting practices (Bevington, 2009). Activists also participated in direct action on PL property, such as tree-sits and road barricades in order to bring media attention to the issue (Bevington, 2009). In the summer of 1990, thousands of college students and other supporters converged in northern California to take part in “Redwood Summer,” an event
aimed to engage non-violent citizen disobedience and bring national attention to the predicament over old-growth redwood forest harvesting (Bevington, 2009).

During this time, EPIC filed over 20 lawsuits against Maxxam and its logging practices and their success in the courts led to more scrutiny by state agencies for Timber Harvest Plans (THPs), especially in areas containing old-growth (Barbour et al., 2001). As a result, PL was required to account for the residual effects of harvesting in old-growth stands and take measures to protect dependent species, including the marbled murrelet and northern spotted owl, prior to harvest (Barbour et al., 2001). In 1992, the marbled murrelet was listed as a state endangered species by the U.S. Fish and Wildlife Service (State of California, 2016). Despite the listing, PL continued to enter old-growth habitat to harvest timber and consequently, a series of court trials ensued where they were convicted of violating state and federal laws (Barbour et al., 2001). In 1995, PL management realized that they could no longer harvest in marbled murrelet habitat anywhere on the property and filed a lawsuit against state and federal governments (Harris, 1997). They claimed that excessive regulations prevented them from harvesting on their property and making a profit, citing potential losses of over $500 million (Barbour et al., 2001). Wanting to avoid potentially lengthy and expensive battles in court with PL, state and federal officials intensified their efforts to find a solution (Barbour et al., 2001). The answer was to purchase some of PL’s old-growth timberland, allowing PL to suspend the lawsuit, out of which a deal was reached (Harris, 1997). On March 1, 1999, 7,472 acres of PL timber land, known as the Headwaters grove, was purchased by the BLM and State of California (Figure 4) (BLM, 2003). The old-growth portion was
over 3,000 acres, a size comparable to some of the largest groves protected in state and national parks (Bevington, 2009). The name “Headwaters Forest Reserve” was coined, paying tribute to Salmon Creek and Elk River whose headwaters begin within the reserve (Harris, 1997). Under “the deal,” as it came to be known, the federal government paid $250 million and the state of California paid $130 million in exchange for the Headwaters grove and one additional adjacent old-growth grove, Elkhead Springs, and its surrounding buffer (Bevington, 2009). The deal was contingent upon approval from the federal government for a habitat conservation plan (HCP) and a state-level sustained yield plan that Maxxam would implement its remaining 211,000 acres (Barbour et al., 2001).

Figure 3: Timeline highlights of the Pacific Lumber Company history, 1986-2000.
The process of the creation of Headwaters, coupled with a downshift in the timber economy, remains a sore subject for many residents in the community of Fortuna. It is common in timber-dependent communities for well-established timber companies to serve as a major employer and hold great economic power in communities where they have production facilities (Beckley, 1995). This holds true for the families who have worked in the timber industry in Humboldt County for generations, and firms like PL (and subsequently Maxxam and its successor Humboldt Redwood Company) have historically employed much of this population. The war between Maxxam and the environmental community outraged many timber families, as it threatened their livelihood and for some, ended their career with PL.

In 2014, the RPC, a local 501(c)(3) non-profit dedicated to supporting redwood parks and protected areas, partnered with the BLM to create a group called Friends of Headwaters. It is through this volunteer group that the BLM and RPC hope to engage the community of Fortuna in supporting the restoration of the Headwaters by providing opportunities for the community to participate in the ongoing management and stewardship of the land. The results of this research will help the BLM understand how the community views and uses Headwaters, and how they can build upon the existing relationship via Friends of Headwaters. Through this partnership, the BLM hopes to foster positive relationships with the local community and help heal the broken ties that resulted from the conflict-ridden history of the land comprising present-day Headwaters.
LITERATURE REVIEW

Protected Areas

One tool of environmental conservation is the enclosure of lands into publicly-owned national parks, preserves, and reserves in an attempt to safeguard natural resources in perpetuity. While parks are not the only way to protect forests (Hayes, 2006), this method is a common solution to the need for establishing conservation efforts in a specific region as they are “an indispensable tool in that regulatory toolbox” (Wilkie et al., 2006, p. 247). Globally, protected areas positively influence species and forest conservation efforts by focusing on protecting high levels of biodiversity and/or rare or unique species (Pimbert and Pretty, 1995; Hall et al., 2014). In this section, I review the relationships between people and protected areas, focusing on the impacts of protected areas on communities.

Many in the conservation community argue that it is essential that protected areas exist in order to ensure the sustainability of Earth’s biological systems and the health and welfare of people (Wilkie et al., 2006). However, this is not without debate on the impacts of these areas on local communities (Hall et al., 2014). Despite their appeal, many protected areas have proven unsuccessful as local communities have little to no involvement in management, large sums of money have been spent to protect the areas, and few community benefits exist, undermining both long-term conservation and livelihood security in and around protected areas (Pimbert & Pretty, 1995). Protected
areas establishments can also place restrictions on how locals use the forest and even displace locals (Clements et al., 2014). As Brockington and Schmidt-Soltau (2004) state, “The welcome gains made for protected areas in the last generation have been accompanied by the silence over its social costs” (p. 141). In the Global North, local and indigenous people and uses have been excluded from protected areas, and these protected areas have been blamed for causing local people harm, providing benefits at the expense of local communities, costly protection of the protected area, and ineffective biodiversity conservation (Schelhas, 2001).

Land enclosures can impact the social structure of adjacent communities (Fortin and Gagnon, 1999). These areas affect the lives of the people living within and adjacent to them, as well as the employees of agencies, governmental and non-governmental, who create and manage them, by redirecting how people understand, use, and interact with their surroundings (West and Brockington, 2006). The impact that new land ownership has on community livelihood varies with the relative dependence that the community has on a protected area, but local people may disproportionately bear the costs when it comes to the global benefits of biodiversity and ecosystem services that are provided by protected areas (Clements et al., 2014). In addition, substantial literature from developing countries supports the notion that pre-existing economic and social problems can jeopardize the effectiveness and existence of preserved areas (Fiallo and Jacobson, 1995). One of the reasons local communities may contest protected area establishment is because these areas impact property rights and distribution of benefits (for example), and can cause struggles with community members’ future welfare by insufficiently
compensating for lost property rights and income (Wilkie et al., 2006). Negative impacts on local livelihoods include marginalization due to reduced access to resources and physical displacement (Hall et al., 2014). Additionally, studies show that if a protected area does generate revenue, the funds’ distributed can be skewed, resulting in minimal local development and, often at best, partial compensation for rural residents’ loss of property and rights (Wilkie et al., 2006).

As one of the most important stakeholder groups in protected areas, local residents and landowners are often not given much attention from planners and managers of protected areas due to limited funds, time, and/or knowledge (Nastran, 2015). Yet studies show that costs of park management can be very high and if local communities are not supportive of park creation, the ability of the park to protect resources can be affected (Pimbert & Pretty, 1995). These issues have resulted in local people discrediting the structure of protected areas, raising a need for demonstrating how these communities can tangibly and immediately benefit from conservation areas (Pimbert & Pretty, 1995). Initiatives encouraging locals to be more involved in conservation efforts have gained support since the 1980s with the development of strategies, such as providing economic incentives, to forge links between communities and protected areas (Infield, 2001).

There are many types of relationships that exist between protected areas and surrounding communities. Variations among land tenure, land use rights, number of people living in and around the area, and the level of community involvement are some of the ways in which this relationship can differ (Campbell et al., 2008). Campbell et al. (2008) argue that through community outreach, education, and involvement, local
support for protected areas can increase, thus having a positive effect on conservation efforts. By outlining clear conservation and development strategies to identify the needs of all involved parties, a mutually beneficial solution may be reached for locals and protected areas alike (Hough, 1988).

Nastran (2015) found that the perceptions of local people toward protected areas influence the success of the area, and the attitudes, actions, and interactions that visitors have with the protected area and she provides guidelines and possible implications for improving public perception towards protected areas. She states that when ideas regarding protected area management come from local stakeholders, they inherit a sense of responsibility for the area, view it as an opportunity, and cooperate with managers, leading to positive relationships between local people and the protected area. When locals are denied access to protected area resources or decision-making, tension can build between residents and protected area officials (Campbell et al., 2008). If locals are not consulted when government agencies determine purposes for land allocation, residents may simply ignore the new regulations, or worse, violent conflict may ensue (Campbell et al., 2008). On the other hand, when people feel as if they have been treated fairly, they will place more trust in the institution making decisions concerning the protected area (Nastran, 2015). There are many effective ways to include local people, ranging from compensation for costs incurred, to full co-management of the protected area (Campbell et al., 2008). Collective resource management programs involve people who are knowledgeable about local resources and conditions and work collectively to sustainably use natural resources over the long term (Pretty, 2003). This has proven effective in many
sectors, including forest, wildlife, fishery, and watershed management (Pretty, 2003). Community outreach via environmental education can increase support for protected areas as communities begin to understand the varied benefits, including economic, that can come along with these areas (Campbell et al., 2008).

Community Resilience

Community is a concept that is widely acknowledged as being ambiguous, multifaceted, constantly evolving, and influenced by people’s understandings of the word (Green et al., 2006; Mannarini & Fedi, 2009). Definitions vary depending on the context in which it is applied. However according to Hillery (1955), the majority of definitions of the word “community” include three important elements: area, common ties, and social interaction. Rovai (2002) suggests that the most essential elements of community include “mutual interdependence among members, connectedness, trust, interactivity, and shared values and goals” (p. 321). Gusfield (1975) noted that there are two major uses of the term community, one being territorial and geographical (i.e. town, city, neighborhood), and the other being relational, or, concerned with the character of the human relationship without heeding the location. An appropriate definition of the concept of community for this research is from McMillan and Chavis (1986), who state that a “sense of community is a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members’ needs will be met through their
commitment to be together” (p. 9). It is with this definition in mind that I identify the study area of Fortuna as a community.

A resilient community is one whose economy is diverse, maintains solid social and political ties, and is capable of organizing itself to actively respond to threats and opportunities (Buikstra et al., 2010). The concept of community resilience is often applied to place-based communities, many of which have ties to local resources (i.e. farmers) and/or historical intimacy with the local lands (i.e. forest-based communities), and see a correspondence between the health and resilience of both the community and surrounding environment (Berkes and Ross, 2013). Although there are many definitions of community resilience, the majority center on the idea of overcoming adversity (Buikstra et al., 2010) and adapting to change (Magis, 2010). Berkes and Ross (2013) point out that a community’s resilience can be understood as the ability of the social system to unite toward a common objective.

Brown and Kulig (1996/1997) define community resilience as “the capacity of community members to engage in projects or coordinated action within the context of their community despite events and structures that constrain such projects” (p. 43). According to Magis (2010) community resilience, is “the existence, development, and engagement of community resources by community members to thrive in an environment characterized by change, uncertainty, unpredictability, and surprise” (p. 402). The ability of a community to successfully mobilize and respond to stress is determined by a community’s resilience and is crucial for social sustainability (Magis, 2010).
Buikstra et al. (2010) examined individual and community resilience within rural Australia where many communities are experiencing chronic adversity due to long term restructuring and severe drought. They found that social networks and support were considered to be the crucial factor in maintaining a resilient community (Buikstra et al., 2010). They also discovered that the process of learning from experience and taking the areas’ unique history into consideration are important for communities to adapt and cope with change (Buikstra et al., 2010).

In order for communities to thrive and become resilient, Magis (2010) claimed they must (1) learn to live with change and uncertainty, (2) strategically develop resilience through planning, collective action, innovation, and learning, (3) facilitate resilience by developing and engaging an array of diverse community resources, and (4) engage community resources by taking action and not solely focusing on developing community capacity. Magis (2010) is keen to point out that communities are not in control of all of the conditions that affect them, such as who owns the land or what industries influence the local economy. She also points out that community resilience is not centered on the ability to control all of the conditions affecting the community; rather it is about the ability of the community to respond to the change (Magis, 2010). The case of the Headwaters and Fortuna provides an excellent canvas for understanding the elements of community resilience and the way in which communities and levels of resilience change over time.
Learning from the Past: The Creation of Redwood National Park

One hour north of Fortuna sits the formerly booming timber town of Orick, California. In 1968, 30,500 acres of private industrial timberland was purchased for $92 million through legislative procedure to contribute to the establishment of the Redwood National Park (National Park Service, 2015; Walker, 1984). This park surrounds Orick, and was expanded ten years later by 48,000 acres, purchased from its industrial timberland owners for $359 million (National Park Service, 2015; Walker, 1984). The establishment of Redwood National Park brought with it promises of a booming tourism industry that guaranteed increased revenue in the local economy and employment opportunities for the community (Walker, 1984). Instead, the park “triggered a downward economic spiral that stole good-paying jobs, savaged the timber industry and sentenced the area to chronic hard times and heartbreak” (Kiester, 1993, p. 42). The population of Orick dropped from 1,500 to about 600 with the creation of the park, and subsequent tourism employment opportunities have been major disappointments for the community (Kiester, 1993).

Fast forward 31 years to the creation of Headwaters in 1999, where Fortunans still remembered the creation of Redwood National Park and feared for a similar outcome for their community. Kiester (1993) said that the “most dire prediction, that the park would destroy the county’s economic base, came true,” (p. 45) and quoted Humboldt State University economics professor, John Grobey, who said that “the taxpayers spent a lot of
money, but not much came of it. Certainly not much benefited the people here. They feel betrayed” (p. 45). The example of Orick thus created some wariness for Fortunans.
METHODS

This study utilizes a mixed methods research approach, encompassing three key elements: interviews, a survey, and participatory action research. I elected to implement a mixed methods approach in order to provide a wider and deeper understanding of the topics addressed in the study. As Hussein (2015) points out, the credibility of the study can increase when qualitative and quantitative methods are used in conjunction with each other. I targeted specific individuals to be interviewed based on their unique ties to Headwaters and intimate understanding of the process surrounding its creation. Individuals representing an array of views and experiences were interviewed to provide a robust depth of information on the topics at hand. The survey was designed to reach the general population of Fortuna and obtain information regarding the community’s views, use, and perceptions of Headwaters. Together, this information can be combined to yield results that are meaningful for future management and planning at Headwaters for the community, the RPC, and the BLM.

The Institutional Review Board for the Protection of Human Subjects approved this project on September 17, 2014 (IRB 14-203).

Interviews

I conducted 17 interviews with 18 participants between August and October 2015, lasting from one to two hours each, with key stakeholders representing regulatory
agencies (n=3), environmentalists (n=4), former PL employees (n=8), neighbors of the Headwaters (n=1), and Fortuna city leadership (n=2) (Figure 5). Initial interviewees were determined based on their expertise and connection to the Headwaters, and additional interviewees were selected through snowball sampling, wherein interviewees refer the researcher to additional potential interviewees through referrals based on characteristics that are of interest to the research (Biernacki & Waldorf, 1981). Interviewees were also discovered through personal interaction during the survey distribution process. Those that were interested in providing further information on their personal experience during the creation of the Headwaters filled out a contact card and included it in their survey packet. I selected three individuals I felt could contribute to the research and asked them to be interviewed. Every interview was audio recorded, transcribed, and coded. Data was organized and analyzed using qualitative data analysis software, Atlas.Ti.
Interview questions were centered on the interviewee’s knowledge and experience with the process surrounding the creation of the Headwaters and the resulting effects that the community of Fortuna has experienced (Appendix C). Interviewees were asked about their personal background and how they were personally or professionally connected to the Headwaters. Often, this question accomplished more than intended, as interviewees were eager to discuss their experience surrounding the creation of the Headwaters, what the vision of its creation was, and the effects of the process on local social, natural, and economic processes, all of which were discussion themes for each interview. Participants were asked how they thought Fortuna should benefit from the Headwaters, and what potential relationship exists for the two. All interviewees were also asked to provide names of other stakeholders in the Headwaters creation process that could provide more
information or a different view on the topic. The interviews were conducted in a semi-structured format, allowing informants the freedom to express their views on the subject(s) on their own terms and in ways that made the most sense to them (Cohen & Crabtree, 2006). Although interview questions were predetermined, the order and wording were modified as needed and certain questions that were not relevant for a particular interviewee were omitted (Robson, 2002).

Surveys

Door to door surveys were conducted in the city of Fortuna, California in June and July 2015. Using ArcMap, I concentrated the study area on all housing units within the city limits of Fortuna, California. A housing unit is defined as

“A living quarter in which the occupant or occupants live separately from any other individuals in the building and have direct access to their living quarters from outside the building or through a common hall” (U.S. Census Bureau, 2015).

According to the U.S. Census Bureau (2015), Fortuna had 4,991 housing units in 2010. I aimed to distribute 600 to 700 surveys in the community (12% to 14% of the total Fortuna housing units), anticipating a 50% response rate. With the assistance of a summer intern working for the RPC, we visited over 1,000 housing units in Fortuna. We distributed 626 English surveys and 20 Spanish surveys, totaling 646 surveys.
Included in each survey packet was a survey, informational letter, pre-paid return envelope, and contact card for survey participants interested in participating in an interview at a later time (Appendix A). The survey included ten questions and took less than five minutes for most participants to complete. Because of the short length of the survey, we provided each participant with the option to complete it in our presence to ensure that we received a response and also so we were available to answer any questions. Survey questions focused on the participant’s individual interactions, opinions, and views of the Headwaters. Only one survey was distributed per housing unit, and participants were required to reside within the city limits of Fortuna and be at least 18 years of age.

In Fortuna, 17% of people identify as Latino or Hispanic (U.S. Census Bureau, 2015). We took two measures into account in order to accommodate the significant population of Latino and Hispanic people in Fortuna: (1) we had all of the survey materials translated into Spanish, courtesy of the Humboldt State University Spanish Translation and Interpretation Club, and (2) we enlisted the assistance of a fluent Spanish speaker to provide translation help when visiting the homes of Spanish-speaking Fortunans (Appendix B).

We implemented a systematic survey design where we visited every sixth home. We began this process by rolling a six-sided die, and would proceed to count housing units beginning at the number rolled. The sixth housing unit would be selected to participate in the survey. If a person was home who could not or refused to participate, or if no one was home, we would move on to the next housing unit and ask that they
participate. If rejected, we would continue to move to the next house. If we went six
housing units in a row with no participation, we would start our counting over.

Participants were asked to mail in their surveys by September 1, 2015. We mailed
out a second round of surveys to housing units who we had not received a response from
at the end of August 2015 and included a reminder card asking participants to return the
survey by September 26, 2015.

Analysis

Quantitative Data Analysis

Survey data was organized and analyzed using IBM SPSS Statistics software. I
used nonparametric tests to understand the data, including Kendall’s tau-b and
Spearman’s rank-order correlation, to evaluate the data. I also used a chi-squared test. No
names were collected at the time of survey administration, so all participants are referred
to by the unique identification number listed on the back of their respective survey.

Qualitative Data Analysis

Interview data was transcribed by a third party (Landmark Associates, Inc.).
Coding was done using the qualitative data analysis program Atlas.Ti. A total of 100
codes were developed and assigned to the interview data (Appendix D). The process of
coding involved assigning categories or concepts to pieces of information that are related
to research objectives (Friese, 2012). To ensure confidentiality, interviewee names were
omitted from all transcriptions and each was assigned a unique identification number for transcriptions and coding, ensuring the anonymity of each participant.
RESULTS

Qualitative Results: How the Headwaters Still Has People Talking

A Good Deal for Hurwitz, Not As Good a Deal for the Community

When interviewees were asked to reflect on the takeover of PL by Maxxam and Charles Hurwitz, a resounding sentiment was clear: they could see from the beginning that this was an unsustainable way to operate a company in the business of growing and marketing trees, especially in a specialty market such as old-growth redwood. One interview participant summarized the feeling expressed by the stakeholders well: “It should never have happened. Hurwitz should never have been allowed to do what he did, and it hurt everybody3” (Interview #2, environmental activist, 2015). Not only would the takeover affect the prosperity of PL’s future harvesting of redwood old-growth, but it also had a long-term impact on the timber workers. A prominent environmental activist demonstrated the worker component of this idea well:

[It] really illustrates the power that we’ve given to corporations over the needs of the average person, ‘cuz everyone knew this was not good for the people in this area. Very temporary; everybody got a little extra money, and it was over. The pension plan is shot. The college scholarships are gone. It’s over. We predicted in 1987 that at the current rate of cutting this would last 20 years, and Maxxam would get out. That’s exactly what happened, to the day almost; 20 years. We saw that, and we weren’t any experts, but it was clear. We just did the math. Here’s the inventory, here’s the cutting rate. We did the math, and sure enough, boom, gone. Everyone was able to do that. My takeaway from this is that if the people of

3 All quotes have been modified in insignificant ways to facilitate reading (e.g. removing filler words and phrases such as “oh,” “um,” and “you know.”)
Humboldt County had refused to go along, Maxxam wouldn’t have gotten away with this (Interview #6, environmental activist, 2015).

A former PL employee also expressed the reality of Maxxam’s long term impact on PL workers:

It’s a sad situation when that guy showed up. You could see the handwriting on the wall. You knew what was going on. Working the mills up here and stuff, not too many people back in those days paid attention to what was happening on Wall Street. It’s all about the football game and the weekend to do something… this guy he was just too big…The only thing you could do was fight, and you know, like I said, the takeover was questionable. The stock thing was worth fighting for, and the pension was definitely worth fighting for. We didn’t get much of a pension. They screwed us. I might have had a…pretty good pension coming from them, but now I’m just really screwed (Interview #17, former PL employee, 2015).

Another influential environmental activist put the rest of this idea surrounding the detriment to the old-growth redwood industry into context:

Part of the travesty wasn’t just loss of the forest, but also just the loss of the future of the community. We realize what we’re up against in terms of having to deal with private lands versus public lands and all that sort of thing. We recognized, early on, that, a lot of times, we were portrayed as being anti-forestry, but we often included the message of sustainability in forestry. We talked a lot about that. We educated ourselves and the public, to a larger extent, what that meant, and especially redwood. Why wouldn’t you wanna care for redwoods in a way that you wouldn’t log them when they’re 40 years old, not even in good wood? Why not have a sustainable future, especially in a rich market like redwoods? (Interview #2, environmental activist, 2015).

When the takeover happened, Hurwitz vastly increased the PL workforce to keep up with the production needs associated with an increased harvesting rate. While this boom in employment was positive for some families, its negative effects could be seen in certain hiring practices, including hiring unqualified workers. A former PL timber faller described the new workforce dynamic brought in with the Maxxam era of redwood timber harvesting:
Normally like an old-growth faller, you would work with somebody falling timber, unless you’re breaking in your own son, and then it’s a gradual thing. To get that much experience to fall old-growth timber took a lot of years. They were hiring people off their crew with no experience falling timber, guys that wanted to go cutting, and they would put them with like somebody like me or somebody else. They would never give them to us long enough to really teach them anything. I’ve had guys for as little as month, and this guy’s supposed to go fall timber. He’s got no experience. There’s a lot more to just putting a notch in a tree and sawing the back. You got to be able to figure out your ground and lay out a strip, so that you save the timber the best you can according to how the ground is…The quality of cutters and all workers, they hired a lot of guys that were just green, never been in the woods before in their life…but falling timber takes a long time to do it right. It was bad (Interview #7, former PL employee, 2015).

In light of the takeover by Maxxam, PL employees shared similar fears for their future. Many felt that they could not voice their concern or even opposition to the Maxxam method and rate of timber harvesting because they feared the company would lay them off and threaten the future of their family’s livelihood. Some reacted by quitting before they had a chance to be fired and found employment elsewhere, others held on as long as they could. One stakeholder voiced this situation:

We knew that we were now working for somebody that said, “I believe in the Golden Rule and the one with the gold rules.” We knew we were working with somebody who cared only about money and not about people. It was more scarier times that’s for sure because of that. I think, like in most places, we just went on with business as usual. Most of us were raising families…Some people left right away and others of us, we stayed until we could leave. Then others just waited for the ax to hit them (Interview #10, former PL employee, 2015).

Another former employee of PL expressed a similar sentiment, citing that while they were making good money, they felt morally wrong about the way it was happening:

Well, you knew your time was limited. It was hard because they were throwing money at you. They gave us more money per thousand. Pretty much it was a free-for-all. You knew it was gonna end…you knew it wasn’t right…I didn’t feel right about what he was doing. In my position, I’m raising a family and stuff. It’s like here’s the work. If you want to work, work. You were kind of between a rock
and a hard spot…A lot of people were worried. A lot of people moved out of the area, I mean, completely out of the area…I remember people moving to different states and stuff like that, saying they could see what was happening and whatever, and they would leave (Interview #7, former PL employee, 2015).

Others voiced similar concerns such as, “I worked a lot of overtime which made me a lot more money which was nice in some ways but we know that it was a dead end street, that eventually we’d cut ourselves right out of a job…It’s just a lot of us were trapped into a lifestyle where we didn’t know how to get out of” (Interview #10, former PL employee, 2015). One stakeholder who is a forester and also an environmental activist shared an experience he had while conversing with PL employees during a protest via blockading logging roads:

It was really fun. It really was. I would sit there on the gate at 5:00 in the morning and talk to the timber fellers. I was the only one who had direct forestry training; I could sit there on the gate and say, “Let’s talk about selection versus clear cutting. Let’s talk about long term job prospects for you and your family and the next generation. Let’s talk about what Charles Hurwitz is doing to this. I’m aiding your industry.” “Well, why are you sitting on this gate then?” “Because I understand the bigger picture.” It would always end up that I would get somewhere until the picture of his little daughter came out. Then he’d go, “But I have to feed her.” I can’t tell you how any times that happened. How do you argue with the picture of his daughter? You don’t (Interview #16, forester/environmental activist, 2015).

While this wasn’t what all environmental activist interactions looked like with PL employees, it demonstrates how the environmental community was not solely focused on preserving old-growth redwood stands, rather, many were also advocates for workers’ rights. Through this hardship, however, there was a sense of comradery felt by PL employees: “it was a tough time, it was a tough time to be in the timber industry and a tough time to work for PL, but the, the employees, you know, we stuck together as
employees, because we were fighting for our livelihood” (Interview #12, former PL employee, 2015).

The events that conspired leading up to the deal and the creation of the Headwaters brought the community into national headlines. This had people saying things like, “It is crazy! When you think about it, little Fortuna, little Humboldt County, and you get this amazingly big issue” (Interview #12, former PL employee, 2015) and “the social atmosphere was terribly excited. There was protest and trespassing. There was vandalism…The atmosphere was crazy…It was a very interesting time to live through” (Interview #7, former PL employee, 2015). The media brought a lot of attention to the activism surrounding the preservation of the last and largest stand of privately-owned old-growth redwoods in the world, sharing the environmental community’s messages like “We wanted this last great redwood grove protected…Everybody knew it was the last of the last in private hands” (Interview #6, environmental activist, 2015). There were also opposing views on the significance of the Headwaters and its surrounding groves, “it’s an iconic stand because certain people made it into one, not because it really is a truly spiritual type of stand of redwood trees like we know exist in other places” (Interview #13, Humboldt Redwood Company employee, 2015).

The majority of interviewees agreed that the creation of the Headwaters was a political deal, and the national attention garnered in part by the environmental community added fuel to the fire. Preserving habitat for species dependent on old-growth forests like the Headwaters was the argument behind the drive to protect the redwoods. One former PL employee demonstrated this widespread view by saying,
From the science side of it and the protection of species side, it was...primarily about species like the marbled murrelet, but...lacking any species issues. People were still interested in just preserving these unentered forests and because the Headwaters...was the largest unentered stand that to date hadn’t been preserved; then that was the impetus to move towards the Headwaters deal (Interview #15, former PL employee, 2015).

Often the environmental community outside of Humboldt County was blamed for supporting a cause they were not intimate with. A former political leader in Fortuna describes it this way: “I think that that was the general community view, that the outsiders were causing trouble and trying to destroy the economy. I think that was the perception” (Interview #14b, former Fortuna political leader, 2015). Other stakeholders focused on the political nature of the deal: “Well, at the end of the day, it was politics. Because it had reached an acute point where Hurwitz...said, “Fix this thing.” The mythology, this image of this ephemeral thing called The Headwaters give it a name and it has a life the environmental groups had succeeded in creating this precious thing” (Interview #1, BLM employee, 2015) and

This was a multidimensional movement to try to protect this from being cut by Charles Hurwitz...There was the Rose Foundation doing the political stuff. There was EPIC doing the endangered species stuff. Earth First! was trying to slow it down and make headlines and get national media attention. It was the combination of all of those factors that actually got the complex that got all of the old growth protected, that was left. [PL] were cutting as hard as they could. This was not like, “Oh, we’ll just work out some political compromise.” The only reason the compromise happened was because activists put it on the line. It was a lot of work, by a lot of people (Interview #16, forester/environmental activist, 2015).

For some, it wasn’t a politics or the environment pushing them to support the creation of the Headwaters, it was the lack of support for Hurwitz and the effects that recent timber harvesting was having on adjacent neighboring lands. One neighbor expressed support
for the Headwaters, saying, “[I] lobbied for it to become a reserve. Not because I thought it was the end all thing that land should be, but because of the alternatives that were available, it was a better choice than leaving it in the hands Charles Hurwitz” (Interview #9, Headwaters neighbor, 2015).

Interviewees were diverse and colorful when reflecting on “the deal,” in which Hurwitz sold the Headwaters grove to the state and federal government in 1999. These few examples best represent the remarks I heard recurrently from interview participants: “Well, it was finalized in ’99. We all refer to it as The Headwaters Deal because it was a deal. It wasn’t a good deal for the public. It was a good deal for Charlie baby” (Interview #9, Headwaters neighbor, 2015), and

Came out good for Hurwitz, you see. He made more money on the deal than he did buying the whole company. You see…it’s like Watergate: follow the money and you can see what happened. You can see that his plan the whole time was just to get in here and get out as quick as possible. The only reason they took as long to get outta here as he did was cuz the tree-huggers and everybody showed up. The lawsuits jammed them a little bit...Plus, they got [the workers] all hyped up about hating hippies (Interview #17, former PL employee, 2015).

While the deal was a profitable arrangement for Hurwitz, much of the community was left feeling cheated and robbed of their future. A BLM employee reflected on what that era was like in the community:

There was a lot of really bad feelings around our community in the ‘90s, just a lot, and it made for a lotta turmoil. Maxxam, they were the best evil bad guys because they were owned by this Texas businessman, and this was a hostile takeover. It’s all that stuff happening, so it made them a great villain… Just the strife in this community was really...difficult, and people really took sides, and [if] somebody mentioned [it] in the store… and other people overheard it…there was tension. It was a lot of social strife...just living here during that was tough...The timber industry was all frightened (Interview #3, BLM employee, 2015).
After the Deal: Hardship and Challenges Felt By All

After the deal had been made and the BLM took over managing the Headwaters, many interviewees were relieved that the era was over. PL employees in particular were glad to be out of the spotlight, as one participant stated:

I think at that point when it was preserved it was kind of like, whew, done. This issue is done. This issue is done, done, done. We will get compensated, the public will have…their reserve, and … we can move on to commercial timber harvest on the rest of our property. Under strict restrictions…But, it was an issue that had been in the forefront for YEARS, and it was like, OK, let’s put this down. We still carry on the HCP and that’s gonna continue to be an issue but it’s not gonna really be in the public. So…we’ll still be dealing with the agencies, with the regulators, but in terms of the public and their outcry to get this forest protected, it is. (Interview #12, former PL employee, 2015).

As soon as the deal was finalized, the BLM was in charge of managing the Headwaters. It was instantly a popular place for the community, as they wanted to experience what they just purchased. A retired BLM employee remembers it like this:

Well, the first weekend I remember it being open. The environmentalists and the timber industry lined up out there at Elk River...It was touch and go. They just came to see what it was like and what it was about...[There] was just tension, and high energy, and we just let people mingle, and visit, but had law enforcement present, but not heavy matter. It just defused itself, but it was an interesting Saturday. From there I think the timber folks it was hard for them…that was their livelihood (Interview #11, retired BLM employee, 2015).

That same day, a PL employee went to visit the Headwaters and was asked by a BLM ranger about his opinion on the Headwaters: “She goes, ‘What do you think?’ I go, ‘It’s a disaster. That is good old growth. That’s a waste of money.’ I was pretty bitter then” (Interview #10, former PL employee, 2015). A few months later, he took his wife out to the Headwaters and she asked the same question, he said: “It was a lot of money to pay for that kind of timber land…a last ditch effort to save the clump of virgin old growth
from Charlie’s Ax pretty much. That’s what they were trying to do. They did. They succeeded. That’s fine. It’s worth it now that it’s done” (Interview #10, former PL employee, 2015). This was a common thread among former PL employees that I interviewed, as many expressed that while they opposed the deal for various reasons at the time it happened, they have since moved on and see value in the Headwaters grove for more than monetary profit. This sentiment did not hold true for every interviewee, however, as some were pleased to see habitat saved in perpetuity from the beginning. One interviewee expressed, “I think it’s a really, really special place, so it’s really super-important. I think in the whole world it’s really super-unique. There’s no other place like it, and I know that sounds corny, but…from an ecologist’s point of view, it’s like that’s how I see it” (Interview #3, BLM employee, 2015).

While the sense of relief swept the redwood coast as the battle over the Headwaters ended, the aftermath of such turmoil and resistance was still felt among the timber community of Fortuna. Overall, interviewees who had worked for PL felt like, “The Headwaters thing didn’t come out too good for the worker guys” (Interview #17, former PL employee, 2015). PL employees were frustrated at the amount of taxpayer money used to fund the purchase of the Headwaters, and felt like they were not compensated for their losses, as this interviewee stated: “I was very bitter at first because it took my job essentially. It shut down my head rig right after that. Put $480 million into Hurwitz’s pocket which was a way of repayment. Not all of it’s old growth. Part of it’s stumps” (Interview #10, former PL employee, 2015).
The idea of intergenerational transfer of knowledge was brought up by several interviewees. They expressed how the timber industry has historically been one where it is a family trade. Each member worked in the business, and whole families were supported by the same timber company for generations. With the controversy, increased regulation, and unstable work environment resulting from the decade leading up to the creation of the Headwaters, children no longer chose to go into the timber industry as their parents and grandparents had done. One member of the timber community described it this way:

The timber industry was…at least the largest private employer, but I think also, the largest single employer, the biggest source of jobs, and whole families worked in the timber industry. The grandfather started, and his son came in, and then his son or daughter…it was a multigenerational logging company and things like that. It was a big employer. There were lots of jobs. These are good paying jobs and not just out in the woods, but at the mills also. For those kids that didn’t want to or couldn’t afford to go off to college, they could get a good middle class job and live comfortably, so a pretty big deal for a small community (Interview #15, former PL employee, 2015).

Another timber industry employee referred to the idea that some of the timber community seemed to put on blinders when considering their future because PL was a family company and would always be there, “The problem was, the public couldn’t ask the appropriate questions. They were so wrapped up intergenerationally in the idea of forestry being there for them forever” (Interview #16, forester/environmental activist, 2015). With the sale of the Headwaters grove, PL also agreed to implement a HCP and Sustained Yield Plan on their remaining 211,000 acres of timberland. This increase in regulations for harvesting timber was tough for many employees to face, and was a
recurrent theme among the former timber workers I interviewed. One former PL employee who is employed by HRC today illustrated it like this:

Local residents were almost uniformly against increased forestry restriction. If you're a forester, if you're a logger, if you're an equipment operator, or even a mill hand, the more complex, the more restricted, the more difficult the planning and implementation process for timber management, the less timber comes in. The fewer jobs are available. Everybody sort of thought of it in those terms (Interview #4, former PL employee, 2015).

A forester practicing in the redwood region voiced similar concerns, espousing also that the deal brought with it increased regulations:

I was so sick and tired of all of the shit that was being shoveled down on me as a practicing forester in the redwood region by them trying to put the hammer down on Maxxam, that this deal that was crafted where Maxxam agreed to all of the stipulations of the HCP. It really dramatically changed how they were operating in the forest and the transfer of the Headwaters Forest as part of the deal. We were all optimistic that maybe things were gonna change, that this constant avalanche of rules and regulations was gonna slow down (Interview #13, HRC employee, 2015).

While this forester expressed brief optimism, it was not felt across all sectors of the forest products industry. In the years following this tumultuous change, some PL employees were facing layoffs, and the prosperity of a 140 year old company was threatened. A former PL employee representatively summed up many workers’ sentiments:

The deal didn’t work out. The Pacific Lumber Company, this 140 year old company was forced into bankruptcy. There were five sawmills. Now there’s only one. We had 1,500 employees and now the company has 300 employees… I had friends…and neighbors who lost their jobs. Some of them found another job and stayed. Other people had to leave the area. I never heard from them again (Interview #15, former PL employee, 2015).

Many in the community feared for the longevity of their job at PL. A BLM employee made it clear that you didn’t have to work at PL to understand the tough times
had by the employees: “I…definitely knew folks that were havin’ to switch jobs, tryin’ to find a job or havin’ to leave and being economically devastated with those jobs on the line. It was difficult” (Interview #3, BLM employee, 2015). One former PL employee and Fortuna resident spoke of how he chose to leave PL after the deal, an option many were afraid to undergo for fear of the future of their family’s livelihood:

I left, I was retrained and I went into heating, air conditioning and refrigeration. Four years later I didn’t like that and I went back to logging…I got laid off and…I found work after 14 months. I went driving bus for Transits Authority. Now I’m a bus driver…Me and my wife have three sons…We raised our boys here but none of our boys work in the timber industry and they don’t live around here either (Interview #10, former PL employee, 2015).

This quote also demonstrates the trend of diminishing multigenerational employment in the timber industry. PL employees experienced different levels of security with their job. Some interview participants argued that there was an inflated sense of job loss because so many new people were hired by Hurwitz in order to implement his new harvesting strategy effectively. A local forester summarized this by commenting that, “They brought in all these new people. That was one of the most interesting parts is that they’re like, “Oh, look at all these job losses. Well, it’s…because you’ve hired three times as many people as used to work in the woods here” (Interview #16, forester/environmental activist, 2015).

Amid all of the concern for longevity of jobs, the environment was facing a long process of restoration and recovery from years of intense timber harvesting practices. Neighbors and environmentalists alike reiterated the intensity of the effects of years of
logging near the Elk River watershed. This interview participant expressed how the deal would ideally help improve the impacts caused by past practices:

It was very important for protecting the water quality in Elk River here. However, all this residual in Elk River was all cut…There was a lot of it…just trashed, they got ten feet of sediment in Elk River…That’s a really big deal, which they weren’t getting that before at all. People’s places flooded that had never in history flooded (Interview #6, environmental activist, 2015).

Seventeen Years Later: A Community Still Divided.

At the time of this writing, the Headwaters had recently celebrated its 17th year as a public reserve. This does not mean that people are any less opinionated or passionate about its existence and place in the community. Some interview participants remained as opposed to the idea of the Headwaters as they were in the 1990s, as demonstrated by several interviewees, “The Headwaters Forest isn’t the answer” (Interview #14b, former Fortuna political leader, 2015), “It’s [created] a real loss of community” (Interview #9, Headwaters neighbor, 2015), and “Personally, I felt it was too much money and that I didn’t and I still don’t, feel that a lot of people can get there, or will go there. Serious. Serious access. Deep issues” (Interview #12, former PL employee, 2015). Some interview participants had polar opposite opinions of the Headwaters and have continually supported its purpose, like this interviewee states:

I think it’s a really good thing. I mean, I tell people this, and it sounds corny, but it’s like it’s unique in the world because…redwoods have a very limited distribution, and that old-growth grove at the heart of it is probably the most wild piece of redwoods left on the planet. I mean, it’s really pretty much undisturbed, and we took that one road out so it could heal, and very few people go in there. It’s really natural processes. It’s wild. It doesn’t have trails through it (Interview #3, BLM employee, 2015).
One of the main arguments that the environmental community advocated for during the 1990s was for the protection of an area much larger than that of present day Headwaters. While that goal never came to fruition, environmentalist interviewees still expressed a level of support for the Headwaters today. Two environmental activists accurately summarized this idea, “Did I support the creation of the Headwaters… the way it is now?…Not as the deal, but as what it is now, yeah, sure” (Interview #2, environmental activist, 2015), and “The fact that it exists at all is perhaps a miracle, so, again, thankful for that, but no…it did not come to fruition in the way we would have liked. Again, the fact that there’s anything there at all is perhaps surprising” (Interview #6, environmental activist, 2015). Overall, however, the majority of stakeholders fell somewhere in the middle, reflecting on how the timber wars and creation of the Headwaters are in the past and we should just move on. A former PL timber worker best summarized the overall feeling that interviewees expressed on this topic:

It’s been a generational impact on myself and everybody else… I’m glad it’s still part of our community. As far as the Headwaters, glad we got it behind us. Let’s see what we can do with what we have left and that kinda thing. I’d rather still really like to see the Headwaters itself develop more for public exposure because we paid a lot of money for it. Let’s try to get some revenue (Interview #5, former PL employee, 2015).

This interviewee demonstrates willingness to move past the event and look to the future of what the Headwaters can bring to the community of Fortuna.
Fortuna and Its Big Backyard: How Do We Get To the Headwaters?

The creation of the Headwaters stemmed from the need for marbled murrelet habitat protection. If human activity occurs in these stands, there is an increased potential for corvid activity, which prey on marbled murrelet eggs and chicks, threatening the future of marbled murrelet populations (Nelson and Hamer, 1995). To counteract this, the BLM has limited access through old-growth stands at the Headwaters, with the largest stand or “the heart” completely off-limits to public access. Several interview participants were in agreement that the longevity of this habitat should be the number one priority, and these quotes accurately represent this feeling: “I personally think of it as a refuge for murrelets. That was why they spent all that money for it, and I think it makes the most sense, and I’m glad they have controlled access” (Interview #16, forester/environmental activist, 2015), and

Critical habitat designation overlay for marbled murrelets on the forest itself is very problematic for expanding uses. That's gonna constantly hinder what can be done with that forest, and should something become kinda contemplated. Whoever comes up with the idea is gonna have this other faction of don’t do anything. We want that as a natural reserve. People don’t belong there. That’s the two tensions (Interview #13, HRC employee, 2015).

Others were not as keen on the idea of complete public exclusion and would like to see more opportunities for the public to experience the old-growth. A former PL employee reflected:

The murrelet alone was not enough reason for us to spend that money, in my view. I wanted to see a place where I could go and tell my family, "I was part of this process." Or enjoy with my kids. Hikes through old-growth that are awesome and accessible. I came to learn that's just not the kind of place it is…. You either see it or you don't, but that's the one to focus on, and that's the habitat value. Is it doing some good biologically? (Interview #4, former PL employee, 2015).
Most interview participants stated that access was the biggest barrier to community visitation and involvement at the Headwaters, and that residents want to see value for their investment by visiting the old-growth redwood stands. While some didn’t see this as a big issue, making comments such as, “There’s very little access to it, which I don’t think is a bad thing, really” (Interview #16, forester/environmental activist, 2015), most of the others were more inclined to express their views along the lines of this participant: “Get us to some aspect of the Headwaters where you can see the beauty…Give people a chance to say they've been there. Make that billion-dollar deal worthwhile” (Interview #4, former PL employee, 2015). Another Fortuna resident expressed a need for increased income opportunities for the Headwaters: “To get as much profit out of it as possible, to enhance it for more people to enjoy it, I guess, would be the best thing” (Interview #7, former PL employee, 2015). To increase income, however, the consensus was that access would need improvement. As it stands, the public can only visit the Headwaters from two access points, one in Eureka and one in Fortuna. The Fortuna (southern) access point is by guided hike only, and as this interview participant succinctly stated, “Unless there’s some kind of access…from the south…there’s no real tourism benefit, and there’s no real economic benefit” (Personal communication, former Fortuna political leader, 2015). While guided access does exist from the south, visitors must drive through a private locked gate up several miles of logging road in order to reach the trailhead.
Although access is the major issue restricting use of the Headwaters via Fortuna, many interview participants still argued that Fortuna could be doing more in the way of marketing their community as the gateway to the Headwaters. One interview participant stepped into the shoes of Fortuna’s mayor for a moment and posited, “What I would do if I were mayor of Fortuna? Gateway to Headwaters. Museum, a logging museum that actually told the story…I’d have tons of pictures. I’d have a whole deal about the redwoods. I’d make it all about the redwoods and I’d advertise it internationally” (Interview #8, environmental activist, 2015). Stakeholders were imaginative when postulating the ways in which Fortuna could advertise their connection to the Headwaters, “I mean, the backpackers and the naturalists, the birdwatchers, the flower people, and the people who love big trees. I mean, Fortuna, I think, could transform itself” (Interview #6, environmental activist, 2015). Another idea echoed throughout the interviews was surrounding the idea that more visitor service facilities were needed in order to improve visitation, as expressed by this participant:

Once you get up there, we may need some visitors service facilities to get people in, superficially to enjoy the Headwaters…Because you don't have to develop 7,000 acres. Develop ten. Give people a picnic park after all…Figure out ways for them to rest on their way up, and make it accessible to as many people as possible (Interview #4, former PL employee, 2015).

While still opinionated about the topic, interview participants seemed to agree that public controversy over the Headwaters has slowed and the community is gradually forgetting or even accepting this event that transpired in local history. A BLM employee summed up this feeling well:
It was amazing to me…once it was created…we had all these people go out there….People from all over came…and a year or so later it almost seemed to me like the timber wars were over, I mean, from a community-member perspective. Just the battle had been fought. It’d been won, or at least there was enough of a settlement there that there wasn’t enough worth fighting over anymore, and things really calmed down in our community, and we really got to work on doing good things (Interview #3, BLM employee, 2015).

Looking forward, the BLM has a positive outlook on how they can work with the community to restore the Headwaters. As this employee says, from the beginning of their management, the BLM has focused on hiring locally and would like to see this continued as more restoration is done at the Headwaters:

One of the greatest things I think we did as an agency was with the restoration. Is that we didn’t take that money and hire a staff to do that work. We put that money back out in the community, so…displaced timber workers did the restoration work. Our main operator out there….at one point, worked for PL and built those roads. Now he takes those roads out….All the dump trucks, all the heavy equipment came from the community, so it was used locally. There were quite a few people that were able to go back to work (Interview #11, BLM employee, 2015).

This was a win-win for the BLM and the community members hired to complete restoration work, as the BLM was able to hire within the community and did not have to outsource the work. While this has proven to benefit the relationship between the BLM and the community, it should be noted only a few community members have been employed by the BLM to do this type of work.

Even though Fortuna is the closest community to the Headwaters, almost half of Fortuna residents have never visited, and interview participants expressed similar thoughts such as “I don’t think too many people…that live in Fortuna really even think about the Headwaters anymore” (Interview #10, former PL employee, 2015). Some
Interview participants argued to keep the Headwaters with limited access and low visitation, like this ecologist stated:

The underlying purpose of it isn’t like a state park…Every time Sunset magazine says, “Visit the least-crowded national parks,” they list Redwood National Park. It’s not overrun with visitors…It wasn’t like, “We need another park for people to go to.” The parks aren’t even at whatever capacity is. It’s not [that] they’re overflowing with people. It’s not that there’s a shortage of opportunities to go see big redwoods. You wanna go see big redwoods, there’s bigger ones, more-accessible ones right down the road (Interview #3, BLM employee, 2015).

Interview participants expressed potential for future income generation with improved access to the Headwaters, but did not demonstrate any direct benefit flows occurring presently from the Headwaters. As this forester states,

What immediately struck me is how difficult it is to access the Headwaters from, really, anywhere. It’s isolated. People’s enjoyment would be enhanced if…[there was] better access provided, especially for the people of Fortuna, to expand the enjoyment to a broader sector of the people in Fortuna (Interview #13, HRC employee, 2015).

These quotes demonstrate that the people of Fortuna have disparate and sometimes conflicting ideas about access, and that it is a fruitful area of conversation going forward.

Quantitative Results: Survey

I distributed 646 surveys and received a total of 260 completed surveys from residents of Fortuna, California. This is a response rate of 40%4. Of the completed surveys, 253 were completed using the English version of the survey (97%) and 7 were

4 All percentages presented in results are valid percentages, which exclude missing responses. N values represent the total number of valid responses for each question.
completed using the Spanish version of the survey (3%). Ninety percent (90%) of survey participants opted to complete the survey at a later time and return it via the prepaid return envelope provided. A total of 85 residents (13%) filled out the contact card and expressed willingness to be interviewed at a later time. Of these, only 3 (0.5%) were selected to participate in the interview process. Because the process for selecting interview participants was purposive, it did not require a large sample size from the pool of survey participants. Survey participants were selected to be interviewed based off of my personal interaction with them and my understanding of their depth of knowledge of the process surrounding the creation of Headwaters. By selecting only a few survey participants to be interviewed, we ensured that the perspective of Fortuna residents with ties to PL was demonstrated and highlighted in the interview data.

**Demographics**

The mean length of time that survey participants have lived in Fortuna was 21.79 years, with the lowest length of residency at 0 years and the highest at 80 years. The mean age of survey participants was 56 years old (Table 1). The highest number of participants belonged to the 56-65 year old age group (25%). The age group represented by the fewest number of participants was for those 18-25 years old (7%). The youngest person to participate was 18 years old, and the oldest participant was 91 years old.
Table 1: Age Groups for Survey Participants (n=253)

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Participants (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-25</td>
<td>7</td>
</tr>
<tr>
<td>26-35</td>
<td>12</td>
</tr>
<tr>
<td>36-45</td>
<td>10</td>
</tr>
<tr>
<td>46-55</td>
<td>11</td>
</tr>
<tr>
<td>56-65</td>
<td>25</td>
</tr>
<tr>
<td>66-75</td>
<td>20</td>
</tr>
<tr>
<td>76 and older</td>
<td>15</td>
</tr>
</tbody>
</table>

The majority (57%) of survey participants were female, and 43% were male. Men 56-65 were the most represented demographic to participate in this survey (Figure 5).

Figure 5: Total participation broken down by gender and age (n=253).

Seventy-nine percent (79%) of survey participants had completed at least some college education (Figure 6).
We asked participants about their level of community involvement in a variety of interest areas (Table 2). Three percent (3%) of those surveyed indicated that they belonged to a hiking club or organization, 9% belonged to sportsman groups or organizations, 7% were involved with conservation or environmental organizations, and 7% were with a historical or cultural group or organization. We also asked if participants belonged to any other groups that were not listed. Fourteen percent (14%) responded and stated involvement with groups including various philanthropic or community service groups, religious organizations, volunteer fire departments, Fortuna Chamber of Commerce, and the Fortuna Senior Center.
Table 2: Community involvement in various groups and organizations, expressed as percent.

<table>
<thead>
<tr>
<th>Community Involvement</th>
<th>Participants Who Belong (%)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hiking clubs or organizations</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Sportsman groups or organizations</td>
<td>9</td>
<td>22</td>
</tr>
<tr>
<td>Conservation or environmental organizations</td>
<td>7</td>
<td>18</td>
</tr>
<tr>
<td>Historical/cultural groups or organizations</td>
<td>7</td>
<td>19</td>
</tr>
<tr>
<td>Other</td>
<td>14</td>
<td>35</td>
</tr>
</tbody>
</table>

Visiting the Headwaters Forest Reserve

Visitation to Specific Areas of the Headwaters.

Forty-nine percent (49%) of survey participants had never visited the Headwaters. Thirty-three percent (33%) of survey participants had visited the Salmon Pass Trail at the Headwaters, and the majority (81%) said they visited this trail 1-2 times per year or fewer. The Elk River Trail is frequented more than the Salmon Pass Trail, as 40% had visited the Elk River Trail. The majority of users (77%) visited the Elk River Trail 1-2 times per year or fewer. The Headwaters Education Center (HEC) is located on the Elk River Trail and 27% of participants reported having visited it. These users visit the HEC primarily 1-2 times per year or fewer (86%). Participants were asked if they visited other areas of the Headwaters not designated on the survey, and 10% said that they had. The majority of these users (68%) stated they visit other areas in Headwaters 1-2 times per year or fewer. Examples of other locations included “the trail at the end of Newburg Road in Fortuna” and “visited Headwaters before it was a preserve.”
Activities at the Headwaters.

Participants were asked what activities they engaged in when visiting the Headwaters (Figure 7). Only those who had visited the Headwaters were asked to answer this question (n=127). The most popular activities visitors engaged in while visiting the Headwaters were hiking (61%), spending time with family (60%), spending time with friends (54%), wildlife viewing (39%), dog walking (30%), and photography (28%). Other visitor activities while visiting the Headwaters included spending time alone (22%), nature study (22%), history or cultural study (20%), biking (10%), public events such as living history tours (6%), working (5%), volunteering (4%), wheelchair use (2%), geocaching (1%), Redwood EdVentures Quest Program (1%), and other activities (11%). Responses for “other activities” included working on adjacent timberlands, participating in school class field trips, and worked there before it was the Headwaters and still owned by PL.
Figure 7: Number of participants who participated in various activities at the Headwaters during one or more of their visits.

**Scenarios That May Increase Headwaters Visitation.**

Survey participants were asked what would increase their likeliness to visit the Headwaters (Figure 8). Each situation provided was hypothetical and was not meant to suggest any future planning by the BLM at the Headwaters. Fifty-five percent (55%) of respondents indicated that their visitation to the Headwaters could increase if a trail completely connected Fortuna with the existing Salmon Pass Trail at the Headwaters.
Vehicle access from Fortuna to the Salmon Pass Trail came in second, with 48% of participants stating that this could increase their visitation to Headwaters. These were by far the most popular scenarios selected by participants. If an informational booth were placed near Fortuna, 39% of participants stated that their likelihood to visit Headwaters would increase. Thirty-eight percent (38%) of participants might visit Headwaters if there were more tours and public events offered there. Currently, hikes on the Salmon Pass Trail are only offered with a guide, and 35% of participants stated they may visit Headwaters more if unguided hikes were permitted on that trail. Twenty-nine percent (29%) indicated that they may visit more if dogs were allowed on the Salmon Pass Trail.

If more educational opportunities were offered at Headwaters, 25% of survey participants stated that this may increase their likelihood to visit. Eighteen percent (18%) of participants indicated that if there were more ADA accessible trails at Headwaters, their likelihood to visit would increase. If mountain bike riding opportunities increased at Headwaters, 17% of participants said their likelihood to visit would increase. As with many of the questions in this survey, participants were asked if there were any other scenarios not listed that would increase their visitation at Headwaters. Eight percent (8%) included a scenario for the “other” option, and ideas included the following: accessibility for equestrian riding, shorter trails that still have old-growth redwood viewing opportunities, a fun-run event, more advertisement in the local community about events held at Headwaters and how to access the Headwaters, off-highway vehicle access, and increased infrastructure such as picnic areas and toilets.
Activities When Visiting Other Public Lands

Survey participants were asked to rate the desirability of certain activities when they visit any public forest, park, or land (Table 3). Overall, participants found hiking, spending time with family and friends, and wildlife viewing to be the most desirable activities to partake in when visiting public lands. The least popular activities for
participants visiting public lands were participating in docent-led (guided) hikes, geocaching, working, volunteering, biking, and wheelchair use.

Table 3: Desirability of participating in activities when visiting any public forest, park, or land.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Desirable</th>
<th>Neutral</th>
<th>Undesirable</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hiking on trails</td>
<td>74</td>
<td>17</td>
<td>10</td>
<td>232</td>
</tr>
<tr>
<td>Participating in a docent-led (guided)</td>
<td>26</td>
<td>30</td>
<td>45</td>
<td>210</td>
</tr>
<tr>
<td>Hike</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spending time alone</td>
<td>50</td>
<td>22</td>
<td>28</td>
<td>219</td>
</tr>
<tr>
<td>Spending time with family</td>
<td>82</td>
<td>11</td>
<td>6</td>
<td>232</td>
</tr>
<tr>
<td>Spending time with friends</td>
<td>81</td>
<td>12</td>
<td>7</td>
<td>226</td>
</tr>
<tr>
<td>Nature study</td>
<td>45</td>
<td>26</td>
<td>29</td>
<td>220</td>
</tr>
<tr>
<td>History or cultural study</td>
<td>46</td>
<td>28</td>
<td>27</td>
<td>218</td>
</tr>
<tr>
<td>Wildlife viewing</td>
<td>73</td>
<td>14</td>
<td>13</td>
<td>224</td>
</tr>
<tr>
<td>Photography</td>
<td>53</td>
<td>24</td>
<td>23</td>
<td>211</td>
</tr>
<tr>
<td>Geocaching</td>
<td>16</td>
<td>17</td>
<td>66</td>
<td>161</td>
</tr>
<tr>
<td>Dog walking</td>
<td>45</td>
<td>19</td>
<td>36</td>
<td>213</td>
</tr>
<tr>
<td>Wheelchair use</td>
<td>35</td>
<td>17</td>
<td>48</td>
<td>178</td>
</tr>
<tr>
<td>Biking</td>
<td>32</td>
<td>24</td>
<td>45</td>
<td>191</td>
</tr>
<tr>
<td>Working</td>
<td>21</td>
<td>22</td>
<td>57</td>
<td>159</td>
</tr>
<tr>
<td>Volunteering</td>
<td>23</td>
<td>26</td>
<td>52</td>
<td>165</td>
</tr>
</tbody>
</table>

Perceptions of Headwaters Forest Reserve

Support for Headwaters.

Sixty-one percent (61%) of respondents agreed or agreed strongly that they will likely visit Headwaters in the future (Figure 9). A total of 23% of respondents stated that they disagree or strongly disagree with the same statement. Sixteen percent (16%) were neutral on the topic.
Survey participants were asked about the extent to which they agreed with statements regarding their overall support for Headwaters in 1999 and 2015. Non-parametric tests (Kendall’s tau-b and Spearman’s rank-order) were run to understand the relationship between support for Headwaters in 2015 and support for Headwaters in 1999 against the following variables: length of time living in Fortuna, age, gender, and education level (Table 4).
Table 4: Non-parametric test results for support for Headwaters today and in 1999 against length of time living in Fortuna, age, gender, and education.

<table>
<thead>
<tr>
<th>Variable 1</th>
<th>Variable 2</th>
<th>Kendall's Tau-b Results</th>
<th>Spearman's Rank-Order Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support for HFR in 1999</td>
<td>Length of time living in Fortuna</td>
<td>$\tau_b = -0.074$, $p = 0.197$</td>
<td>$rs = -0.099$, $p = 0.195$</td>
</tr>
<tr>
<td>Support for HFR in 2015</td>
<td>Length of time living in Fortuna</td>
<td>$\tau_b = -0.136$, $p = 0.009^*$</td>
<td>$rs = -0.180$, $p = 0.008^*$</td>
</tr>
<tr>
<td>Support for HFR in 2015</td>
<td>Age</td>
<td>$\tau_b = -0.143$, $p = 0.005^*$</td>
<td>$rs = -0.190$, $p = 0.005^*$</td>
</tr>
<tr>
<td>Support for HFR in 1999</td>
<td>Age</td>
<td>$\tau_b = -0.027$, $p = 0.637$</td>
<td>$rs = -0.039$, $p = 0.612$</td>
</tr>
<tr>
<td>Support for HFR in 1999</td>
<td>Gender***</td>
<td>$\tau_b = 0.124$, $p = 0.072$</td>
<td>$rs = 0.137$, $p = 0.072$</td>
</tr>
<tr>
<td>Support for HFR in 2015</td>
<td>Gender***</td>
<td>$\tau_b = 0.234$, $p = 0.000^{**}$</td>
<td>$rs = 0.254$, $p = 0.000^{**}$</td>
</tr>
<tr>
<td>Support for HFR in 1999</td>
<td>Education</td>
<td>$\tau_b = 0.141$, $p = 0.027^*$</td>
<td>$rs = 0.166$, $p = 0.028^*$</td>
</tr>
<tr>
<td>Support for HFR in 2015</td>
<td>Education</td>
<td>$\tau_b = 0.114$, $p = 0.047^*$</td>
<td>$rs = 0.133$, $p = 0.048^*$</td>
</tr>
<tr>
<td>Support for HFR in 1999</td>
<td>Support for HFR in 2015</td>
<td>$\tau_b = 0.655$, $p = 0.000^{**}$</td>
<td>$rs = 0.721$, $p = 0.000^{**}$</td>
</tr>
</tbody>
</table>

* Significant at the $p < 0.05$ level  
** Significant at the $p < 0.001$ level  
*** Value for Men=1, Women=2

Survey participants were asked if they had supported the creation of Headwaters in 1999 (Figure 10). Thirty-seven percent (37%) of respondents disagreed or strongly disagreed with the statement “I supported the creation of the Headwaters Forest Reserve in 1999.” Only 15% of respondents expressed neutrality on the topic, and the majority (48%) of respondents agreed with the statement. Participants were also asked if they are supportive of Headwaters in 2015 (Figure 11). An overwhelming majority (70%) agreed
or strongly agreed with the statement. A total of 13% of survey respondents were neutral about their current level of support, and 17% individuals disagreed or strongly disagreed with the statement.

Figure 10: Participants responses to the statement “I supported the creation of the Headwaters Forest Reserve in 1999,” expressed as percent (n=177).

Figure 11: Participants views in response to the statement "I am supportive of the Headwaters Forest Reserve today," expressed as a percent (n=223).
I tested the relationship between participants’ support for Headwaters, both in 1999 and 2015, and the length of time they had lived in Fortuna. I ran a Kendall’s tau-b correlation Spearman’s rank-order correlation on the data. Results indicate that the correlation between support in 1999 and length of residency in Fortuna is not statistically significant (Kendall’s tau-b: $\tau_b = -0.074, p = 0.197$; Spearman’s rank-order: $r_s = -0.099, p = 0.195$). However, results indicate that there is a statistically significant relationship between support for Headwaters in 2015 and the length of time participants had resided in Fortuna (Kendall’s tau-b: $\tau_b = -0.136, p = 0.009$; Spearman’s rank-order: $r_s = -0.180, p = 0.008$). Residents who have been living in Fortuna for a longer time had lower levels of support for Headwaters in 2015.

To gain an understanding of the relationship between support for Headwaters, both in 1999 and 2015, and age, I ran a Kendall’s tau-b correlation and a Spearman’s rank-order correlation on the data. The relationship between participants support for Headwaters in 1999 and age is not statistically significant (Kendall’s tau-b: $\tau_b = -0.027, p = 0.637$; Spearman’s rank-order: $r_s = -0.039, p = 0.612$). Conversely, the relationship between participants support in 2015 and age is statistically significant (Kendall’s tau-b: $\tau_b = -0.143, p = 0.005$; Spearman’s rank-order: $r_s = -0.190, p = 0.005$). Older participants demonstrated less support for Headwaters in 2015 than younger participants.

I ran a Kendall’s tau-b correlation and a Spearman’s rank-order correlation to understand the relationship between age and support for Headwaters in 1999 for participants that were over the age of 18 in 1999 when Headwaters was established. It does not have a statistically significant relationship. This is the same result as when these
tests were performed for all survey participants. I also ran a Kendall’s tau-b correlation and a Spearman’s rank-order correlation to understand the relationship between age and support for Headwaters in 2015 for participants that were over the age of 18 in 1999. This relationship is not statistically significant. This is different than when the test was run on all of the participants (no matter what age or length of residency) where “older participants demonstrated less support for Headwaters in 2015 than younger participants” and the relationship was statistically significant.

In order to understand what the relationship was between support for Headwaters, both in 1999 and 2015, and gender, I performed a Kendall’s tau-b correlation and Spearman’s rank-order correlation to test the data. The results indicate that the relationship between support for Headwaters in 1999 and gender is not significant (Kendall’s tau-b: $\tau_b = 0.124, p = 0.072$; Spearman’s rank-order: $r_s = 0.137, p = 0.072$), and the results align with the Kendall’s tau-b test ($r_s = 0.137, p = 0.072$). However, there is a significant relationship between support for Headwaters in 2015 and gender (Kendall’s tau-b: $\tau_b = 0.234, p = 0.000$; Spearman’s rank-order: $r_s = 0.254, p = 0.000$). When participants were asked about their support for Headwaters in 1999, there was no significant difference between men and women. When asked about their support for Headwaters in 2015, women demonstrated significantly higher levels of support.

A Mann-Whitney U test was run to determine if there were differences in levels of support for Headwaters in 1999 between males and females. Distributions of levels of support for males and females were similar, as assessed by visual inspection. The median level of support was not statistically significantly different between males (Mdn. = 3) and
females (Mdn. = 4), $U = 4,406, z = 1.801, p = 0.072$. I also ran a Mann-Whitney U test to determine if there were differences in levels support for Headwaters in 2015 between males and females. Distributions of the levels of support for males and females were not similar, as assessed by visual inspection. The level of support for males (mean rank = 94.35) was statistically significantly lower than for females (mean rank = 124.51), $U = 7,687, z = 3.768, p < 0.005$.

I tested the relationship between participants’ support for Headwaters, both in 1999 and 2015, and education, by performing Kendall’s tau-b correlation and Spearman’s rank-order correlation tests on the data. Results indicate that the relationship between support for Headwaters in 1999 and education level is statistically significant (Kendall’s tau-b: $\tau_b = 0.141, p = 0.027$; Spearman’s rank-order: $rs = 0.166, p = 0.028$). When testing the relationship between support for Headwaters in 2015 and education, the results also indicate that a statistically significant relationship exists (Kendall’s tau-b: $\tau_b = 0.114, p = 0.047$; Spearman’s rank-order: $rs = 0.133, p = 0.048$). Participants with higher levels of education demonstrated more support for Headwaters both in 1999 and 2015.

I conducted a chi-square analysis to test the relationship between support for Headwaters in 1999 and 2015, and it showed that there is a significant relationship ($X^2 (16, N = 170) = 179.737, p = .000$). Further analysis using a Kendall’s tau-b test and Spearman’s rank order correlation test provide additional evidence for support for the chi-square test results (Kendall’s tau-b: $\tau_b = 0.655, p = 0.000$; Spearman’s rank-order: $rs = 0.1721, p = 0.000$). Participants who demonstrated higher levels of support in 1999 showed similar levels of support for Headwaters in 2015.
Participants were asked to rate their level of satisfaction with the current management at Headwaters (Figure 12). Only half (52%) of all survey respondents chose to answer this question. Of those who answered, 45% agreed or strongly agreed with the statement expressing satisfaction with the current Headwaters management. Thirty-two percent (32%) expressed neutral views on the topic, and 24% disagreed or strongly disagreed with the provided statement.

![Participants Satisfaction with the Current Management at Headwaters](image)

Figure 12: Participants responses to the statement “I am satisfied with the current management at the Headwaters Forest Reserve,” expressed as percent (n=135).

Perceptions of Headwaters Benefits

Survey participants were asked to indicate their level of support for nine statements regarding the potential and actual community, environmental, and economic benefits provided by Headwaters (Table 5). For all but one statement, “The HFR positively contributes to the economy of Fortuna,” the majority of respondents agreed with each statement.
Table 5: Survey Participants Level of Agreement for Statements Regarding the Community, Environmental, and Economic Benefits of Headwaters (HFR = Headwaters Forest Reserve).

<table>
<thead>
<tr>
<th>Statement</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>The HFR increases the desirability of Fortuna as a place to live</td>
<td>24</td>
<td>22</td>
<td>54</td>
<td>196</td>
</tr>
<tr>
<td>The HFR contributes to the distinctive community atmosphere and/or pride of Fortuna</td>
<td>28</td>
<td>19</td>
<td>53</td>
<td>199</td>
</tr>
<tr>
<td>The HFR protects natural landscapes and views</td>
<td>10</td>
<td>15</td>
<td>76</td>
<td>220</td>
</tr>
<tr>
<td>The HFR protects native fish, wildlife, and plant habitat</td>
<td>7</td>
<td>13</td>
<td>80</td>
<td>216</td>
</tr>
<tr>
<td>The HFR provides an opportunity for the public to learn about local history, culture, and/or natural world around Fortuna</td>
<td>15</td>
<td>21</td>
<td>65</td>
<td>219</td>
</tr>
<tr>
<td>The HFR provides a place of refuge from the busy world</td>
<td>11</td>
<td>16</td>
<td>73</td>
<td>213</td>
</tr>
<tr>
<td>The HFR increases local tourism revenue and appeal</td>
<td>22</td>
<td>23</td>
<td>55</td>
<td>189</td>
</tr>
<tr>
<td>The HFR positively contributes to the economy of Fortuna</td>
<td>33</td>
<td>25</td>
<td>42</td>
<td>173</td>
</tr>
<tr>
<td>The HFR contributes to the livability and charm of Fortuna</td>
<td>24</td>
<td>22</td>
<td>55</td>
<td>203</td>
</tr>
</tbody>
</table>

Fifty-four percent (54%) of respondents agreed or strongly agreed that Headwaters increases the desirability of Fortuna as a place to live (Figure 13).
When asked if Headwaters contributes to the distinctive community atmosphere and/or pride of Fortuna, 53% of respondents said they agreed or strongly agreed (Figure 14).

Figure 13: Participants responses to the statement “The HFR increases the desirability of Fortuna as a place to live,” expressed as percent (n=196).

Figure 14: Participants responses to the statement “The HFR contributes to the distinctive community atmosphere and/or pride of Fortuna,” expressed as percent (n=199).
A majority of respondents (53%) also strongly agreed that Headwaters protects natural landscapes and views (Figure 15).

Figure 15: Participants responses to the statement “The HFR protects natural landscapes and views,” expressed as a percent (n=220).
Participants were just as much in agreement with the statement referencing Headwaters’ protection of native fish, wildlife, and plant habitat (Figure 16). Fifty-four percent (54%) strongly agreed with the statement.

![Participants Level of Support for the Statement: "The HFR protects native fish, wildlife, and plant habitat."](image)

Figure 16: Participants responses to the statement “The HFR protects native fish, wildlife, and plant habitat,” expressed as a percent (n=216).
When asked if Headwaters provides an opportunity for the public to learn about local history, culture, and/or the natural world around Fortuna, 65% stated that they agreed or strongly agreed (Figure 17).

![Participants Level of Support for the Statement: "The HFR provides an opportunity for the public to learn about local history, culture, and/or natural world around Fortuna."

Figure 17: Participants responses to the statement “The HFR provides an opportunity for the public to learn about local history, culture, and/or natural world around Fortuna,” expressed as a percent (n=219).
There was very little disagreement when participants were asked if Headwaters provides a place of refuge from the busy world (Figure 18). Only 11% stated that they disagreed or strongly disagreed with the statement, and an overwhelming 73% stated they agreed or strongly agreed.

Figure 18: Participants’ responses to the statement “The HFR provides a place of refuge from the busy world,” expressed as a percent (n=213).
Fifty-five percent (55%) of survey respondents agreed or strongly agreed that Headwaters increases local tourism revenue and appeal (Figure 19).

Figure 19: Participants responses to the statement “The HFR increases local tourism revenue and appeal,” expressed as a percent (n=189).
When asked if Headwaters positively contributes to the economy of Fortuna, respondents expressed the most disagreement than with any other statement regarding their perceptions about Headwaters benefits (Figure 20). Only 42% expressed agreement with the statement, and 33% stated that they disagree or strongly disagree.

Figure 20: Participants responses to the statement “The HFR positively contributes to the economy of Fortuna,” expressed as a percent (n=173).
Lastly, the majority of respondents (55%) agreed or strongly agreed with the statement indicating that Headwaters contributes to the livability and charm of Fortuna (Figure 21).

![Participators Level of Support for the Statement: "The HFR contributes to the livability and charm of Fortuna."

Figure 21: Participants’ responses to the statement “The HFR contributes to the livability and charm of Fortuna,” expressed as a percent (n=203).
DISCUSSION

Community Support for and Perceptions of the Headwaters Has Changed Over Time

This study shows that the creation of the Headwaters was a solution to a political problem; however public opinion on the inherent value of the Headwaters varied greatly. Environmental activists touted the Headwaters grove as the last and the largest privately held stand of unentered redwoods in the world, iconizing the grove and causing an influx of activists to Humboldt County to “save the redwoods.” Others viewed it as an opportunity for a maligned outsider-investor, Charles Hurwitz, to capitalize on an asset and inflate his fortune, and did not feel that the Headwaters grove deserved as much environmental protection as was designated. Underlying this debate, the Headwaters grove was critical habitat for the federally listed marbled murrelet, and in order for this habitat to be preserved in perpetuity, it had to be purchased from Hurwitz. The solution to this environmental issue was ultimately a political deal that cost the taxpayers $380 million for the protection of the Headwaters grove. The level of support interview participants expressed for the Headwaters can be explained by the way in which they perceive the purpose of its creation. Those who did not support the creation of Headwaters often attributed it to Hurwitz’s attempt to capitalize on the old-growth redwoods. In contrast, those who supported its creation often looked at it from an ecological standpoint, seeing the Headwaters as a necessity for the preservation of the marbled murrelet.
Community support for and perceptions of the Headwaters varies across age, gender, education level, and length of residency for Fortuna residents. As age and length of residency of Fortuna residents increase, current support for the Headwaters decreases. As reported by survey respondents, support for the Headwaters in 1999, the year the Headwaters was formally established, was lower than support is today. The case of Fortuna and the Headwaters continues to be a source of ongoing conflict for some, but we can see that many softened their perspective and moved on as time passed by. The survey data demonstrate that certain older and more established community members expressed more reluctance to support the Headwaters both in 1999 and today. But many seem to have recovered from past hardship, choosing to look forward and no longer harbor feelings of animosity like they experienced at the time of the creation of the Headwaters.

Many rural communities are highly dependent upon forest resources to maintain their livelihoods (Mamo et al., 2007). When there is a shift from timber production to environmental protection, social, economic, and psychological impacts can be negative, affecting workers in the timber industry and their community, challenging rural communities to maintain their livelihood (Charnley et al., 2008; Mamo et al., 2007). The case of the Northwest Forest Plan, a forest management policy in the Pacific Northwest that reallocated roughly 11.6 million acres of federal land in the Pacific Northwest from commodity production to biodiversity services, provides an example of how communities’ socioeconomics are affected with land designation changes (Charnley et al., 2008). When exploring the ways in which forest dependent communities were
affected by the Northwest Forest Plan, Charnley et al. (2008) states that some of the negative effects can stem from “reduced job security and benefits; declining wages and occupational status; the breaking of social bonds held with other workers, the firms that employed them, and their communities; the stress of having to relocate; and the loss of occupational identity as a way of life” (p. 747).

Similarly to the communities directly affected by the Northwest Forest Plan, the community of Fortuna depended on the land comprising present day Headwaters for industrial forestry and employment opportunities. The creation of Headwaters was a result of a political issue that stood for much more than the loss of 7,472 acres of productive timberland, which would have only made a short term difference in Fortuna’s economy at the time. Rather, this change from commodity-producing land to federally-protected land was symbolic of deeper changes, including the decline of timber-related employment in the region. But it also presented Fortuna with the opportunity to demonstrate community resiliency during and following this difficult transition. As Magis (2010) points out, in order for communities to thrive and become resilient, they must learn to live with change and uncertainty and strategically develop resilience through planning, collective action, innovation, and learning. As indicated through the interviews, Fortuna is adapting and learning to live with this change that happened in their community. As community perspectives on Headwaters soften, members are quick to postulate ideas for economic growth which include ways to increase tourism and improve advertising of the forest reserve in their backyard, though ideas for access to the land differ. Demonstrated through a small but committed group of Headwaters
volunteers, community members are engaging with each other to participate in activities at Headwaters and raise awareness of the place. Fortuna is demonstrating qualities of community resilience and is growing stronger as time passes by and the memory of the events leading up to the creation of Headwaters fades.

Local Livelihoods Were Affected By the Creation of the Headwaters

As a result of the events that culminated with the Headwaters deal, both PL employees and agency representatives recognized that there was a loss of job security in the timber industry. While immediately profitable, the harvesting model that Maxxam implemented was not sustainable long term, and PL employees were the ones who experienced the most loss. As timber harvesting regulations increased, PL staffing needs changed and decreased. Additionally, when a limited labor market exists, workers often feel like they have a narrow set of choices available and have to make decisions based on their projected ability to meet their personal responsibilities (Carroll et al., 2000). Many PL workers expressed that while they did not agree with the way Maxxam was running the company, they could not quit because they had families to feed and lifestyles to maintain. While some were able to find work in the timber industry, many had to seek employment outside their field of expertise. This often required additional education, and sometimes even relocation.

Karanth and Nepal (2012) found that the success of a conservation area strongly depends on the relationship between residents and park managers, and when restrictions
are placed on access to protected area resources, it can result in the loss of economic opportunities for local communities. The Headwaters case supports this idea. Survey participants were asked what their level of agreement was on several community, environmental, and economic benefits provided by the Headwaters. Out of all of the topics, the question addressing the economic contributions of Headwaters to Fortuna had the least amount of agreement, with 33% of participants indicating that the Headwaters does not positively contribute to the economy of Fortuna (Figure 21). While the community recognizes the inherent ecological benefits of the Headwaters, supporting statements that the Headwaters protects natural landscapes and views, and native fish, wildlife, and plant habitat, they also indicated that economic benefits are not flowing into their community as they could be (Table 14). This supports the previous findings of Wilkie et al., 2006), which suggested that protected area revenue distribution can be unevenly distributed to local communities. Fortuna residents may recognize the potential for revenue flows due to their close proximity to the Headwaters, yet this is not presently the case.

Access is the Largest Barrier for Headwaters Success

Fortuna has an ecological reserve in which lay opportunities for environmental restoration and improvement, but what should the relationship look like between the community of Fortuna and the Headwaters? Survey and interview data indicate that the primary barrier to an improved and functional relationship between Fortuna and the
Headwaters is the community’s ability to gain physical, informational, and decision-making access to the Headwaters.

Many residents indicated that if there was more information made locally available about opportunities to recreate at the Headwaters, they would be more inclined to visit the Headwaters. The City of Fortuna website provides visitors with a link to “Explore the Redwoods,” however, the Headwaters is not listed, though it is geographically the closest area to Fortuna to see redwoods. The website suggests visitors drive 15+ miles to see redwoods, even though visitors can experience redwoods on a guided hike less than 5 miles from Fortuna at the Salmon Pass Trail (City of Fortuna, 2015). While this demonstrates a glaring lack of access to information for the community and visitors alike, the BLM is working in a different capacity to help bridge this gap. Currently, the BLM is working to install an informational kiosk in Fortuna near the guided access point to the Salmon Pass Trail (Personal communication, BLM employee, 2016). With increased community outreach and education opportunities, local support for protected areas can increase, thus positively affecting conservation efforts as well (Campbell et al., 2008). The installation of this kiosk brings great potential for the community of Fortuna to have improved access to information about the Headwaters, potentially resulting in increased physical access by the community. With more members of the community aware of the Headwaters and what it has to offer in terms of societal, economic, and environmental benefits, this can bring about opportunities for the BLM to build upon their relationship with Fortuna and possibly obtain increased support and involvement in Headwaters related events, activities, and projects.
Interviewees expressly noted that physical access to the Headwaters would increase the opportunity for Fortuna to economically benefit from the Headwaters. However, this is a two-fold issue because additional access could be construed as a direct threat to the protection of old-growth habitat for marbled murrelets. This raises the question of what the appropriate level of human visitation is at Headwaters, and who gets to make this decision? Pimbert and Pretty (1995) point to the benefits of shifting from passive, consultative relationships between protected areas and communities to more interactive, participatory models. Community involvement has been touted as “a vehicle to achieve environmental and development policy goals,” that can bring social, economic, and environmental benefits to communities by promoting activities to help protect the environment as well as involvement in natural resource management (Prager et al., 2015, p. 121). Through increased participation, the ability of a community to take ownership over resource development efforts rises (Nuttavuthisit et al., 2014). If protected area managers are able to justify and explain conservation in terms that have significance and meaning to communities, protected areas can be managed in ways that reflect local values, build support, and reduce resistance to them (Infield, 2001). It is possible that if Fortunans felt that they were able to participate in decision making processes, it would help ensure that the needs of their community were being addressed, including an improved local economy. In addition, difficult issues such as physical access to old-growth groves could achieve imaginative solutions through the input of diverse and invested community members. By building upon the existing relationship with the BLM,
opportunities to maintain and improve the environmental, community, and economic benefits that the Headwaters provides Fortuna are limitless.

Fortuna as a Resilient Community

Fortuna may already be demonstrating certain aspects of community resilience. Buikstra et al. (2010) point out that the natural environment can contribute to a community’s sense of pride and belonging and may even be pivotal in the ideal resilient community. The majority of survey participants agree that Headwaters contributes to the distinctive community atmosphere and/or pride of Fortuna. Being located so close to a natural area may contribute to Fortuna’s ability to demonstrate resilience and move past the resentment towards Headwaters felt by many in the community.

Magis (2010) notes that change is constant in communities, and it is resilience, not stability, that is required in order for communities to thrive by coping with, adapting to, responding to, and shaping change. Fortunans experienced a significant change throughout the late 1980s and 1990s with the takeover of PL by Maxxam, the timber wars, and “the deal.” Neither PL workers nor the economy experienced stability during that time, as employee numbers and PL profits sky-rocketed due to the increased harvest rate of valuable old-growth redwood, an unsustainable long-term business model. However, as Magis points out, stability was not required in order for the community to exhibit resilient qualities in the face of change. The community has overcome much of the adversity that resulted from the culmination of change in the local timber industry.
since the 1980s, and continues to do so today. Survey and interview results indicate that while some community members choose to hold on to the animosity and anger associated with the past, many are choosing to move forward and focus on the future. The increase in support from residents towards Headwaters demonstrates how the community has shown resilience both in the past and present, and has the opportunity to increase that resilience with time.

Learning from the Past: The Creation of Redwood National Park

When the Headwaters was created in 1999, locals still remembered the creation of Redwood National Park 31 years prior and feared for a similar outcome for their community of Fortuna. The similarities between the two nearby protected areas are many: minimal revenue stream from tourism, lost job opportunities, and a community in which many members feel angry and betrayed. The primary distinction between the two communities though is population size and infrastructure. Where Fortuna has 11,926 residents (U.S. Census Bureau, 2015), Orick has just 361 residents (California Home Town Locator, 2016). The population sizes reflect the level of respective infrastructure each community supports as well. The town of Orick supports one grocery store, a gas station, and few restaurants. In contrast, an internet search shows that Fortuna’s infrastructure includes at least 3 grocery stores, 20 restaurants, and 9 gas stations. This suggests that the amenity draw is higher for both visitors and residents to support the economy of Fortuna. This increases the potential for revenue from tourism, provides
more job opportunities, and is allowing the community to adapt to change and soften prior feelings of animosity towards the creation of the Headwaters.

Knowing and experiencing the creation of Redwood National Park places Fortuna at an advantage, as they can learn from local history and rewrite the story for their own community. By demonstrating characteristics of resilience, the community faces a future of potential opportunities for economic growth due to their proximity to Headwaters. This research supports this idea, as residents demonstrated higher levels of support in 2015 than in 1999 for Headwaters, and voiced innovative ideas to help the Headwaters better contribute to Fortuna’s economy and well-being.
CONCLUSION

This case study aims to understand the social impacts of the creation of the Headwaters on the community of Fortuna. Despite the intense controversy that surrounded its creation in 1999, feelings of conflict and resentment about Headwaters are dissipating. The takeover of PL by Maxxam resulted in a 15-year conflict over the management of old-growth redwood habitat. The creation of the Headwaters was a solution to a political problem that subsequently impacted PL employees and the local community of Fortuna. Most interview participants agreed that Headwaters is fulfilling the primary intended purpose of its creation: successful protection of marbled murrelet habitat. The reality of this outcome is more complex, however, as the solution to this environmental problem brought with it socio-economic challenges. Interestingly, while Fortuna sits very close to Headwaters, only 49% of survey participants had visited the reserve. The biggest barrier for increased levels of support is physical, informational, and decision-making access. Groups that were more inclined to support Headwaters included younger people, females, people with higher levels of education, and those who have lived in Fortuna for shorter periods of time.

Fortuna is demonstrating qualities of community resilience, as reflected in the interview data, as residents are adapting to change and softening their perspective on the Headwaters and beginning to see it as a positive asset for the community. The Headwaters was born out of conflict, however the community is recovering from the social impacts they experienced due to the years prior to and
following its creation. As survey results demonstrated, residents of Fortuna who lived through and were personally affected by the timber wars and subsequent events were more likely to still harbor resentments towards the creation of Headwaters. However, the community of Fortuna is beginning to express increased support for the Headwaters and has demonstrated interest in having more involvement with this protected area situated in their backyard.

The BLM recognizes the potential for a meaningful and impactful relationship between the community and the Headwaters, and is committed to improving their connection with the community. For several years, they have recruited volunteers from Fortuna to lead hikes at the Salmon Pass Trail (Personal communication, BLM employee, 2015). While this is a useful avenue to recruit interest in the Headwaters, it is not an activity that the whole community can participate in. In order cast a larger net and recruit a variety of people interested in the Headwaters, the BLM has worked with the RPC to develop the Friends of Headwaters group. Having a network of friends in the community who are interested in and committed to developing and improving stewardship activities at the Headwaters helps to bridge the gap between human interaction in and preservation of the Headwaters.

Additional opportunities exist for Fortuna to capitalize on the Headwaters, as with more visitation and community involvement, they may consider the Headwaters to be a true asset to the community. This may provide opportunities for Fortuna to market their town as “the gateway to the Headwaters” and demonstrate how it not only contributes to the livability, charm, and uniqueness of the town, but concurrently serves as a refuge for
species dependent on old-growth redwood habitat. It will be in the community’s best interest to find a balance between interactions with the Headwaters, while maintaining its inherent value as a reserve for old-growth redwood dependent species. With improved physical, informational, and decision-making access, there lies great potential for Fortuna to create a symbiotic relationship between itself and the Headwaters in perpetuity.
LITERATURE CITED


Green, A., Cohen, L., & Pooley, J. A. (2006). In search of community in Western Australia: A qualitative study of adults conceptualisations of their communities. ‘Listening with the third ear and other expertises’: A case analysis of social work discourse in the context of the multidisciplinary palliative care team, 18(2), 58.


Schelhas, J. (2001). The USA national parks in international perspective: have we learned the wrong lesson? Environmental Conservation, 28(04), 300-304.


APPENDIX A: SURVEY PACKET MATERIALS (ENGLISH)

Survey
Thank you for participating in this survey. Your opinion is extremely important.

Please complete this questionnaire and try to return it in the enclosed self-addressed stamped envelope by **September 1, 2015**.

*If you miss the due date, please still send in your response, we value your opinion!*

You will be entered into a drawing to win a $100 gift certificate to Eel River Brewing Company if your survey is received by September 1, 2015.
**Question 1:** How long have you lived in Fortuna?

__________ months / years (circle one)

**Question 2.A:** Have you ever visited the Headwaters Forest Reserve? Please mark how many times you have visited each place you have visited at the Headwaters.  
*If you have never visited the Headwaters Forest Reserve, you may skip ahead to question 3.*

<table>
<thead>
<tr>
<th>Places I have visited at the Headwaters Forest Reserve</th>
<th>Frequency of Visitation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 time per week or more</td>
</tr>
<tr>
<td>Salmon Pass Trail</td>
<td>☐</td>
</tr>
<tr>
<td>Elk River Trail</td>
<td>☐</td>
</tr>
<tr>
<td>Headwaters Education Center</td>
<td>☐</td>
</tr>
<tr>
<td>Other</td>
<td>☐</td>
</tr>
</tbody>
</table>
Question 2.B: Which activities have you participated in during your visit(s) to the Headwaters Forest Reserve? Check all that apply.

- Spending time with friends
- Spending time with family
- Spending time alone
- Hiking on trails
- Dog walking
- Biking
- History or cultural study
- Nature study
- Wildlife viewing
- Photography
- Geocaching
- Wheelchair use
- Redwood EdVentures Quest Program
- Public events (such as living history tours)
- Volunteering
- Working
- Other (please describe) __________________________
Question 3: What would increase your likelihood to visit the Headwaters Forest Reserve? Check all that apply.

*Each situation described below is hypothetical. This question is not meant to suggest any future planning and will only be used to gauge public opinion.

☐ A trail that would completely connect Fortuna with the existing Salmon Pass Trail at the Headwaters Forest Reserve
☐ Vehicle access from Fortuna to the Salmon Pass Trail
☐ Unguided hikes permitted on the Salmon Pass Trail
☐ Dogs allowed on the Salmon Pass Trail
☐ More opportunities for mountain bike riding at the Headwaters Forest Reserve
☐ More ADA accessible trails at the Headwaters Forest Reserve
☐ A Headwaters Forest Reserve information booth near Fortuna
☐ More tours and public events held at the Headwaters Forest Reserve
☐ More educational opportunities held at the Headwaters Forest Reserve
☐ Other (please specify) ____________________________
**Question 4:** Please indicate how desirable each of the following activities are to you when visiting *ANY public forest, park, or land*. With 1 = Not at all desirable and 5 = Extremely desirable, please circle your answer.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Desirable to you when visiting <em>ANY public forest, park, or land</em></th>
<th>Not at all desirable</th>
<th>Extremely desirable</th>
<th>No Opinion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hiking on trails</td>
<td></td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participating in a docent-led (guided) hike</td>
<td></td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spending time alone</td>
<td></td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spending time with family</td>
<td></td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spending time with friends</td>
<td></td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nature study</td>
<td></td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>History or cultural study</td>
<td></td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wildlife viewing</td>
<td></td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Photography</td>
<td></td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geocaching</td>
<td></td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dog walking</td>
<td></td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheelchair use</td>
<td></td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biking</td>
<td></td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working</td>
<td></td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volunteering</td>
<td></td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (<em>please describe below</em>)</td>
<td></td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Question 5:** To what extent do you agree with the following statements? With 1 = Disagree strongly and 5 = Agree strongly, please circle your answer.

<table>
<thead>
<tr>
<th>Statement regarding my perceptions of Headwaters Forest Reserve</th>
<th>Disagree strongly</th>
<th>Agree strongly</th>
<th>Don't Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am likely to visit the Headwaters Forest Reserve in the future</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I supported the creation of the Headwaters Forest Reserve in 1999</td>
<td>1 2 3 4 5</td>
<td></td>
<td>☐</td>
</tr>
<tr>
<td>I am supportive of the Headwaters Forest Reserve today</td>
<td>1 2 3 4 5</td>
<td></td>
<td>☐</td>
</tr>
<tr>
<td>I am satisfied with the current management at the Headwaters Forest Reserve</td>
<td>1 2 3 4 5</td>
<td></td>
<td>☐</td>
</tr>
</tbody>
</table>

Please provide any comments in the space below:
**Question 6**: Please indicate how strongly you believe each of these benefits is provided at Headwaters Forest Reserve. With 1 = Disagree strongly and 5 = Agree strongly, please circle your answer. If you do not have an opinion regarding a particular benefit outcome, check the box in the “No Opinion” column.

*HFR = Headwaters Forest Reserve*

<table>
<thead>
<tr>
<th>Community, Environmental, and Economic Benefit</th>
<th>The Headwaters Forest Reserve provides this</th>
<th>Disagree strongly</th>
<th>Agree strongly</th>
<th>Don't Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>The HFR increases the desirability of Fortuna as a place to live</td>
<td></td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The HFR contributes to the distinctive community atmosphere and/or pride of Fortuna</td>
<td></td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The HFR protects natural landscapes and views</td>
<td></td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The HFR protects native fish, wildlife, and plant habitat</td>
<td></td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The HFR provides an opportunity for the public to learn about local history, culture, and/or natural world around Fortuna</td>
<td></td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community, Environmental, and Economic Benefit Outcomes</td>
<td>The Headwaters Forest Reserve provides this</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------------------</td>
<td>--------------------------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disagree strongly..................................strongly</td>
<td>Don’t Know</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The HFR provides a place of refuge from the busy world</td>
<td>1 2 3 4 5</td>
<td>□</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The HFR increases local tourism revenue and appeal</td>
<td>1 2 3 4 5</td>
<td>□</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The HFR positively contributes to the economy of Fortuna</td>
<td>1 2 3 4 5</td>
<td>□</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The HFR contributes to the livability and charm of Fortuna</td>
<td>1 2 3 4 5</td>
<td>□</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Please provide any comments in the space below:
Question 7: What is your age?

__________ years

Question 8: What is your gender?

☐ Male  ☐ Female

Question 9: What is highest level of education you have attained?

☐ Middle School  ☐ High School/GED  ☐ Some College  ☐ College  ☐ Graduate School

Question 10: Do you belong to any of the following? (Check all that apply)

☐ Hiking clubs or organizations  ☐ Sportsman groups or organizations  ☐ Conservation or environmental organizations  ☐ Historical/cultural groups or organizations  ☐ Other (please specify group type): ______________________
Are there any other issues regarding this survey and the Headwaters Forest Reserve or any other comments you would like to make about the area and its management? Please use the space provided below.
Thank you for your participation!

Your response will help us to understand the relationship between Fortuna and the Headwaters Forest Reserve.

Please try to return this questionnaire in the enclosed envelope by **September 1, 2015**.

You will be entered into a drawing to win a $100 gift certificate to Eel River Brewing Company if your survey is received by September 1, 2015.

*If you miss the due date, please still send in your response, we value your opinion!*
Cover Letter
HUMBOLDT STATE UNIVERSITY
DEPARTMENT OF
FORESTRY AND
WILDLAND
RESOURCES

1 Haepst St.
Arcata, CA 95521

Erin Kelly, PhD
Assistant Professor of
Forest Policy,
Economics, and
Administration
Phone: 707-826-4150
Email: eck107@humboldt.edu

Alicia Jones
Natural Resources M.S.
Student
Email: acj151@humboldt.edu

Project title: Evaluating the Economic and Social Impacts of the Headwaters
Forest Reserve on the Community of Fortuna

Dear Fortuna Resident,

I am a graduate student at Humboldt State University, and I am writing to request
your participation in our survey. I am working with a team to better understand
the relationship between Fortuna residents and the Headwaters Forest Reserve
(Headwaters). We would like to know about your views and use of Headwaters.

As a Fortuna resident, your response is crucial to our research. Please help us
obtain an accurate and representative sample of Fortuna residents by completing
and returning the questionnaire. Relatively few residents were randomly chosen
for this study, and so each returned questionnaire represents many Fortuna
residents. Your opinions are needed to represent the many others not who were
not selected. Therefore, your participation is vital. The results of this study will
help inform land managers with future management decisions and outreach
efforts.

Background: The Headwaters was created in 1999 and is managed by the
Department of the Interior, Bureau of Land Management (BLM) in partnership with
the California Department of Fish and Wildlife (DFW). The 7,472 acre forest was
previously owned by Pacific Lumber Company (PALCO), a private timber company.
The Headwaters was created to preserve large stands of old-growth redwood
forest and the unique ecological values that exist within those forests.

Enclosed you will find a survey booklet, a pre-paid envelope, and a letter
requesting your contact information if you would be willing to participate in a short
interview at a later time. The questionnaire will take about 10 minutes to
complete. You do not need to have any prior knowledge of this topic in order to
participate. Please try to answer every question to ensure that your responses are
represented in our results. When you are finished, please return the questionnaire.
in the enclosed pre-paid envelope by September 1, 2015. It is important to us that your opinion is heard; however, participation in this study is entirely voluntary and may be declined or withdrawn at any time without jeopardy. Your responses will be kept confidential. You will be assigned a random case number and all questionnaire responses will be securely stored. There are no immediate benefits or foreseeable risks to participating. If you choose to participate and send in your response by September 1, 2015, you will be entered into a drawing to win a $100 gift certificate to the Eel River Brewery.

Thank you for your time and consideration,

[Signature]

Alicia Jones
Natural Resources M.S. Student
Humboldt State University

Thank you for your participation!

Participants may contact the Principal Investigator, Professor Erin Kelly, or the Student Researcher, Alicia Jones, with any questions concerning the investigation or the research procedures at any time.

Erin Kelly, PhD
Assistant Professor of Forest Policy, Economics, and Administration
Phone: 707-826-4150
Email: eek107@humboldt.edu

Alicia Jones
Natural Resources M.S. Student
Email: aj151@humboldt.edu

If you have any concerns with this study, contact the Chair of the Institutional Review Board for the Protection of Human Subjects, Dr. Ethan Gahtan, at eg51@humboldt.edu or (707) 826-4545. If you have questions about your rights as a participant, report them to the Humboldt State University Dean of Research, Dr. Rhea Williamson, at Rhea.Williamson@humboldt.edu or (707) 826-5169.
Contact Card

HUMBOLDT
STATE UNIVERSITY

Dear Participant,

We are interested in selecting a few participants from this survey to be interviewed at a later time. These interviews will give researchers a more in-depth understanding of the topics covered in this survey.

Are you willing to be considered to participate in an interview? Checking “yes” is not a commitment, you can say “no” at a later time.

If your name is selected, we will contact you by telephone or email.

☐ Yes – please provide your name, phone number, and email address:

  Name: ________________________________

  Phone: _______________________________

  Email Address: ________________________

☐ No

Thank you for your consideration!
APPENDIX B: SURVEY PACKET MATERIALS (SPANISH)

Survey
Humboldt State University

Encuesta:
Fortuna y el Headwaters Forest Reserve
(la Reserva Forestal Headwaters)

Gracias por participar en esta encuesta.
Su opinión es sumamente importante.

Favor de completar este cuestionario e intentar devolverlo antes del 1 de septiembre, 2015 en el sobre con sello y dirección adjunto.

Si se le pasa la fecha de entrega, favor de enviar su respuesta de todos modos.
¡Su opinión nos importa!

Si su encuesta se reciba antes del 1 de septiembre, 2015, Ud. será ingresado automáticamente para ganar un certificado de regalo de $100 para Eel River Brewing Company.
**Pregunta 1:** ¿Por cuánto tiempo ha vivido Ud. en Fortuna?

___________ meses / años (marque uno)

**Pregunta 2.A:** ¿Ha visitado Ud. el Headwaters Forest Reserve?
Favor de marcar cuántas veces ha visitado cada lugar en el Headwaters Forest Reserve.
*Si nunca ha visitado el Headwaters Forest Reserve, puede seguir a la pregunta 3.*

<table>
<thead>
<tr>
<th>Lugares que he visitado en el Headwaters Forest Reserve</th>
<th>Frecuencia de visitación</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Una vez por semana o más</td>
</tr>
<tr>
<td><em>Salmon Pass Trail</em></td>
<td></td>
</tr>
<tr>
<td><em>Elk River Trail</em></td>
<td></td>
</tr>
<tr>
<td><em>Headwaters Education Center</em> (el centro educativo de Headwaters)</td>
<td></td>
</tr>
<tr>
<td><em>Otros</em></td>
<td></td>
</tr>
</tbody>
</table>

Página | 2
**Question 2.8:** ¿En cuáles actividades ha participado Ud. durante su(s) visita(s) en el *Headwaters Forest Reserve*? Seleccione todas las opciones que correspondan.

- [ ] Pasar tiempo con amigos
- [ ] Pasar tiempo con familia
- [ ] Pasar tiempo solo
- [ ] Andar en los senderos
- [ ] Caminar con perro(s)
- [ ] Andar en bicicleta
- [ ] Estudiar cultura o historia
- [ ] Estudiar la naturaleza
- [ ] Observar fauna silvestre
- [ ] Fotografía
- [ ] El geocaching
- [ ] Uso de sillas de ruedas
- [ ] Programa de *Redwood EdVentures Quest*
- [ ] Eventos públicos (como paseos de historia viva)
- [ ] Trabajo voluntario
- [ ] Trabajar
- [ ] Otro (por favor describa)
Pregunta 3: ¿Qué aumentaría la probabilidad de que Ud. visite el Headwaters Forest Reserve? Seleccione todas las opciones que correspondan.

*Cada situación que sigue es hipotética. Esta pregunta no intenta sugerir planes futuros, y sólo será utilizada para medir la opinión pública.

☐ Un camino que conectara directamente Fortuna con el Salmon Pass Trail que ya existe en el Headwaters Forest Reserve
☐ Acceso por vehículo desde Fortuna hasta el Salmon Pass Trail
☐ Permiso de andar sin guía en el Salmon Pass Trail
☐ Permiso de andar con perro(s) en el Salmon Pass Trail
☐ Más oportunidades de andar en bicicleta de montaña en el Headwaters Forest Reserve
☐ Más caminos en el Headwaters Forest Reserve con acceso para gente discapacitada
☐ Una caseta de información sobre Headwaters Forest Reserve cerca de Fortuna
☐ Más paseos y eventos públicos en el Headwaters Forest Reserve
☐ Más oportunidades educacionales en el Headwaters Forest Reserve
☐ Otro (por favor describa)
**Pregunta 4:** Favor de indicar cuán atractiva es cada una de las siguientes actividades cuando visita **cualquier bosque, parque o propiedad pública.** Con 1 = no me interesa para nada y 5 = me interesa mucho.

<table>
<thead>
<tr>
<th>Actividad</th>
<th>Cuánto le atrae a Ud. cuando visita cualquier bosque, parque o propiedad pública</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No me interesa para nada...............mucho</td>
</tr>
<tr>
<td></td>
<td>Sin opinión</td>
</tr>
<tr>
<td>Caminatas</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Participar en paseos guiados</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Pasar el tiempo solo</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Pasar el tiempo en familia</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Pasar el tiempo entre amigos</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Estudiar la naturaleza</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Estudiar historia o cultura</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Observa fauna silvestre</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Fotografía</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>El geogaching</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Andar con perro(s)</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Andar con silla de ruedas</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Andar en bicicleta</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Trabajar</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Trabajo voluntario</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Otro (por favor describalo en el espacio siguiente)</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>
### Pregunta 5: ¿A qué nivel está Ud. de acuerdo con las siguientes declaraciones? Con 1 = opongo firmemente y 5 = estoy firmemente de acuerdo, por favor circule una.

<table>
<thead>
<tr>
<th>Declaración sobre mis nociones al respecto del <em>Headwaters Forest Reserve</em></th>
<th>Opongo firmemente</th>
<th>Estoy firmemente de acuerdo</th>
<th>Sin opinión</th>
</tr>
</thead>
<tbody>
<tr>
<td>Es probable que yo visite el <em>Headwaters Forest Reserve</em> en el futuro</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yo apoyé la creación del <em>Headwaters Forest Reserve</em> en 1999</td>
<td>1 2 3 4 5</td>
<td></td>
<td>☐</td>
</tr>
<tr>
<td>Yo apoyo el <em>Headwaters Forest Reserve</em> ahora</td>
<td>1 2 3 4 5</td>
<td></td>
<td>☐</td>
</tr>
<tr>
<td>Estoy satisfecho con la gestión actual del <em>Headwaters Forest Reserve</em></td>
<td>1 2 3 4 5</td>
<td></td>
<td>☐</td>
</tr>
</tbody>
</table>

**Favor de proveer cualquier comentario en el espacio proporcionado abajo:**
**Pregunta 6:** Favor de indicar cuánto piensa Ud. que estos beneficios se proveen en el *Headwaters Forest Reserve*. 1= No estoy de acuerdo, 5= estoy completamente de acuerdo. Favor de circular su respuesta. Si no tiene una opción acerca de algún beneficio, seleccione la caja en la columna bajo “Sin opinión”.

<table>
<thead>
<tr>
<th>Beneficios medioambientales, económicos y de la comunidad</th>
<th>El <em>Headwaters Forest Reserve</em> provee este beneficio</th>
<th>No estoy de acuerdo</th>
<th>Estoy completamente de acuerdo</th>
<th>Sin opinión</th>
</tr>
</thead>
<tbody>
<tr>
<td>HFR aumenta la conveniencia de Fortuna como un lugar para vivir</td>
<td>1 2 3 4 5</td>
<td>□</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HFR contribuye a la atmósfera distintiva de comunidad y/o orgullo de Fortuna</td>
<td>1 2 3 4 5</td>
<td>□</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HFR protege los paisajes y vistas naturales</td>
<td>1 2 3 4 5</td>
<td>□</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HFR protege los hábitats nativos de peces, fauna silvestre y flora</td>
<td>1 2 3 4 5</td>
<td>□</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HFR provee oportunidades al público para el aprendizaje sobre la historia local, cultura y/o el mundo natural alrededor de Fortuna</td>
<td>1 2 3 4 5</td>
<td>□</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beneficios medioambientales, económicos y de la comunidad</td>
<td>El <em>Headwaters Forest Reserve</em> provee este beneficio</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
<td>---------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No estoy de acuerdo........................de acuerdo</td>
<td>Estoy completamente de acuerdo</td>
<td>Sin opinión</td>
<td></td>
</tr>
<tr>
<td>HFR provee un refugio del mundo atareado</td>
<td>1 2 3 4 5</td>
<td></td>
<td>□</td>
<td></td>
</tr>
<tr>
<td>HFR aumenta la atracción y los ingresos del turismo local</td>
<td>1 2 3 4 5</td>
<td></td>
<td>□</td>
<td></td>
</tr>
<tr>
<td>HFR contribuye de manera positiva a la economía de Fortuna</td>
<td>1 2 3 4 5</td>
<td></td>
<td>□</td>
<td></td>
</tr>
<tr>
<td>HFR contribuye a la habitabilidad y el encanto de Fortuna</td>
<td>1 2 3 4 5</td>
<td></td>
<td>□</td>
<td></td>
</tr>
</tbody>
</table>

Favor de proveer cualquier comentario en el espacio proporcionado abajo:
Pregunta 7: ¿Qué edad tiene?

________ años

Pregunta 8: ¿Cuál es tu sexo?

☐ Varón  ☐ Hembra

Pregunta 9: ¿Cuál es su nivel de educación? (Círcule su respuesta)

☐ Escuela primaria  ☐ Preparatoria/GED  ☐ Poca universidad  ☐ Universidad  ☐ Universidad posgrado

Pregunta 10: ¿Ud. pertenece a algunos de los siguientes? (Seleccione todos los que apliquen)

☐ Clubs u organizaciones de senderismo  ☐ Clubs u organizaciones deportistas  ☐ Organizaciones de conservación o del medio ambiente  ☐ Grupos u organizaciones históricos o culturales  ☐ Otro (por favor describa): __________________________
¿Hay otros cuestiones con respecto a esta encuesta o al Headwaters Forest Reserve u otros comentarios que le gustarían hacer con respecto a esta área y su gestión? Favor de utilizar el espacio proporcionado abajo.
¡Gracias por su participación!

Su respuesta nos ayudará a entender la relación entre Fortuna y el *Headwaters Forest Reserve*.

**Favor de devolver este cuestionario en el sobre que está incluido antes del 1 de septiembre de 2015.**

Si se recibe su encuesta antes del 1 de septiembre de 2015, Ud. automáticamente será ingresado a nuestro sorteo para ganar un certificado de regalo de $100 para Eel River Brewing Company.

*Si se la pasa la fecha de entrega, por favor mándenos su respuesta de todos modos. ¡Valoramos su opinión!*
Cover Letter
Título de Proyecto: Evaluado los impactos económicos y sociales del Headwaters Forest Reserve en la comunidad de Fortuna

Queridos residentes de Fortuna,

Yo soy una estudiante graduada de Humboldt State University y estoy escribiendo para solicitar su participación en nuestra encuesta. Estoy trabajando con un equipo para entender mejor la relación entre los residentes de Fortuna y el Headwaters Forest Reserve (Headwaters). Nos gustaría saber sobre sus vistas y los usos de Headwaters. Como residentes de Fortuna, su respuesta es importante para nuestra investigación. Por favor de ayudarnos a obtener una precisa y representativa muestra de los residentes en Fortuna por medio de completar y devolver la encuesta. Relativamente unos residentes fueron escogidos al azar para este estudio, y cada encuesta que es devuelta representará a muchos residentes de Fortuna. Sus opiniones son necesarias para representar al resto de personas que no fueron elegidas. Por lo tanto, su participación es importante. Los resultados de este estudio ayudarán a informar a los administradores de tierra con decisiones y esfuerzos de proyección en el futuro.

Antecedentes: El Headwater fue creado en 1999 y es administrado por el departamento del Interior, Bureau Of Land Management(BLM) en asociación con el departamento de Fish and Wildlife-DFW (California de pez y vida silvestre). Los dueños anteriormente de las 7,472 acres de bosque era Pacific Lumber Company(PLACO), una compañía de madera privada. El Headwaters fue creado para preservar la gran cantidad del bosque seco antiguo y los valores ecológicos únicos que existen en estos bosques.

Adqueto usted van a encontrar folleto de encuesta, un sobre pre-pagado y una carta solicitando su información de contacto para si usted desea participar en una pequeña entrevista más tarde. La encuesta tomará aproximadamente 10 minutos para terminar. Usted no necesita que tener cualquier conocimiento previo de este...
contenido para poder participar. Por favor intente de contestar cada pregunta para asegurar que sus respuestas sean representadas en nuestros resultados. Cuando usted haya terminado, por favor mandar la encuesta en adjunta con el sobre pre-pagado el 1 de Agosto 2015. Es importante para nosotros que su opinión sea escuchada; sin embargo, participar en esta encuesta es totalmente voluntario y puede rechazar o retirarse al cualquier momento sin quedar en riesgo. Sus respuestas se mantendrán confidenciales. Se le asignara un número de caso al azar y todas las respuestas de la encuesta será archivadas con seguridad. No hay beneficios inmediatos o riesgos anticipados al participar. Si usted elige participar y mandar su encuesta por el 1 de Agosto 2015, usted será ingresada en una rifa para ganar un certificado de $100 para el Eel River Brewery.

Gracias por su tiempo y consideración,

Alicia Jones
Estudiante con una Maestría de ciencia en recursos Naturales
Humboldt State University

¡Gracias por su participación!

Participantes pueden comunicarse con investigador principal, profesor Erin Kelly o la estudiante investigadora, Alicia Jones, con preguntas acerca la investigación o el proceso de la investigación a cualquier momento.

Erin Kelly, PhD
Asistente profesor de Política Forestal, Economía y Administración
Teléfono: 707-826-4150
Correo electrónico: eck107@humboldt.edu

Alicia Jones
Estudiante con una maestría en Recursos Naturales
Correo electrónico: aj131@humboldt.edu

Si usted tiene alguna inquietud con este estudio, por favor de contactar al presidente de la Institutional Review Board for the Protection of Human Subjects (Comité de revisión institucional para la protección de sujetos humanos).

Si usted tiene preguntas sobre sus derechos como participante, usted las puede reportar confidencialmente al decano de investigaciones de Humboldt State University, Dr. Rhea Williamson a sus correo electrónico: Rhea.Williamson@humboldt.edu o al (707) 826-5169.
Querido participante,

Queremos seleccionar **arbitrariamente** algunos participantes de esta encuesta para entrevistarlos posteriormente. Estas entrevistas darán a los investigadores un conocimiento más profundo de los temas abarcados en esta encuesta.

¿Quiere Ud. que le consideremos para una entrevista? Si usted selecciona “sí”, **no es una obligación**. Se puede decir “no” más tarde.

Si su nombre se selecciona **arbitrariamente**, le contactaremos a Ud. por teléfono o correo electrónico.

☐ Sí – favor de proveer su nombre, número de teléfono y correo electrónico:

- **Nombre:** 
- **Teléfono:** 
- **Correo electrónico:**

☐ No

¡Gracias por su consideración!
APPENDIX C: INTERVIEW QUESTIONS

1. Could you tell me about your background and how you became involved with the Headwaters?

2. Could you tell me about the creation of the Headwaters, as you experienced it?

3. What did you personally want to see happen through the creation of the Headwaters? Do you think it is fulfilling that purpose and is it being achieved?

4. Did you support the creation of the Headwaters?

5. How did you see the creation of the Headwaters affect the local social, natural, and economy in Humboldt County?
   a. Social: What were the neighbors saying? Were people talking about it? What did you hear? What were the conversations and discussions like?
   b. Natural: What was going on in the forestry/logging industry at that time?
   c. What was the logging like that PL was doing? Why were people upset about it?
   d. Economics: What was going on economically in Humboldt County? What was the timber industry doing and how was it impacting the local economy?

6. Does present day Headwaters embody what its creators sought?

7. How should residents of Fortuna benefit from the Headwaters?
   a. What should the relationship be between the residents of Fortuna and the Headwaters?
b. Do you see the Headwaters as a benefit for the residents of Fortuna? Or a potential benefit/asset?

8. How do residents of Fortuna use the Headwaters?

9. Is there anyone in the area you could recommend that I interview to gather more information on the Headwaters?
APPENDIX D: ATLAS.TI CODE LIST

"My vision for Fortuna"
"The Deal"
"The fact that the HFR exists is a miracle"
"The last of the redwoods"
Access
Activism
Agency enforcement
Asset for Fortuna
BLM acquisition of PL land (HFR)
BLM management
Collaboration between groups
Coming together in the name of the redwoods
Community benefits
Community involvement
Community relations
Costs of the HFR
Education
Effect on neighbors
Environmentalism
ESA
Events leading up to creation of HFR
Feeling of indifference
Feinstein
Forests Forever
Fortuna "timber town"
Fortuna and jobs
Fortuna infrastructure/services
Fortuna interactions with Environmentalists
Fortunans opinions on HFR
Future HFR publications
Grassroots organizations
Habitat conservation
Harvesting Old Growth
HCP
Headwaters as part of a larger process
Headwaters Description
Headwaters Fund
Helpless feeling
HFR long term
HFR popularity
HFR purpose
HFR recreation
HFR silvicultural and natural resource management
HFR success and failure
HFR Tourism
HFR: Harvesting
Hole in the Headwaters
How they got involved with HFR
HRC & expanding HFR
HRC after Maxxam
HRC management
Hurwitz
Ideas to improve HFR visitation
Identifying OG stands
Image
Investing in PL
Job creation
Land Valuation
Litigation
Loss of community
Maxxam & Fortuna
Maxxam logging era
Media
MRC
Naming the HFR
Negotiations
Old growth value
Orick/RNP
Paying for the HFR
Personal background
PL's character/reputation
PL acquisition by Maxxam
PL after the Deal
PL background
PL layoffs
PL management
Politics
Predictions of what would happen
Private property
Public ownership
Public perception
Record keeping
Redwood history
Redwood market
Research
Restoration economy
Shift in attitude/feeling
Support creation of HFR?
Sustainability
Taxpayer $$
The Golden Rule
The takeover
THP
Timber economy
Timber wars
Trust
Vision for HFR
Visiting the HFR
What could have happened...
Wilderness protection (more than the HFR)