OPPORTUNITY FOR THE NEW NATURAL RESOURCE ECONOMY ON NATIONAL FORESTS? A CASE STUDY OF THE MALHEUR NATIONAL FOREST AND POTENTIAL IMPACTS ON GRANT AND HARNEY COUNTY RESIDENTS

BY

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Declines in timber harvest and changing economic opportunities in communities adjacent to National Forest have challenged the traditional socioeconomic fabric of many communities. Paralleling reductions in harvest levels, new resource management activities are beginning to emerge which may have the potential to replace parts of this lost economic driver. This report uses the Malheur National Forest as a case study for the opportunity of the new natural resource economy, which includes activities such as restoration, recreation and sustainable natural resource management. As many communities are still struggling to initiate and realize economic benefits, this research hopes to build capacity for communities, stakeholders and land managers to understand and measure the socio-economic effects of new land management activities.

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DEDICATION

I dedicate this to my family for the encouragement and support and to Tara for her unwavering support and dedication to maintaining our collective sanity.

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EXECUTIVE SUMMARY

Recent reductions in the timber and ranching communities in communities adjacent to the Malheur National Forest have created struggling economic conditions for many families and businesses. These reductions parallel increasing unemployment countywide and discord felt in the community. As these traditional economic opportunities for area families are diminishing, new activities on the forest are emerging, providing new, previously unavailable opportunities for area residents. These opportunities are emerging as new management objectives are directed by a variety of public, national policy, economic and environmental pressures. These new activities are part of the new natural resource economy (NNRE), which incorporates adaptive approaches to natural resource management. This includes activities such as restoration, thinning, fuels reduction, noxious weed removal, non-traditional forest products, hunting, recreation and tourism. The new natural resource economy believes that active management for environmental goals is tied to economic goals and that when applied, the NNRE can advance both the ecological and economic health of a region.

The research looked at three questions to help understand the historical impact of the Malheur National Forest and the potential future impacts on local economies.

- What has been the historical contribution of commodity production from the Malheur NF to the local economy of Grant and Harney counties?

- What is the potential contribution of NNRE activities on the Malheur NF to the local economy of Grant and Harney counties?
- How can these contributions be measured?

To answer these questions, a variety of methodologies were applied to accurately understand and represent both the quantitative aspects of the natural resource economy, as well as the qualitative impacts on community members and regional industries. From this, a variety of findings were established. The demographics of the area are consistent with rural Oregon, with higher unemployment and lower levels of educational attainment. However, the population in the region has been decreasing steadily over the past ten years, which is far different than the state of Oregon or the US population trends.

Within the Malheur National Forests new natural resource economy, traditional forest products declined at a rapid rate between the early 1990's and 2000. After this time the output of traditional timber products on the forest has been relatively stable, although a small fraction of previous harvest levels. There is still some activity, however the scale of projects is much smaller and the stability of timber sales from year to year fluctuates, creating tough conditions for area businesses. Non-traditional forest products are beginning to become bigger business, and the installation of the new biomass plant is an indication of this. As more restoration activities produce smaller diameter products, industries that can use this material are in a position to profit. Other non-traditional products such as mushrooms, berries and firewood are harder to quantify and understand because of a lack of monitoring and reluctance in the community to share information.

However, these products are being sold in the region and their impact is likely important at lease for those individuals and families involved.

Ranching and cattle grazing are also finding that changing management objectives and shifting policy is impacting their traditional industry. Concerns over endangered species, riparian vegetation and stream stability are placing increasing numbers of restrictions on the way ranches operate. While the number of livestock on the forest remains relatively constant, the number of ranches has declined over recent years.

Restoration of wildlife habitat and streams has been an increasingly legitimate venture for area businesses. The amount of money spent on these types of projects has been increasing over time and the amount of partners working with the forest service continues to grow. The collaboration between these groups allows for increased stability and opportunities for diversification for those businesses that participate in traditional harvesting activities.

Recreation on the forest is also a large part of the regional economy. This encompasses a wide variety of activities and has been actively monitored for the last several years. These results have shown that a large percentage of the users on the forest are from a 200-500 mile area and that hunting is the main activity for many users. In studies around the US, hunters spend more during their trips than any other recreation group, however sentiment in the community was that this was not being experienced on the Malheur. However, since in 2010 there were almost 20,000 controlled hunting tags issued in the region of the

Malheur, there are opportunities for area businesses to realize the potential spending of these visitors. Ecosystem services were the last component of the new natural resource economy investigated for the research. While the forest provides many services to the area communities, these will likely remain externalities in economic models because of current national policy.

Although there are many NNRE activities occurring on the forest, the understanding of their impacts on economic markets is occurring more slowly. National forest managers should look to continue to engage in habitat restoration projects and other sustainable ways to managing the land. The monitoring of these projects, and the amount of non-traditional products that come off of the forest will help managers quantify the benefits these projects are providing, as well as help to understand the markets for these activities more thoroughly. Branding the products on the forest is another way to encourage the use of Malheur resources and to help develop new markets for products that can be sold to consumers outside of the region and nationally.

One way to continue to engage local citizens is the development of projects with collaboration groups. These groups should continue to take on new projects and engage a wide variety of residents in their membership. By engaging these people earlier in the process, the ability of work to start quickly after the planning stages are complete will increase. This will also help provide more stability in the supply of both traditional and non-traditional forest products.

Local economic development also has the potential to grow with the changing activities in the forest. Diversification of businesses to be able to participate in both traditional and new forest management activities is important. There are also large numbers of recreationists that visit the forest each year. By capturing more of their spending in local communities, there are opportunities to bring in outside revenue and stimulate other industries. These recreational opportunities also have the potential to spawn vacation type retirement communities because of the lower cost of living and close proximity to recreational opportunities.

By actively engaging in the shifting direction of management on the Malheur National Forest and adjusting to trends in activities and spending. The opportunities for the new natural resource economy on the Malheur exist to support economic growth in the region.

I. Problem Statement

Introduction

Eastern Oregon is known for its rugged country and resilient people. The economic backbone for many of these families has historically been timber harvest. In 1989, 4,333 million board feet were harvested on federal lands in Oregon and in 2001 this figure had dropped to 173 million board feet, a reduction of 96% (Oregon Forest Resources Institute 2006). This dramatic drop in harvest has coincided with the socio-economic decline in many of the small towns throughout Oregon.

The causes for the reduction in harvest can be attributed to several complex factors. Although the drop has been steady since the end of the 1980's, the effects are still being felt today in resource dependent communities. Paralleling this extreme reduction in harvest levels on federal land, new resource management activities are beginning to emerge which may have the potential to replace parts of this lost economic driver. However, many communities are still struggling to initiate and realize economic benefits from these new activities. One necessary component of future success is the ability to measure the socio-economic effects on communities of new management practices.

Background

Logging in eastern Oregon has been active since European settlers began moving west in the mid 1800's. Since the inception of federal forests, lumber harvested in Oregon has

been coming off of federal land. Federal Forests are based on the Organic Administration Act of 1897, which set aside public land reserved as national forests to protect forests, secure water flow, and to furnish a continuous supply of timber.

Before the 1940s National Forest land was managed primarily for watershed protection, forest restoration, and wildfire prevention and suppression. Although this land was also set aside with the expectation of future resource extraction. During this time a majority of timber needed to fill markets was harvested on private lands. This changed with the reduction of private forests and the growth in demand for lumber following World War II. When the war ended there was an exponential increase in demand for housing and the timber to build it. The timber harvest on National Forests eventually reached nearly 12 billion board feet nationwide (US Forest Service 2009). This number has since decreased to pre 1940s levels, though the ecological impacts from the harvesting techniques and scale of the 1940s-1980s time period are still being attended to.

In Oregon, President Theodore Roosevelt established the Malheur National Forest out of the larger Blue Mountains Forest Reserve on June 13, 1908. It was during this time that the towns around the Malheur National Forest began growing from small gold mining settlements into larger towns as timber was harvested and processed for more than local use. The first mill in Grant County was established in 1916 in the town of Bates, Oregon after the Oregon Lumber Company was awarded a contract for 124 million board feet, covering 14,600 acres on the lower Middle Fork John Day River (Powell 2008). However, timber harvest remained relatively minor in Grant and Harney County until the

late 1920's. In 1928 a timber sale to the Hines Lumber Company for 890 million board feet changed the dynamics of logging in the Malheur. Soon railroads were built from Burns into the Malheur National Forest to assist in the timber sale to the Hines Lumber Company. In 1928 Edward Hines bought existing railroads and a timber mill in the town of Herrick, which changed its name to Hines, Oregon in 1931(McArthur and McArthur 2003). This sale is possibly the largest volume timber sale in the continental United States, with harvesting from this sale continuing from 1928 to 1968 (Malheur National Forest 2006). Harvesting and processing of timber from the Malheur National Forest continued to grow throughout the 1980's and peaked in 1989, providing employment and being an economic driver for many families and communities in Grant and Harney County.

And though the 1980's saw the highest recorded levels of timber harvesting on National Forests, shifts in harvesting techniques, milling, and policy changed the face of timber harvest on the Malheur National Forest. Timber production on public lands continues to decline drastically from its peak. From 1989 to 2006, a 96% reduction has been seen in timber harvested on public lands, impacting the industry and the communities that rely on it (Oregon Forest Resources Institute 2006).

In the western United States, the Northern Spotted Owl's listing as a Threatened Species under the Endangered Species Act in 1990 had large-scale implications on how and where timber could be harvested (U.S. Fish & Wildlife Service 2010). Recovery efforts increased and the amount of land available for commercial harvest in the owls range

reduced by close to 80% on National Forests. This reduction in available timber saw sales on federal lands in Oregon drop to historical lows (Oregon Forest Resources Institute 2007).

Although the Northern Spotted Owl range does not include the Malheur National Forest, this shift in forest management on Westside forests (Western California, Oregon and Washington) triggered sweeping changes in forest management across the country. For a brief period after the listing of the Northern Spotted Owl, forests in eastern Oregon and Washington continued at pre Northern Spotted Owl listing levels. However, the changes to Westside forest management caused the Pacific Northwest Regional Office of the Forest Service to reevaluate other forests management plans. June 1995 saw a revision to the Eastside Forest Plan, Appendix B establishing a list of criteria to which all future timber harvest activities had to conform.

These criteria, also known as screens, were a 14-page list of standards required for all timber sales. These restrictions included screens along riparian areas in both perennial and intermittent streams with or without fish. These new management directions said that future forest plans were to reflect the forest structure and composition of the historical range of variability from pre-settlement days. A large portion of the revised activities also included provisions for wildlife. This included several revisions that are still contested today by the timber industry. Late and old structure stages (LOS) forest harvest became extremely limited with this amendment. No timber harvests were allowed in LOS when they fell below the historic range of variability. And even in a LOS within this range,

activities could only be used to maintain its historic characteristic. Outside of the LOS, no live trees greater-than-or-equal-to 21-inch diameter at breast height (dbh) could be harvested. Late old structure stages also required connectivity corridors and a network pattern of similar types of stands. Along with the changes specific to wildlife, requirements for goshawks were also included. This protected every known active and historically used goshawk nest site, a 30-acre buffer of the most suitable habitat surrounding all active and historical nest trees, and a 400-acre "Post Fledging Area" which allowed for some restricted harvest (United States Forest Service 1995). These new restrictions on timber harvest on Eastside Forests saw timber sales drop to near Westside levels (Oregon Forest Resources Institute 2006).

While the listing of the Spotted Owl, and the changes in management directives did reduce the amount of available land for harvest, other changes in timber harvest were also occurring. During this time, raw timber began to be exported to other nations before being milled into merchantable lumber or other wood products. This shift reduced the need for large portions of the workforce. Technological advances and mechanization reduced the amount of workers needed to produce the same levels of production (Freudenburg, Wilson and O'Leary 1998). More than 10 years before the massive reductions in timber harvest on federal lands in 1990, researchers began to notice extensive closure of sawmills in rural areas in the Pacific Northwest (Young and Newton 1979). The Forest Service's Ecosystem Management Assessment Team also found that between the early 1970's and the late 1980's timber sales in the Northern Spotted Owl

region rose by more than 50% while jobs in the wood products industry declined from 168,000 to 151,000 (Forest Ecosystem Management Assessment Team 1993).

Regardless of the cause of the dramatic shifts in timber related employment, the residents of the communities in Grant and Harney County near the Malheur National Forest are still facing many economic challenges. However, opportunities for new activities are starting to be realized as companies and entrepreneurs work to provide economic alternatives for area residents.

Also within the Malheur National Forest, grazing has been active since the inception of the forest in 1908. Establishing sheep and cattle grazing systems was the first order of business in the new national forest to alleviate the conflicts that had erupted in the area (Malheur National Forest 2006). Differing opinions at that time about the damage being done to the land developed the grazing permit system that is still in use today (Malheur National Forest 2006). Although there are still differing opinions about the role that grazing should play in the National Forest, grazing and ranching are prominent activities in the Forest and the region.

STATEMENT OF PROBLEM SITUATION

Traditional forest management focused on commodity production, growing, harvesting and processing high volumes of timber from one or a few species of trees. It is being replaced by adaptive management, which aims to emulate natural forest processes.

Adaptive management includes a range of diverse activities such as thinning, hazardous fuels reduction, noxious weed removal, fish passage improvements, habitat enhancements, and landscape restoration. This change is being driven by a variety of market, environmental, and public policy pressures. The shift to adaptive forest management is not only a response to the changing policy, but is also part of the shifting paradigm of forest management.

The move away from commodity production is causing severe economic struggles in many resource-dependent rural communities. The reduction in the supply of and demand for traditional forest products has left gaps in employment, income, and livelihood for many families. However, adaptive management activities may provide a partial replacement for these gaps. Environmental management for ecological goals can contribute to the economic health of rural communities. These activities are part of what has been termed the new natural resource economy (NNRE).

NNRE holds that active management for environmental goals is inextricably tied to economic goals. Environmental management requires firms, workers, supplies, and equipment. In advancing the ecological health of the landscape, potentially merchantable material is produced. Beyond restoration, NNRE includes recreation, tourism, ecosystem services such as water purification and carbon sequestration, as well as forest products sustainably managed, such as woody biomass, timber, fir boughs, berries, and mushrooms.

Historically, the planning process on National Forests paid little attention to local economic impacts. Projects in the National Forest, which have Environmental Impact Statements (EIS) or Environmental Assessments (EA) prepared for them, have recently began to address socio-economic health of the communities around the forest. However, more work needs to be completed to fully understand the relationships and the links between the forest and the community. Certain types of projects on the forest analyze and assess the impacts of forest activities on those communities that are dependent on it. By understanding and defining the characteristics of the NNRE, the ability to track the activities will become easier to understand.

Generally accepted metrics have already been developed to monitor the changes in biological conditions the shift in management have had on forest health. Just as the change in understanding about the complex biological processes of the forest have increased the amount and type of monitoring in forests, socio-economic impacts and the role that the forest plays in local communities should be studied, monitored, analyzed and reviewed. The data collected can be used to set goals and monitor outcomes to more effectively understand the complex role of the forest. Collaborative groups can use this shift in the adaptive management of the forest economy to start analyzing the impacts that past, current and past activities have had on the local economies.

PURPOSE OF STUDY

Because of the recent shift in the economies of Grant and Harney Counties and the historical reliance on the National Forest, understanding the past, current and potential

available products and activities on the forest is critical to continued community success. The goal of the project will be to help understand the unique socio-economic role that the forest plays in Grant and Harney Counties. To help understand the impacts of activities on the forest, the study documents and analyzes the impacts of forest activities on the local economy.

This will help provide a baseline for understanding how historically prevalent activities still impact the economy. I then document new natural resource economy activities on the Malheur National Forest, and estimate the impacts of these activities on the local economy. From my data analysis and our conversation with active members of the community, I help understand the potential of these activities and their possible impact on the communities of Grant and Harney County.

To accomplish this, the report will analyze economic activities in the forest divided into two groups; traditional forest products and products of the new natural resource economy. These economic measurements look at contracts in the Malheur National Forest during the last 5 years to understand how projects in the forest have been influencing the local economy. Traditional forest production includes items such as timber sales, range activities and ore extraction.

I also look at the recent past economic impact of activities defined as the new natural resource economy in the Malheur National Forest. The report will look at the role of the NNRE in providing economic stimulus, and where potential opportunities lie.

The goal of the project is to help understand the specific role that the forest plays in Grant and Harney Counties. This will establish guidelines for measuring economic data in the forest, and help develop ways to monitor for changes in the economic viability of National Forest products in the region.

QUESTIONS TO BE ANSWERED

Traditional forest management activities are being replaced by more adaptive management techniques. The products and activities that are being produced on the forest are changing, impacting the industries and the socioeconomic conditions of Grant and Harney County.

- What has been the historical contribution of commodity production from the Malheur NF to the local economy of Grant and Harney counties?
- What is the potential contribution of NNRE activities on the Malheur NF to the local economy of Grant and Harney counties?
- How can these contributions be measured?

METHODOLOGY

The study relies on several different methods to answer my research question, including document analysis, interviews and data analysis. Each of the individual metrics and activities will have their specific methodologies for collection outlined so that continued study of the socioeconomic impact of the Malheur National Forest on residents and businesses can be completed.

To understand the historical contribution of commodity production I analyzed documents to understand the changing trends in timber sales on the Malheur National Forest. Document and data analysis will contribute as a main methodology of the paper, collecting hard data about past projects on the Malheur National Forest. This analysis will include analyzing the plans that the Malheur National Forest uses to direct its activities, as well as contracts and sale documents, among other Forest Service documents. Forest Service National Environmental Policy Act of 1969 (NEPA) documents generally contain plans for action, biological analysis, feasibility, environmental impacts, and other impacts that the project could have on the local community and its residents. These planning documents will provide a basis for understanding where products and activities on the forest are taking place.

I also looked at other forest in the region with similar characteristics to find what activities are providing opportunities for local residents. In addition, interviews were conducted with technical experts and professionals, community leaders and activists, business leaders, and involved citizens. These interviews helped to understand what the community sentiment is about the wide array of activities occurring on the National Forest. They helped provide insight into what activities are currently active on the forest, and where they feel opportunities lie.

To help measure all of the management and other activities on the forest, I analyzed other studies to provide insight. Researchers in the region have been looking at the implications

and impacts of management activities on National Forests. These researchers have analyzed many of the individual traditional and potential future activities on the forest, but often on other forests or in limited scope. This project hopes to build on the successful research of others studies and compile useful information for area practitioners.

IMPORTANCE OF STUDY

This research and paper will exist as the preliminary case study on the potential for the new natural resource economy. Few studies have been done in addressing the changing economic profile of rural areas that historically relied on National Forest lands. These new activities are becoming increasingly important to counties that are under pressure to sustain their ways of life.

The results will help provide valuable insight and data for community members who are working to reestablish the economic viability of work and products coming off of National Forests. Collaborative activities on the Malheur National Forest have begun to look at economic impacts of projects and the viability of products. This research has the goal to help provide those assisting with the monitoring to have a more complete understanding of the current conditions.

On the Malheur National Forest specifically, collaborative efforts and multi party monitoring are currently assisting in planning specific projects on the Malheur National Forest. The Blue Mountain Forest Partners is "…a collaborative group comprised of

diverse interests who have come together to advance a collective mission to enhance forest ecosystem health, economic opportunities and public safety on and around the Malheur National Forest… (Sustainable Northwest 2010).” This group is working together with the Forest Service through the project selection, planning, execution and monitoring phases. Part of the mission and a vision for the group is to support activities in the forest and the use of forest resources to improve the economic vitality and quality of life for area residents.

This research has the goal to provide members of the Blue Mountain Forest Partners (BMFP) with more effective foundation and data for providing suggestions on future activities. In addition, the Blue Mountain Forest Partners collaborative group will use the methodologies developed in the report to continue socioeconomic monitoring into the future. This will establish guidelines for measuring economic data in the forest and help develop ways to monitor for changes in the economic viability of National Forest products in the region. This research will assist the Blue Mountain Forest Partners in achieving their mission and realizing their vision for the Malheur and the residents in the surrounding area.

LIMITATIONS

Because the project was limited to the Malheur National Forest, and activities in Grant and Harney County, the scope is only reflective of this area. The Malheur National Forest was chosen for its current activities working with collaborative groups, the history of past studies on the forest and the ease of collecting data. The data, findings and conclusions of

the study are not to be representative of all National Forest Lands, public lands or public land managers. The industries and their representatives were used for their knowledge, as well as their willingness to participate in the project. Therefore, interviewed participants do not represent a statistically significant sample of the residents or the local economy. Other limitations of the paper include the limited availability of economic data in the region. Because of the small population, many of the private industry data is kept confidential. Also the availability of documents and the scope that these sources contained limited the ability to fully collect all the needed data. Researcher interpretation of the data is also limited by the understanding and comprehension of the topic materials.

Overview of Paper

The remainder of the paper will include key documentation to better understand the issues facing rural communities that formerly relied heavily on the National Forest System lands for sustenance. Chapter II will be a literature review to provide background information about what is currently known about the related areas of this thesis. Because of the interdisciplinary nature of the question, topics will range from trends in timber production to non-traditional forest products, socioeconomic trends and multiparty monitoring. The third chapter will include all the methodological information about the paper. This will provide detailed information about how the data was collected for the individual metrics evaluated. Sources and other information will be included to provide an easy transition for future monitoring of the same metrics to reduce manipulation of the data. Chapter IV will provide the findings of the collected data, breaking down each measurement and showing the trends of economic viability in Grant and Harney County

for the different products and activities measured in the paper. The final chapter will be the conclusions derived from the paper and recommendations for practitioners. The goal is to help alleviate the economic strain on the local communities and help provide insight into the future potential for economic viability off of National Forest Lands.

II. Literature Review

Introduction

Activities in the Malheur National Forest that provide economic benefit to local residents come in many forms and have changed over time. Generally before World War II, the forest's impact on the local economy came mostly through the ecosystem services and small scale harvesting that national forests provide to the surrounding areas. As the shift to harvesting timber on public land increased, area residents experienced increased direct economic impacts of timber harvest (Malheur National Forest 2006). These economic benefits have been widely studied, and area residents came to rely on wood products on National Forest lands. However, with the shift of forest management in the 1990's, changing priorities and available economic activities also shifted.

Today the local communities are struggling to fill the gaps left by the declines in harvest levels and the reductions in timber related employment. A movement to find activities to partially fill these gaps has gained steam from government organizations, interest groups and academics studying the role that other activities and approaches play in the regional economy.

On the Malheur National Forest, timber sales and cattle ranching have historically been a conduit for supporting local residents. Opportunities still exist for these activities with the changing management of National Forests though the future will most likely look

different than past activities. Restoration activities have been studied intensely as an opportunity for many small rural communities to fill the gaps in employment. However, the funding for restoration activities often come from grants and after completion do not necessarily provide additional direct employment. The use and harvesting of non-timber products has been touted as providing economic opportunities for area residents. Tourism has also been heralded as potential filler for economic stimulus in rural areas with access to National Forests. Tourism can come in many forms, from camping, wildlife viewing, hunting, photography and hiking. Other potential activities for the National Forests include carbon sequestration and other ecosystem service activities that could provide support for the growing demand of carbon markets. Alone each of these activities might not be able to provide the same economic driver as timber did historically. However, when applied appropriately and with proper foresight, collectively they could help rebuild the diminished economic impact that the Malheur National Forest has had on Grant and Harney County residents.

The literature reviewed came from a variety of peer-reviewed sources, published papers by researchers and studies conducted by researchers for the federal government. Because of the wide scope of the topic area sources were found through academic searches or cross-referenced in other papers. The papers reviewed in this chapter were chosen because they added to the existing knowledge of this multidiscipline topic and help to inform the report of the potential for the new natural resource economy.

Traditional Forest Products

Opportunities for timber related industries still exist near National Forests and include those that rely on timber byproducts and non-traditional timber. The local timber industry has developed markets for byproducts of traditional forest goods. Products such as particleboard, waferboard, plywood, glued-laminated timber, biomass, pellets, and compost have the opportunity to be produced on the Malheur National Forest.

Today, the use of wood byproducts for particleboard in furniture has become commonplace, with many producers using the lumber substitute as opposed to solid wood. Wood shavings, cutoffs, sawdust and scrap wood from lumber production were pressed and bound to create particleboards. There are approximately twelve producers of particleboards, medium density fiberboard and hardboard manufacturers in Oregon. The majority of these producers are along the Interstate-5 corridor, with the exception of Jeld-Wen and Collins, both in Klamath Falls, Oregon (Composite Panel Association 2011).

Waferboards are another wood product manufactured from less desirable species of trees. Developed in 1954 by Dr. James d'Arcy Clark, a wood scientist and environmentalist, he was looking for ways to utilize "weed" species as well as sawmill waste. Waferboard looked to take advantage of the strength of long wood fibers as opposed to short pieces in particleboard (Smulski 1997).

Plywood also was originally developed to expand uses of available timber. While variations of plywood have been in use since almost 1500 B.C. in Egypt, modern

plywood was developed in St. Johns, Oregon in 1905 (Smulski 1997). Because of its large size and dimensional stability, plywood found many applications in furniture manufacturing, trunks, crates, and other similar products. Today plywood is used extensively for sheathing in residential and commercial construction. Much of the plywood manufactured comes from trees 16-inches or less in diameter and in lower quality then trees for boards (Smulski 1997). This provides opportunities for logging companies to find buyers for products not traditionally demanded by timber mills.

Glue-Laminated timber and plywood products also offer alternatives for wood producers to develop large pieces of timber with smaller diameter trees. First used in 1893 in Switzerland, laminated timber did not come to the United States until 1934 by German immigrants building a structure in Madison, Wisconsin. However it did not become widespread until World War II when demand for large structures and buildings grew. Since this time the use of glue-laminated woods has grown significantly, opening markets for smaller diameter timber (Smulski 1997).

Other companies have provided alternative uses for wood byproducts. In western Oregon, Rexius Sustainable Solutions provides both residential and commercial products through their processing of organic waste and wood residual materials. Rexius produces compost, mulches, soils, bark, and other goods for landscape features through their use of repurposed waste materials (Rexius 2008).

Juniper is also finding markets for novelties and high-end rustic furniture. Juniper is the least utilized wood fiber resource in the area, with an estimated volume of over 700-million cubic feet in Easter Oregon and Northeastern California, with 60% of that on public land, however very little of that the public or private timber volume is ever commercially harvested (Bolsinger 1989). Some manufacturers are using juniper as wood fiber filler with plastic composites for commercial signage. This product has been used by other National Forests around the country for Forest Service signage(Forest Products Laboratory 2000). Another project that has looked to capitalize on the availability of juniper, the "Western Juniper Commercialization Project" looked to put raw materials in the hands of manufacturers for veneer. Interest by the sliced veneer samples led to production of juniper fencing material, decking and landscape timbers with success (Swan 1995).

NON-TRADITIONAL FOREST PRODUCTS

While traditional forest products are currently enjoying a large share of the forest product market, other opportunities also exist for non-timber forest products. These items are already being consumed in some capacity presently. However, their scale and impact is less understood and have not been studied extensively.

Around the world non-timber forest products have played a larger part of the local forest economy than has been seen in the United States. In India, non-timber forest products account for 36 percent of national forest revenue and in Finnish Lapland, mushroom and berry harvests made 11 percent of the value of timber harvests in the 1970's (von Hagen

and Fight 1999). Still, full understanding of these types of activities and the impact that they have on the local economies is much less understood.

In the Pacific Northwest, the US Forest Service's research station conducted surveys and analyzed available data to try to determine what opportunities were available for conservation-based development of non-timber products in the region. These types of products are receiving increased attention by conservationists and environmentalists. Community economic organizations are also interested in the opportunity of alternative sources of jobs and revenue for forest dependant communities. Opportunities for species such as mushrooms, ferns, understory plants, as well as tree based items such as cones, fruits, bark, foliage and sap. Firewood, poles and boughs are also considered non-timber products because of their shorter frequency of harvest cycles, smaller yield per unit and typically greater value per unit (von Hagen and Fight 1999).

Some of the impacts of forest products never reach the markets and assist in providing sustenance for area families. Firewood, posts and poles, and mushrooms often help area families reduce their reliance on purchasing items that allow for lower spending on household needs. For personal use, typically the sale of permits is limited to 200 posts and/or poles per household (USDA Forest Service n.d.). Commercial enterprises for post and pole harvest are less understood and a more complete economic study of the impact of these activities on local residents has not been conducted.

Some activities which are more regulated and understood such as floral and Christmas greens found that these industries are comprised of about 60 businesses in the Pacific Northwest in 1989 and employed 10,300 full or part-time employees with sales around $128.5-million (Schlosser, Blatner and Chapman 1991).

Medicinal plants also can provide an opportunity for local residents. Both phytopharmaceutical (pharmaceuticals derived from plant origin) and the herbal medicines have limited understanding of the impacts they have on local economies, however both industries are growing considerably in the United States and globally (Brevoort 1996). St. John's wort (*Hypericum perforatum* L.) and valerian (*Valeriana sitchensis* Bong.) have seen incredible sales growth in the herbal supplement market indicating potential opportunity. In addition, dwarf Oregon grape (*Berberis nervosa* Pursh), prince's pine (*Chimaphila umbellate* (L.) Bart.), yarrow (*Achillea millefolium* L.) and horsetail (*Equisitum* spp.) have opportunity to be successful (von Hagen and Fight 1999). In 1992 the herbal market in the United States was about $1-billion and had been growing at a rate of 13-15% per year (Mater 1997), with sales in 1996 reaching approximately $2.5-billion (Klink 1997).

The Juniper tree is an encroaching species in Eastern Oregon, taking over many of the areas native grasslands. Many resources are spent to remove this species from unwanted areas, however berries from Juniper also have economic potential(Azuma, Hiserote and Dunham 2005). The oil from these berries is a prime ingredient in Gin, used as an

aromatherapy as well as having other therapeutic properties. In addition there is a market for the aqueous extract of Juniper, called Roob or Rob of Juniper (Grieve 1971).

The Pacific Northwest has bountiful forests that have the opportunity to have non-timber forest products become a more competitive support for many rural communities. Studies attempting to understand these markets have had difficulty because of the unwillingness of participants to share information about location and capacity of products. Worries over increased governmental scrutiny, as well as guarded locations of mushroom locations have hampered previous research.

RANCHING AND GRAZING

Ranching and the impacts of the grazing on the land have been studied extensively to try to understand the ecological impacts this activity has on public and private lands. Grazing by native ungulates in the region has been active for thousands of years. In spite of this, the introduction of cattle and sheep relatively recently is the subject of many of the studies of ungulate grazing (Freilich, et al. 2003). Opinions vary on whether grazing is positive or negative for free range plants and the ecosystem. This topic is hotly contested on the Malheur National Forest, as indicated in the ongoing litigation over grazing allotments in Oregon Natural Desert Association v. Tidwell. At the same time, the link between the Malheur National Forest, area ranchers and the local economy is a significant one.

Current trends in beef consumption and a rising population are anticipated to continue the high demand for beef and the cattle and rangeland needed to produce it. Beef is the most preferred red meat in the United States and the average citizen consumes 67 pounds per year (Davis and Lin 2005). While demand for beef continues to grow, opportunities for ranchers and the financial returns to communities is shrinking yearly. Often as much as half of the cost of beef is occurred during the final few days before consumers purchase the meat (Pitt and Kerr 1978). The reduction in margins has forced some ranchers to look for ways to maximize their returns or accept low income and returns on investments(Pitt and Kerr 1978).

On private lands, new approaches to ranching are leading the way to conserve rangeland. One perspective looks at ranching as a conservation strategy, looking to save large parcels of land in the west from the development seen in Eastern United States (Brunson and Huntsinger 2008). As the population of the United States grows and migration to the west continues, additional stresses are being placed on private landowners to develop lands for housing and residential purposes. The continued use of the private land for ranching supports the area for the agricultural as well as environmental benefits it provides. Data from the Rocky Mountain West region indicates that as many as 45% of ranches are being sold each decade (Gosnell and Travis 2005). Compounding this, an aging ranching population indicates ranching land will continue to be sold at high levels (Brunson and Huntsinger 2008). Much of the land being converted to residential properties is in the form of low-density exurban development, the fastest growing form of land use in the United States, and especially in the west (Brown, et al. 2005).

While some of this is being seen near the urban fringe where there is access to jobs and amenities of the nearby cities or suburban areas, it is also occurring in what Shumway and Otterstrom call the "New West," which are areas with high-amenities where demographic change has led to an economic evolution away from extractive industries (Shumway and Otterstrom 2001). This shift from areas with resource extraction industries to ones with the preservation of environmental amenities is what geographers have called a "post-productivist" landscape (Holmes 2002). Although public lands would not be sold and converted to residential property, the removal of available private ranching lands could urge local citizens to request more rangelands, potentially placing greater stresses on public lands if regional cattle herds maintain current numbers.

The opportunity for increases of grazing on public lands is likely minimal, on the lands that are grazed, productivity of cattle is important to the ranchers. Studies have indicated that the earning capacity varies according to the condition of the rangeland. This study looked at mean weaned calf weight compared to the initial condition of the rangeland and found that rangelands that were in better overall condition, produced calves with higher mean weights (Teague, et al. 2009). At the same time, areas with higher range condition that were overstocked diminished in quality faster than areas with similar conditions and lower socking rates (Teague, et al. 2009). This study has shown a positive correlation between the condition of rangeland and the productivity of cattle, providing potential opportunities for range managers to keep ecological condition of the land as a high priority.

As with many of the activities on the public lands, the opportunities for grazing and the use of the resources is a contested one. Researchers have yet to come to a conclusive decision about the roll and scale that grazing can play on the National Forests, with many concerns being site specific and properly managed pastures causing little irreversible damage. However, the scope and importance that ranching plays in Eastern Oregon and Grant and Harney Counties is an important economic driver for many families and businesses.

RESTORATION

In the United States, restoration has begun to take center stage as an activity that can fulfill many of the gaps left by the recent transition out of commodity production. Throughout Oregon, restoration activities can be seen on numerous scales with differing objectives and has become a serious consideration for many firms and communities that have historically relied on resource extraction (Nielsen-Pincus and Moseley 2010). These new jobs have focused on reducing wildfire hazard and improving forest and stream habitat. This increase in forest and stream employment has been supported through the US Forest Service and the Bureau of Land Management, as well as the State of Oregon(Nielsen-Pincus and Moseley 2010).

In spring 2010 two reports were published through the Ecosystem Workforce Program at the University of Oregon that looked at the economic and employment impacts of forest and watershed restoration in Oregon. Forest restoration activities include thinning and

vegetation management to restore and improve habitat in the forests. Riparian planting, in-stream work, habitat creation, fish passage projects and irrigation improvements comprise the majority of watershed restoration activities (Ellison, et al. 2010). In one study, Nielsen-Pincus and Moseley looked at grants administered by the Oregon Watershed Enhancement Board in conjunction with interviewing local contractors who received contracting dollars. These researchers found that generally money spent on restoration work have an output multiplier of 1.9 to 2.4 increasing the benefit for Oregon businesses and employees (Nielsen-Pincus and Moseley 2010). On the Malheur National Forest, this typically is in the form of businesses contracting with the Forest Service to provide the restoration activities prescribed by the forest staff.

Businesses and entrepreneurs are also beginning to look toward restoration work to boost the bottom line and increase revenue. Business are starting to diversify their focus from traditional timber management to forest and watershed restoration as demand grows (Nielsen-Pincus and Moseley 2010). Restoration activities and the restoration economy have also become more common among the general public with books and specialists working to build capacity for restoration as a major source of development (Restoration Economy Meets Up with Organic Residuals 2002).

Existing case studies on specific restoration sites have also shown promise for restoration activities. Initiated in 2001 on the Illinois River, 999 hectares of land previously used for agriculture had been restored into bottomland forest, backwater lakes, and floodplain wetland habitat. This project employed almost 50 persons and had a positive impact on

the local economy of $1,560,525 after accounting for the loss in agriculture (Prato and Hey 2006). Through the reduction of the negative impacts of nitrogen loads and hypoxia downstream and increasing opportunities for recreational activities, estimates showed a value of $2,577.48 per hectare based on willingness to pay for the goods and services that the restoration provided (Prato and Hey 2006). This study shows that restoration activities can provide a tangible economic benefit both locally and to areas hydraulically connected.

Several studies have looked at restoration activities and the economic support it provides area residents. The construction aspect of restoration has the potential to provide area contractors with additional work outside of traditional forest management activities. At the same time, restoration also increases forest amenities that can increase secondary economic activities in the area (Moseley and Reyes 2008).

Since the early 1990's, a study looking at spending on National Forests in Oregon, Washington and California found that spending by the Forest Service for contracted activities has declined. This decline has impacted those businesses that contract work with the National Forests. To offset the reductions in budgets, restoration activities that have the potential to be funded from a diverse base can help provide some relief (Moseley and Reyes 2008). While the National Forests are no longer managed to support resource extraction, restoration projects have the ability to support economic growth through collaboration with area residents. Through this process, local residents can help

direct the course which restoration takes, addressing their needs more directly (Hibbard and Karle 2009).

Critics of restoration have argued that several aspects of restoration are either the products of poor planning and development or that the myths of restoration are not a viable solution to the problems in question. It has also been mentioned that restoration activities are not suitable for long-term sustained economic growth.

Some contend that by restoring ecosystems to pre-European settlement conditions, restoration agencies are neglecting the issues of the disadvantaged people living in those spaces. They view restoration as a movement defining spaces from a culturally and ideologically privileged standpoint (Tomblin 2009). Restoration that explicitly addresses environmental justice can sometimes be difficult to find in the planning documention for projects. The demographic make-up of restoration project planners can have profound impacts on the perspective that the restoration projects are established. Often groups do not share the diversity of membership that is expressed in the local environment and lack key ethnic groups for inclusion in the planning process. This is not to say however that restoration cannot include these voices, but that inclusion is critical for the success of projects outside of biological concerns (Tomblin 2009).

The processes by which many restoration activities currently take place have also been criticized as a falsehood. Some have contested that the complex nature of natural systems is over simplified to reach objectives, resulting in restoration activities that are not

sustainable for dynamic systems (Hilderbrand, Watts and Randle 2005). They argue that restoration projects typically contain several critical issues in their planning and execution that should be addressed for the activity to be a success in the future. By approaching restoration that also considers ecological capital, connectivity and variability, the ability of restoration projects to be successful with improved resilience will be enhanced (Hilderbrand, Watts and Randle 2005).

Other criticisms by some have noted that restoration activities do not provide direct financial benefit for private landowners. Because of the limited direct economic benefit of restoration, some landowners are hesitant to agree to undertake and finance a project. This mentality is slowly changing as private landowners begin to realize opportunities for the direct benefits that stream restoration can have. One example of this is a rancher near the Malheur National Forest who is beginning to raise many of his cattle and market his product as "grass fed." This shift to grass dependence requires that additional water resources be available to maintain adequate levels of forage for the cattle year round. By investing in stream restoration activities, the rancher hopes to increase the productivity of grasses needed for sustained cattle foraging (Pullman, Wu and Villa-Lobos n.d.).

Studies on motivation for watershed restoration have indicated that many times those who do agree to undertake restoration activities do so for more holistic reasons. One study of Oregon landowners who held property adjacent to streams and rivers found that almost 50% of landowners were motivated by future generations when making land

management decisions. This same report found just over 10% responded that profit and productivity were main motivators (Rosenberg and Margerum 2008).

It is important to note that many of the restoration projects experienced in Oregon have occurred through some form of subsidy. Often grants available through the Oregon Watershed Enhancement Board (OWEB) provide critical funding to watershed restoration projects around the state. During the last bi-annual grant cycle, OWEB provided grant recipients with over $8.5-million dollars for projects across the state (Oregon Watershed Enhancement Board 2010). Another large supporter of restoration projects is the Bonneville Power Administration (BPA). The BPA allocates funds each year for stream habitat restoration projects that impact anadromous fish species (Network of Oregon Watershed Councils 2005). During 2010, BPA spent close to $5.5-million dollars in Grant and Harney Country on fish and wildlife programs. This is part of their larger efforts on fish and wildlife, with BPA spending almost $197-million dollars in 2010 on these type of projects (Bonneville Power Administration 2011). Without this support many of the restoration activities across the state would be limited.

RECREATIONAL ACTIVITIES

Tourism and recreational activities have long been touted as a way to recoup many of the economic losses felt from the reduction in timber sales. However, valuing the economic impacts of these activities, specifically on national forests have been limited. Hunting,

fishing, camping, off-highway vehicle (OHV) use, snowmobiling, and wildlife viewing are all activities that occur on the Malheur by both local and non-local forest visitors.

A 1990 study in Georgia looked at the economic impacts of recreational spending on rural areas. This looked at the direct, indirect, and induced effects of recreational spending on the areas surrounding five state parks. Through interviews and mailed surveys they were able to calculate an estimated impact of the parks on the area economies. The five parks inventoried vary in their amenities and the amount of daily visitors and money spent reflects this. Surveys estimated mean expenditures from $7.42 to $45.58 (1986 dollars) per person per trip with a multiplier effect of approximately 1.5 (Bergstrom, et al. 1990). This accounted for almost 1,400 jobs supported through recreational spending and $14-million in total income on the local region. Fifty-percent of the total effects of the spending accounted for direct effects, followed by induced effects. This study suggested that investment in recreation might provide a viable economic development alternative for rural areas and stimulate a considerable amount of economic activity. Encouraging non-local visitation through advertising with travel brochures, maps and newspaper and magazine advertisements can augment this. The study also found that areas with highly developed recreational facilities saw the largest growth and economic impacts (Bergstrom, et al. 1990).

The economic impact of off-highway vehicle use has been studied in Arizona and indicated that this sector is an important part of the total recreation expenditures. OHV use generated nearly $3-billion in retail sales in Arizona in 2002, supporting 36,951 jobs

and adding 187 million to annual state tax revenues (Silberman 2002). However, countywide results showed varying degrees of importance from OHV expenditures from $11.7-million in Greenlee County to $1,358.1-million in Maricopa County, accounting for almost half of the states total OHV expenditures (Silberman 2002).

Hunting and fishing are activities that are enjoyed by many local and non-local users of public lands. A recent report in USA Today found that even through the economic downturn that hunting related spending has not been impacted. During these times, families look for ways to reduce household costs and hunting can help families with the grocery bills. Sporting firearms, ammunition and supplies generated $27.8-billion in activity in 2009 compared with $19.1-billion in 2008. In addition hunting licenses are also on the rise. The continued success of hunting related sales can be attributed at least partially in its ability to reduce grocery bills and act as a family activity (Roney 2010). Outside of local hunters, non-local hunters are also providing support for the local economy through purchases made while visiting the forest. These purchases can be for lodging, fuel, groceries, equipment and other miscellaneous purchases made during their trip to the region. One study found that between 1991 and 1996, the number of hunting days increased by 25% within national forests, participation increased during this time period and the expenditures made by hunters increased by 89% (Theodore Roosevelt Conservation Alliance 2000).

Nationally, wildlife and fisheries associated recreation accounted for $76.7-billion on trips and equipment in 2006 (Henderson, et al. 2010). On National Forest lands, these

activities contributed approximately $21-billion to the national economy and supported 238,800 full time equivalent jobs. Within these sectors, small game hunting was less popular than big game hunting, however both activities provided substantial contributions to local economies (Theodore Roosevelt Conservation Alliance 2000). Of three of the major wildlife activities, fishing, hunting and wildlife viewing, fishing had the largest economic impact at $2.9-billion spent with hunting and wildlife viewing following closely behind at approximately $2.1-billion (Theodore Roosevelt Conservation Alliance 2000).

ECOSYSTEM SERVICES

The Forest Service manages large areas of land throughout the Pacific-Northwest that provide many ecosystem services to the region. Nation wide national forests encompass 191-million acres of land in the United States (US Forest Service 2005). This land is being targeted as new approaches to a multiple-use, sustained yield management that incorporates the changing needs and desires of the public (Collins and Larry 2007). These large stores of natural capital are indispensable for economic progress and human capital even though they are difficult to measure and account for (Hawken, Lovins and Lovins 1999). Public land managers should look to answer several questions to help guide and account for the impacts of ecosystem services:

> **Who benefits from these services? Have they identified themselves as stakeholders? Are they aware of the value of these services? Are their services at risk or in decline? How can we prevent their degradation? What are the management tradeoffs?** (Collins and Larry 2007)

To be able to account for and convince economic markets of the value of these products, market based approaches to the investment of ecosystem services is required. Being able to attach market data and evaluation in monetary terms will provide those working to incorporate these services with greater opportunities to stimulate economic valuation through these programs(Collins and Larry 2007). The difficulty lies in attaching monetary values to often-intangible benefits.

Some work has been accomplished to establish prices for ecosystem services. Often these prices change based on location, or are complicated in their assessment and application. These models look at the externalities of the ecosystem and try to internalize them in economic markets, establishing value. Currently the Willamette Partners and the Freshwater Trust are collaborating to establish protocols, tools and resources that will allow for the sale, purchase and trade of multiple types of ecosystem service credits. This pilot project started in 2009 and is running through 2011 at several sites in the state of Oregon. Current credits include wetlands, salmon habitat, upland prairie habitat and the water temperature benefits created from riparian restoration(Willamette Partnership 2009). Their goal is to provide a more efficient and effective use of planned, compliance-driven expenses, opportunities to accommodate growth without environmental degradation, increasing coordination among various conservation and restoration efforts, rewards for voluntary actions on private lands and healthier ecosystems (Willamette Partnership 2009).

Beyond the Willamette Partnership, there have been other attempts to attach value to the economic benefit of the services that forested lands provide society. However, because the methodology used can change values considerably, the assessments are often open to debate(TEEB 2010). In spite of this, values for food, fiber, fuel, climate regulation, water regulation, groundwater recharge and pollination have been estimated in other places. These estimations have established economic values for some of the services that forested lands provide, potentially giving those who manage forested lands a baseline on valuing their own ecosystem services.

The sequestration of carbon is also an activity that has seen growth and has the potential to provide some benefit. Although the Forest Service has not used sequestration of forest carbon as an economic opportunity, it is an activity that the Forest Service and private entities have examined. Even through the economic downturn, carbon markets continued to grow and showed 37% growth between 2007 and 2009. This accounted for $144-billion in regulated carbon markets and $387.4-million in the voluntary carbon markets(Hamilton, et al. 2010). Several Forest Service reports for calculating carbon stocks are available to provide interested parties with reasonably accurate data into understanding the storage capacity of carbon on forested lands. However the Forest Service has yet to enter carbon markets although the forested lands that they manage do provide for large carbon stores.

Other Socio-Economic Studies of National Forests

While studies that approach the potential for restoration, ecosystem services, recreation and other activities that are components of the new natural resource economy are limited, studies of the socio-economic impacts of several national forests or forested regions have been completed.

Socio-economic monitoring on three communities surrounding Mount Hood was completed in 2007. This report looked at the impact of the Northwest Forest Plan on rural economies and the communities near the forest between the implementation of the Northwest Forest Plan in 1990 and 2003. Through their studies they found that the Northwest Forest Plan had been ineffective at supporting the local economies as previous levels of timber sales had. Among other factors, a lack of predictable timber sales has forced many small logging companies out of business (Kay, et al. 2007). This report also found that contracting and direct employment opportunities on the forest had also declined 15% during this period. The demographics of the contractors have also shifted, with many local contractors being replaced by those along the Interstate-5 corridor (Kay, et al. 2007). Managing the changing management goals has been difficult as many interviewees said that they either felt that too much or too little was being done to effectively manage the forest. Many felt that the shifts in management have caused the economic decline, while others felt that that the Forest Service was still practicing poor management tactics causing the degradation of the forest. Interviewees also felt that collaboration activities were not doing enough or were not effective enough to help mitigate either the economic or environmental concerns of residents. People felt that key

parties were not being included, while interest groups often played larger roles then they should (Kay, et al. 2007).

In Eastern Oregon a study was conducted to look at the state of the dry forest and the communities that surround them. Included in the study was the Malheur National Forest, along with other forest in Eastern Oregon and Northeastern California. This study found that these communities are facing many challenges in conjunction with the increasing restrictions and limitations of public lands. New activities utilizing woody byproducts and biomass for value added products have strong interest throughout communities. Unfortunately, large startup investments are required and have been slow to materialize in the area (Davis, Moseley and Nielsen-Pincus April). The city of John Day however, recently acquired its first woody biomass plant. This plant is the first in the region, and is expected to create 15 new jobs, as well as enhance job security for the sawmills remaining workforce (Callister 2010). This addition, as well as the results from the State of the Dry Forest Zone and its Communities report shows that there are high levels of capacity for forest restoration, wildfire protection, and the desire to utilize woody biomass materials.

Activities in the new natural resource economy have potential to assist and improve the socioeconomic condition of the residents adjacent to public lands. Although previous research has fragmented these segments of the forest economy, this research attempts to address these in a comprehensive manner to fully gauge their applicability. My research

will build off of earlier research to look at how the Malheur National Forest can use these new management activities to support socioeconomic resilience.

III. METHODOLOGY

BACKGROUND AND OVERVIEW

To better understand the scale, depth and impact of these activities, several approaches were taken to collect the data presented in the report. Regional, county and state representatives were contacted and information such as demographics, industry and employment were collected. Governmental reports were collected from several sources, raw data was made available, and interviews were also conducted.

DOCUMENT ANALYSIS

Demographic and industry data was collected from a variety of sources generally available. Working with local economists in the region, they provided information collected as well as data and reports publicly available for information directly related to Grant County and southeastern Oregon. The decennial census data provided population data, including household economic information. In addition, the Oregon Employment Department considers the area containing the Malheur NF as region 14, which contains Grant and Harney counties as well as Malheur County, which runs directly east of Harney County, bordering Idaho. Recent industry data as well as unemployment and industry trends for the region were available, providing for a better understanding of the socio-economic conditions.

Because the Malheur National Forest has reporting requirements for many of the forests activities, resource area representatives at the district level and supervisors office were contacted and interviewed. During each of the interviews, hard data was collected and reviewed with the staff for their estimated accuracy of the reported results. In instances where the reported numbers were not felt to be representative, notations were made and referenced in the report. Timber sales data from 1985 to 2010 was collected and analyzed to find trends and shifts in the volume, number, size and types of timber sales on the forest over the past twenty-five years. Unfortunately some of the older data was not comprehensive and complete data for analysis for this report began in 1987. Malheur National Forest Facts were also published and available from 2002 to 2009. These reports included data such as mushroom permits, Christmas tree permits, as well as basic information about other areas of forest operation.

The Malheur NF also provided the data for recreation on the forest with the two National Visitor Use Monitoring (NVUM) reports from 2004 and 2010. These reports provided a comprehensive understanding of the recreational visits and uses occurring on the forest. This report, combined with a national report on the spending habits of National Forest visitors, the Spending Profiles of National Forest Visitors, NVUM Four Year Report was able to help understand the economic impacts that recreation has on the forest and the surrounding communities. While the spending profiles are national averages, they create a baseline understanding with potential future studies linking recreation, the Malheur and the local communities more directly.

Hunting data was collected through the Oregon Department of Fish and Wildlife's (ODFW) Big Game Statistics reports, the Oregon Big Game Regulations guide, and controlled hunt data. The controlled hunt data was able to show the number of hunters for specific seasons in the region, as well as the hunters listed home address. These numbers should overlap with the recreational users reported in the NVUM reports, but provide a much more detailed analysis of visitors distance traveled. Controlled hunt data for Antelope, Bear, Big Horn Sheep, Deer and Elk were obtained. Unfortunately however, hunting units and the Malheur National Forest do not share similar boundaries and most of the hunting units share land with the Malheur, other federal and state lands, as well as private land. Interviews with ODFW representatives helped provide insight into which units would give the best representation of hunting that occurred on the Malheur, and which units had a probable majority of the units off of the forest. The hunting units used for analysis in the report included Beulah, Desolation, Malheur River, Murderers Creek, Northside and Silvies units and a map is provided in Chapter IV.

To determine the distances traveled to the forest, online mapping tool GoogleMap was used to determine the distance from the hunter's zip code to the city of John Day. This location was chosen because of its regional importance, being the main office for the Malheur National Forest and also a field office for the ODFW.

INTERVIEWS

In addition to the quantitative data and analysis completed, interviews were also conducted with a variety of stakeholders. These interviews looked to understand the

foundation and paradigm approach of industry workers, ranchers, landowners, residents, recreationists, entrepreneurs, environmentalist as well as federal, state, county and local staff. All names and identifiable information from interviewees has been withheld in the report. These interviews were open ended and varied depending on the relevant interests of the interviewee. The interviews lasted between 30-minutes and one-hour in duration. Over the period of the research, approximately twenty-five interviews were conducted with area residents, stakeholders and government staff. During the interviews I asked a variety of questions related to areas of specific individual knowledge, changes in the region over time and what activities they have been involved with. Interviewees were asked what potential certain activities had in the region and what opportunities they saw either not currently being considered or underutilized. In addition they were asked for contact information for other people they thought might be resources for topics in the area. The majority of interviews were conducted over the phone, with several less formal interviews occurring during trips to John Day, OR.

IV. FINDINGS

INTRODUCTION

New economic opportunities are starting to become tangible in many areas around the country as management of natural resources shifts away from resource extraction. Shifting paradigms of management are focusing on sustainability and environmental management in addition to the security of jobs and the creation of new industries. New opportunities are becoming available for communities to take advantage of forest products that were not accessible in the past. Small diameter wood and former byproducts are no longer burned as trash and can now be used to produce power as well as consumer goods. These activities are supplementing traditional industries in the region and providing new economic outlets. At the same time, traditional activities are still active, filling the need for wood based products and the increasing demand for beef. Many of producers involved in these traditional activities are approaching their craft in different ways than past land managers.

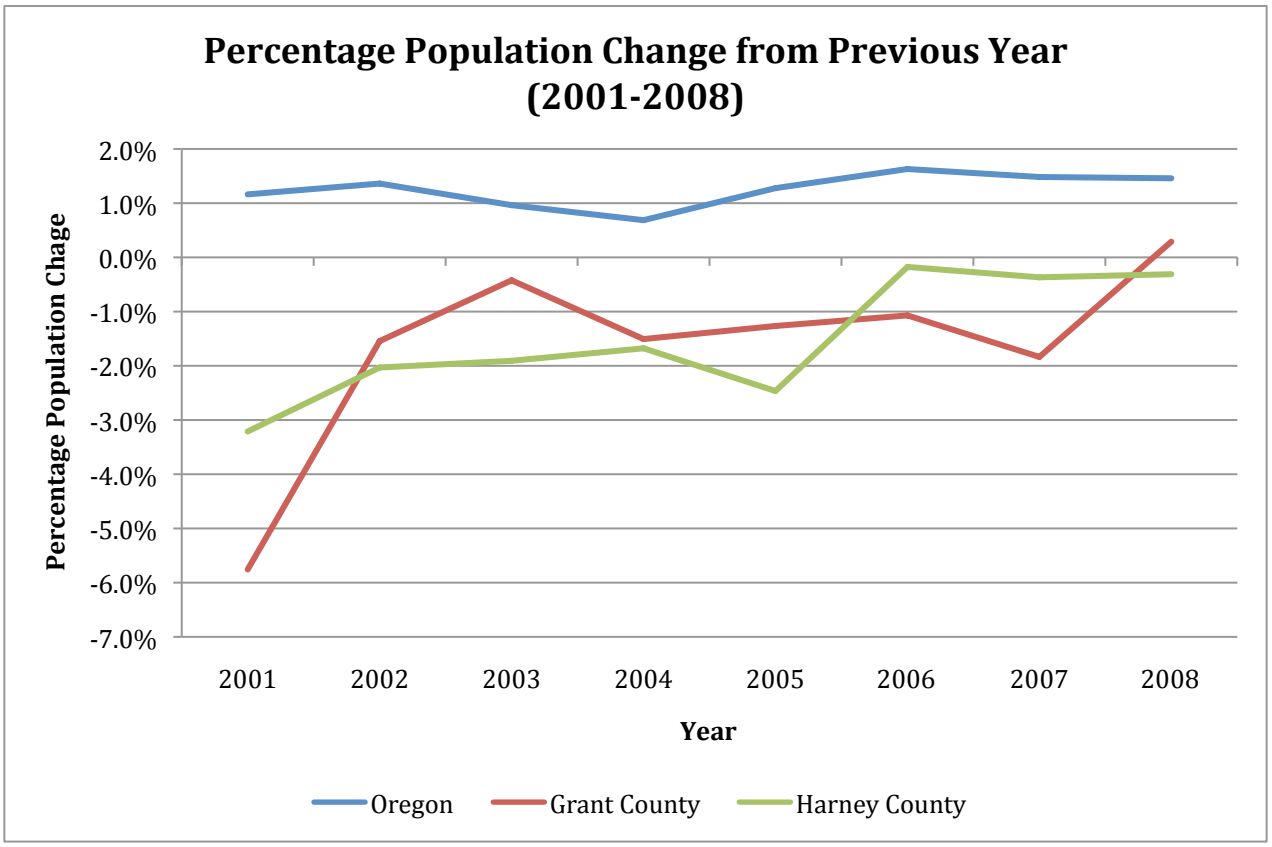
A summary of the demographics of the Grant County and Harney County, which are the two counties containing the majority of the Malheur National Forest is included. I then show the findings of the various dimensions of the new natural resource economy on the Malheur NF. The new natural resource economy activities are organized into sections on restoration, traditional forest products, non-traditional forest products, range, recreational activities and ecosystem services, concluding with a brief summary of the findings.

DEMOGRAPHICS

Demographically, Grant and Harney County share many characteristics in regards to population, household incomes, educational attainment, race and industry employment trends. These two counties are also comparable with other areas in eastern Oregon and rural counties throughout the state. While all of the data from the 2010 census is not yet available, the 1990 and the 2000 census data is available. Also, the American Community Survey produces population, demographic and housing unit estimates and the Census Bureau's Population Estimates Program produces and disseminates the official estimates of the population and housing units for states and counties.

Several characteristics in Grant and Harney County make this area unique from other areas around the state and the country. While the overall populations of the country and the state have experienced steady increases, both Grant and Harney County have seen population declines between 2000 and 2008. Oregon saw approximately 10% growth in population from 3,430,828 in 2000 to 3,790,060 in 2008. During this same time period, the population of Grant County declined by over 12% from 7,903 to 6,916. Harney County experienced a similar population loss of 11% from 7,629 to 6,747 (American Community Survey 2009). Figure 1: Percentage Population Change in Oregon, Grant & Harney County Between 2001 and 2008 show the decline in population in the two counties while the state of Oregon shows yearly growth. Rapid rates of decline occurred in the two counties during the first few years of the new century, with percentage of population change becoming more stable in the past two to three years.

Figure 1: Percentage Population Change in Oregon, Grant & Harney County Between 2001 and 2008

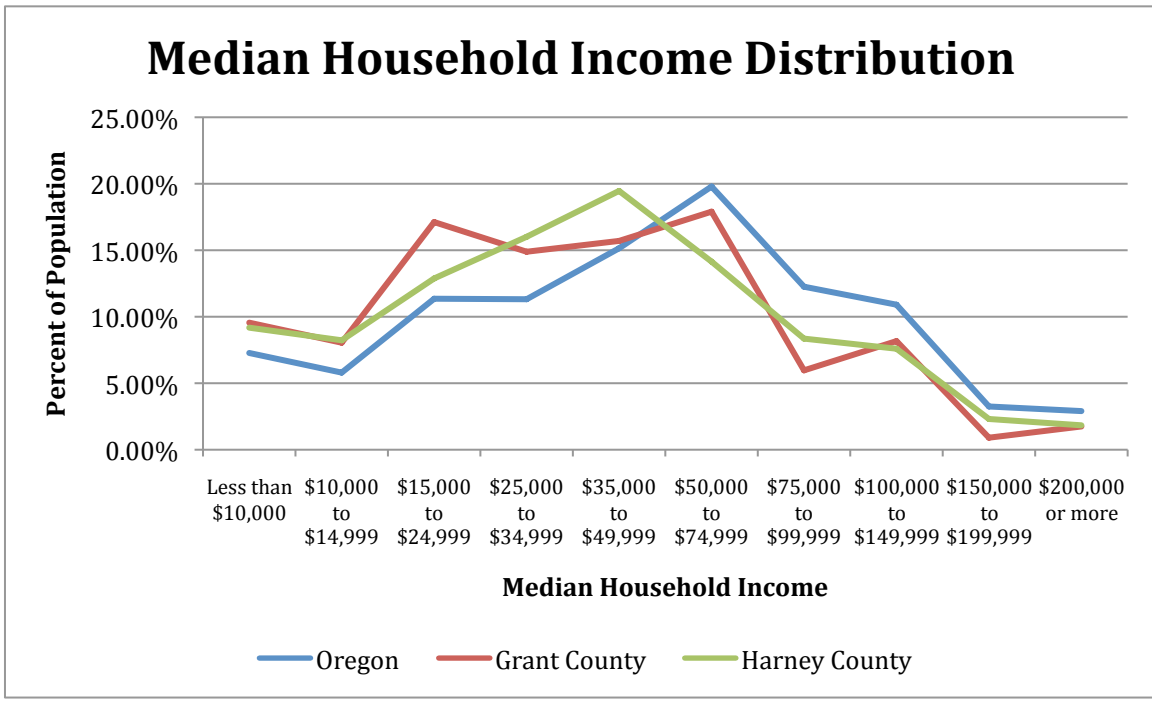


Source: 2005-2009 American Community Survey 5-Year Estimates

While these two counties have experienced a population decline at a time when most of the countries are experiencing growth, other demographic attributes also characterize the unique needs and fabric of the region. Figure 2: Median Household Income Distribution for Households in Grant County, Harney County and Oregon shows the estimated median household income data for 2009. When looking at the distribution of the median household income of these two counties with the rest of the state of Oregon, we see that for incomes lower than $50,000 both Grant and Harney County have higher percentages of their population with these incomes. Above $50,000 in median household income in these counties we see that the gap between the average for the state, and these two

counties is significant. Harney county has almost 5% less households earning $50,000-$74,999 than Oregon, and Grant county has over 5% less households earning $75,000-$99,000 than the state (American Community Survey 2009).

Figure 2: Median Household Income Distribution for Households in Grant County, Harney County and Oregon in 2009

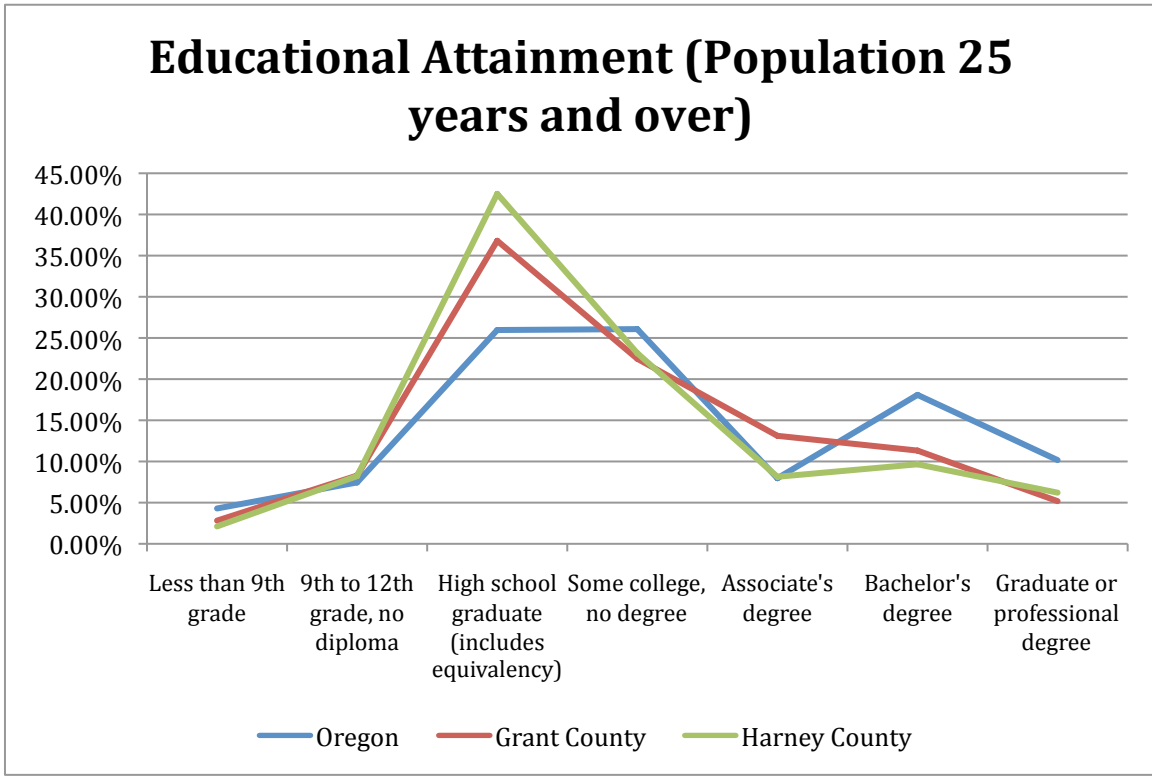


Source: 2005-2009 American Community Survey 5-Year Estimates

When we look at the educational attainment of the population, we see that it follows a similar pattern as the median household income data. Figure 3: Educational Attainment in Oregon, Grant County and Harney County for Populations 25 Years and Over shows the comparative attainment of each of the three areas. In Grant and Harney County a much higher percentage of the population are high school graduates. In Harney County this shows that almost 43% of the populations highest educational attainment is a high school diploma or equivalent compared to the Oregon average of just under 26%. Grant County is also above the state average in this category at almost 37% of the population.

Percentages of the areas with bachelors degrees or beyond are also lower for the two counties compared to Oregon, though similar to each other (American Community Survey 2009).

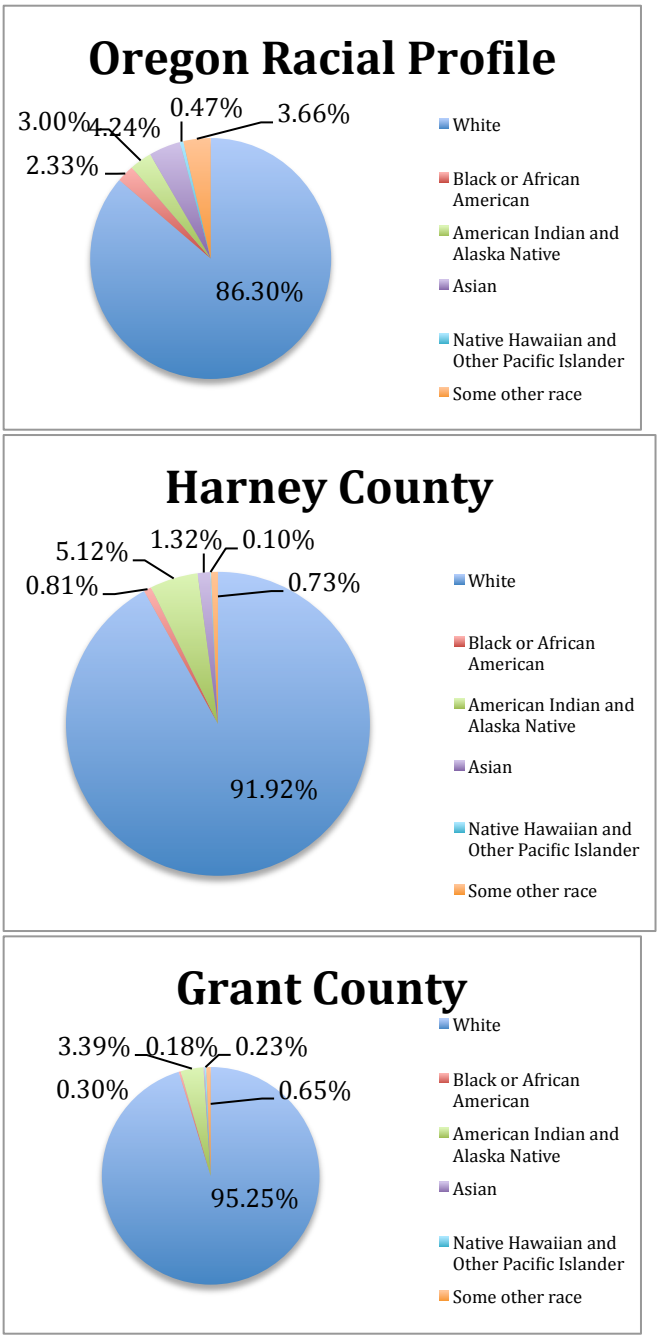
Figure 3: Educational Attainment in Oregon, Grant County and Harney County for Populations 25 Years and Over



Source: 2005-2009 American Community Survey 5-Year Estimates

The racial makeup of these two counties is also similar. In general, they are also more closely related to the state of Oregon than other states in the nation. In Grant and Harney County, a significant majority of the population is White, followed by American Indian and Alaska Native at 3.39% and 5.12% respectively. Figure 4: Racial Profiles of Grant County, Harney County and Oregon (2009) shows the profiles for the two counties and the state of Oregon.

Figure 4: Racial Profiles of Grant County, Harney County and Oregon (2009)



Source: 2005-2009 American Community Survey 5-Year Estimates

Industries employment and pay trends in the two counties also show the uniqueness of the area. Table 1: Industry Employment and Pay Trends in Grant and Harney County Compared to Oregon shows the active industries and the average pay for these employees compared to the same industries at the state average. Only the industries with available comparative data were included in Table 1. On average, employees in all industries earn about 75% of the state average. According to the data, the two counties individually account for 0.14% of the states employees, or approximately 0.3% combined. Industries that are very active in the area include animal production that is 3.5% of the total states employees in the two counties, as well

as many Federal and State positions. These were governmental positions in public administration and natural resource and mining. This should not be a surprise because of the high percentage of federal and state owned land in the counties, including the Malheur National Forest.

Table 1: Industry Employment and Pay Trends in Grant and Harney County Compared to Oregon

Industry	Ownership	% Harney Co. Employees in OR	Difference in Harney Co. Average Pay to OR	% Grant Co. Employees in OR	Difference in Grant Co. Average Pay to OR
Total All Ownerships	**All**	**0.14%**	**74.24%**	**0.14%**	**74.06%**
Total Private Coverage	Private	0.09%	60.87%	0.10%	61.16%
Natural Resources & Mining	Private	0.31%	103.77%		
Animal production	Private	2.55%	96.70%	1.00%	75.98%
Agriculture and forestry support activities	Private	(c)	(c)	0.55%	115.58%
Construction	Private	0.10%	61.44%	0.17%	63.36%
Construction of buildings	Private	0.15%	53.04%	(c)	(c)
Heavy and civil engineering construction	Private	0.23%	66.53%	(c)	(c)
Specialty trade contractors	Private	0.05%	51.17%	0.07%	48.03%
Manufacturing	Private	0.01%	46.93%	0.08%	58.45%
Fabricated metal product manufacturing	Private	(c)	(c)	0.05%	44.78%
Trade, Transportation. & Utilities	Private	0.12%	76.00%	0.11%	70.33%
Wholesale	Private	0.03%	45.68%	0.05%	44.03%
Merchant wholesalers, nondurable goods	Private	(c)	(c)	0.12%	41.89%
Retail	Private	0.16%	93.88%	0.14%	81.01%
Motor vehicle and parts dealers	Private	0.29%	84.33%	0.15%	86.44%
Building material and garden supply stores	Private	0.10%	94.57%	0.23%	65.88%
Food and beverage stores	Private	(c)	(c)	0.23%	95.01%
Health and personal care stores	Private	(c)	(c)	0.38%	55.50%
Gasoline stations	Private	0.53%	98.56%	0.15%	50.51%
General merchandise stores	Private	0.11%	79.90%	(c)	(c)
Transportation, Warehousing & Utilties	Private	0.09%	129.31%	0.10%	123.54%
Truck transportation	Private	0.05%	65.31%	0.08%	63.04%
Information	Private	0.06%	76.49%	0.13%	57.10%
Telecommunications	Private	(c)	(c)	0.34%	75.01%
Financial Activities	Private	0.08%	49.08%	0.09%	58.99%
Finance & Insurance	Private	0.08%	46.71%	0.11%	51.25%
Credit intermediation and related activities	Private	0.15%	56.56%	0.18%	61.63%
Insurance carriers and related activities	Private	0.02%	30.93%	0.05%	42.12%
Real Estate Rental & Leasing	Private	0.07%	56.32%		
Real estate	Private	0.06%	38.40%		
Rental and leasing services	Private	0.11%	93.88%		
Professional & Business Services	Private	0.05%	50.47%	0.05%	49.91%
Professional, Scientific & Technical Svcs	Private			0.07%	41.22%
Admin. & Support, Waste Mgmt & Remediation	Private			0.05%	79.63%
Education & Health Services	Private	0.08%	69.50%	0.06%	48.66%
Leisure & Hospitality	Private	0.15%	66.52%	0.10%	71.05%
Arts, Entertainment & Recreation	Private	0.05%	37.79%		
Accommodations & Food Services	Private	0.16%	71.29%		
Accommodation	Private	0.33%	61.86%		
Food services and drinking places	Private	0.14%	72.35%		
Other Services	Private	0.09%	64.64%	0.10%	78.20%
Repair and maintenance	Private	(c)	(c)	0.12%	76.37%

Industry	Ownership	% Harney Co. Employees in OR	Difference in Harney Co. Average Pay to OR	% Grant Co. Employees in OR	Difference in Grant Co. Average Pay to OR
Membership associations and organizations	Private	0.10%	54.38%	0.13%	66.28%
Total All Government	All Govt.	0.38%	83.80%	0.37%	84.40%
Total Federal Government	Federal	0.88%	79.95%	0.90%	77.58%
Natural Resources & Mining	Federal	1.71%	89.61%	6.01%	92.16%
Trade, Transportation. & Utilities	Federal	0.15%	57.20%	0.22%	58.61%
Public Administration	Federal	1.75%	80.99%	0.14%	69.76%
Total State Government	State	0.20%	86.52%	0.20%	88.04%
Construction	State	0.45%	79.86%	0.56%	80.54%
Education & Health Services	State	0.13%	59.70%	0.09%	72.05%
Public Administration	State	0.25%	90.56%	0.29%	81.09%
Total Local Government	Local	0.37%	76.39%	0.34%	77.37%
Trade, Transportation. & Utilities	Local			0.21%	31.17%
Education & Health Services	Local	0.35%	89.05%	0.38%	93.01%
Leisure & Hospitality	Local	(c)	(c)	0.30%	88.06%
Other Services	Local			1.18%	12.01%
Public Administration	Local	0.41%	62.08%	0.37%	55.99%

(c) Confidential

Source: Oregon Employment Department

While findings from the demographic analysis indicate that the two counties are losing residents and employers, a feeling in the community is that people are beginning to move back to the region. During interviews, area residents acknowledged that the population has declined since the 1980's and 1990's, but the same residents also said that they are seeing more growth from those seeking recreational opportunities and the natural amenities offered in the region. One person mentioned that as Bend, Oregon gets increasingly larger, they believe that recreationists looking for a smaller town feel with natural amenities will look further east to cities like John Day and Burns, however there is no data to support this. Along with recreation, additional industries and activities have potential to supplement economic activities in communities around the forest.

THE MALHEUR NEW NATURAL RESOURCE ECONOMY

As traditional extractive economic opportunities in the region are becoming less profitable for area business, new activities are beginning to emerge as alternatives. These

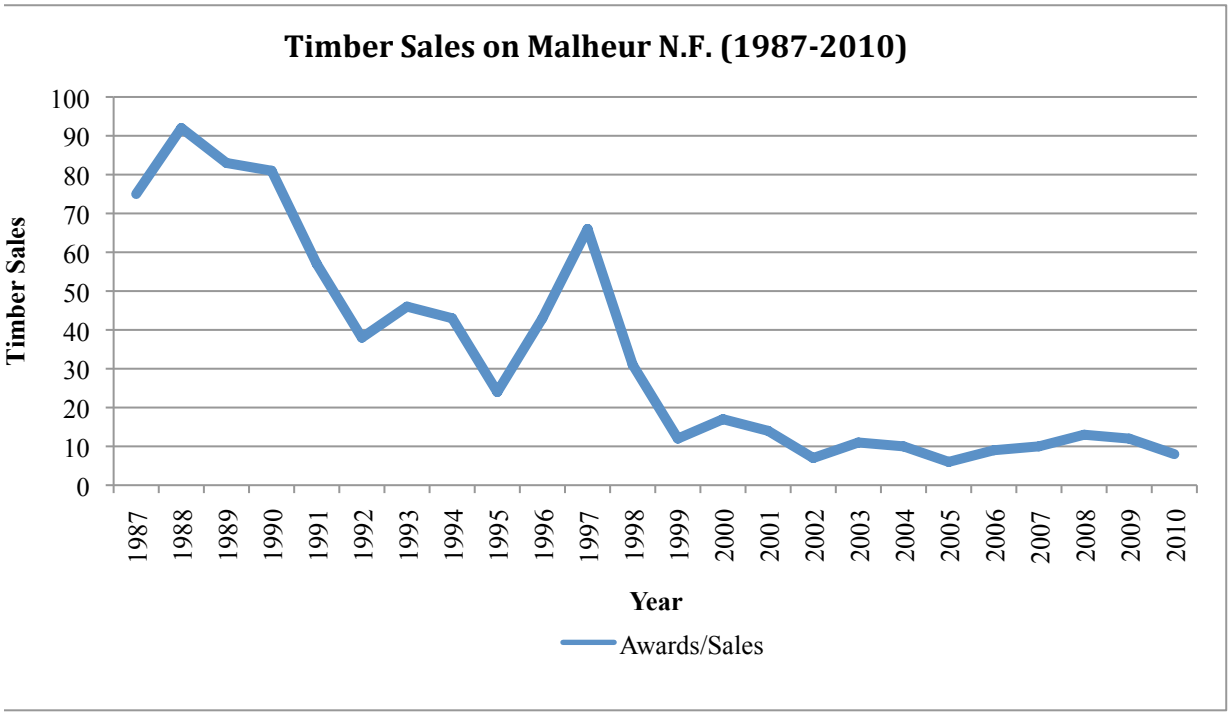
activities comprise the new natural resource economy and include traditional as well as new industries that focus on sustainability and complement current trends in resource management. Restoration of the landscape has become increasingly active on both public and private lands as land managers begin to see benefits in the environment and the bottom line. Both traditional and non-traditional forest products are using the natural resources available in the region to supply the demand for goods in and outside of the region. Recreation has been touted as a way to fill gaps left by declines in timber output and many area residents are hoping to benefit from the transition. Ecosystem services are also beginning to be analyzed as opportunities for this developing market are initiated. The remainder of the chapter shows a more in depth look at each of these opportunities on the Malheur National Forest.

Traditional Forest Products

Timber activities on the Malheur National Forest and the surrounding communities have been an essential part of the local economy since the inception of the Malheur NF. Over time, the amount of timer sales and the total volume of timber coming off of the forest have varied considerably. During the 1980's and early 1990's, large volumes and quantities of timber sales caused an increase in the amount of jobs related to the timber industry in the forms of truck drivers, fellers and timber mills. Since this time the total volume has reduced dramatically, causing strain on the local communities. These reductions have mirrored the declining population and high unemployment rates in the area with the current jobless rates in Grant and Harney Counties near 18% (Worksource Oregon 2011).

Timber sale data was collected from the Supervisors Office at the Malheur National Forest to achieve a clear understanding of the scale of the timber decline specific to the Malheur NF. Information collected from 1987 to present shows a clear picture of the declining number of timber sales on public lands on the Malheur, impacting timber industries in Grant and Harney Counties. The total number of timber sales has declined since 1988 from a peak of 92-timber sales to an average of 10-timber sales the last five years. This decline has occurred steadily since the 1980's, reaching current levels in the 2000's. Figure 5: Timber Sales on Malheur NF (1987-2010) shows the number of timber sales from 1987 to 2010.

Figure 5: Timber Sales on Malheur NF (1987-2010)

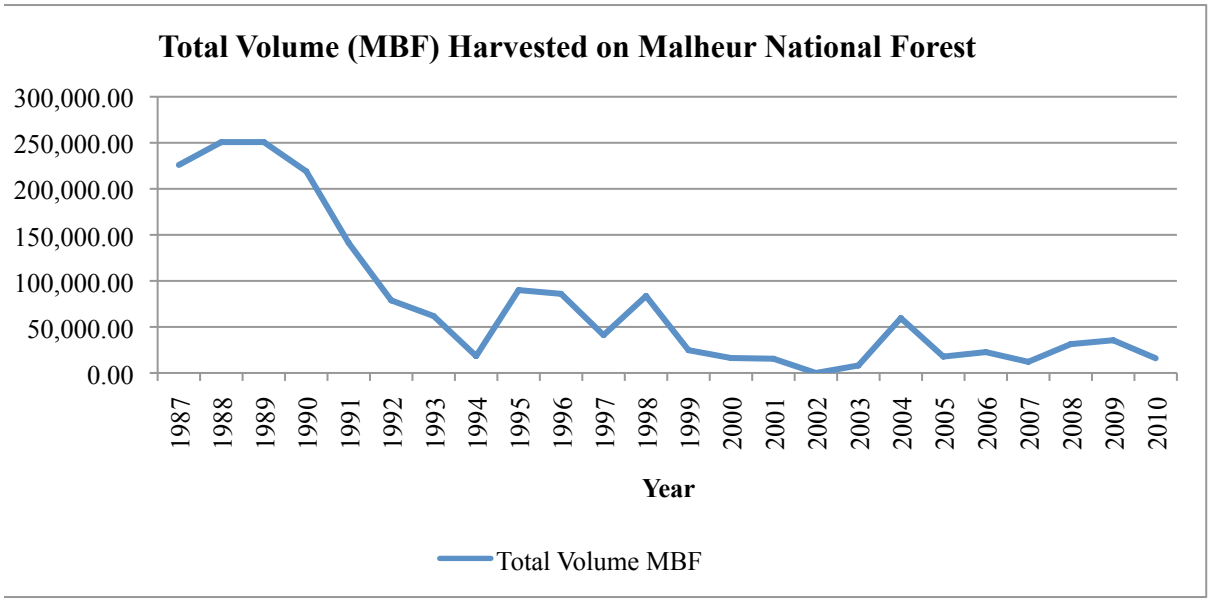


This decline has been relatively consistent, except for a short time in 1997 when the number more than doubled from 24-timber sales in 1995, 43-timber sales in 1996 and 66-

timber sales in 1997. Although there was this increase in the number of timber sales, Figure 6: Volume of Timber Sales on Malheur NF (1987-2010) shows that harvest levels remained relatively consistent. Since this time, the number of timber sales has reduced to the current levels. This low has been experienced since 1999, when there has only been an average of 11-timber sales a year during the past 11 years.

This trend of declining timber sales corresponds to the decline in the total volume being harvested as well. In Figure 6: Volume of Timber Sales on Malheur NF (1987-2010) we see that the volume in available data peaked in 1988 and 1989 with approximately 250,000 MBF harvested on the Malheur. Since that time however, there has been a dramatic decline. In 2010 the total volume harvested (15,982 MBF) was only 6.4% of the total volume harvested in 1989 (250,788 MBF).

Figure 6: Volume of Timber Sales on Malheur NF (1987-2010)



Today, the number of timber mills in the area has dwindled from the 1980's when several timber mills were operating on multiple shifts. According to area industry representatives the supply of timber on private lands has also been declining, reducing the total volume of timber available and impacting the industry as a whole. At the same time, the wood products manufacturing, forestry and logging and agriculture and forestry support activities are still a larger portion of the Grant and Harney Counties economy then the state averages as shown in the demographics section.

Interviews with area loggers, timber harvesters, mill operators, environmentalists and others in the forestry field produced several observations about the state of the timber economy in Grant and Harney Counties. In general, everyone interviewed thought that more could be done with the current resource management of the national forest. Many felt that the current process for management was not effective at properly managing the forests.

On the timber industry side, interviewees felt that more could be done to increase the amount of timber being harvested on the national forests. They acknowledged that the levels experienced during the 1980's were probably more than the capacity of the forest, but claimed that the current levels were leaving too much of the forest overgrown. They feel the reduction in harvesting to current levels has increased the potential for fire hazard and amplified its possible severity. They believe that to try and return to the historic condition, the forests have to be more actively managed. There was also a feeling of loss when areas that do experience wildfire are not harvested for the available timber in the

area. These sales could provide for new jobs, as well as put money into the local economy and area schools.

Environmentalists on the other hand are concerned about the long-term stability of logging and the strains placed on the ecosystem. Harvest levels in the 1980's saw high levels of habitat elimination and placed large stresses on the plants and animals in the region. They are concerned that the current prescribed harvest levels are overestimating the natural ability of the ecosystem to recover. Outside of concerns for the ecosystem, some feel that in addition to the potential degradation of the resources logging can do, that the reliance on natural resource extraction does not provide for a stable economy. They believe that the shifts in management activities over the last two decades have shown that tree farming and timber extraction are not the direction the national forests are going and that economic diversification is an important activity for area residents.

Non-Traditional Forest Products

Non-traditional forest products are an active part of the local economy in the region. Passing through the area, visitors will see signs for juniper furniture along all parts of the highway, and a browse through the local paper will find articles about bio-fuels. These activities are becoming more active in the region as time progresses. Since the decline of traditional timber products, lumber mills and foresters have begun looking for additional means to generate revenue. Businesses managing hazardous fuels, forest health or other technically related forest activities have started to fill employment gaps left by reductions in timber harvest.

In Grant County, the Malheur Lumber Company with the collaboration of several other groups has launched a woody biomass plant. Products from this plant can be made from smaller diameter timber that was traditionally a byproduct and had little value. In 2008 the company began investigating whether the infrastructure and natural resources were available to supply a plant producing wood pellets and bricks. The need for products made from smaller diameter logs has the potential to provide timber companies with additional opportunities for federal contracts of smaller diameter materials.

Today the woody biomass plant in John Day is operating two shifts a day, five days a week employing 11 people. Two additional employees at the plants chipping station are also supported by this plant (Bartlett 2011). Both the Grant County Airport and the Blue Mountain Hospital in John Day are using the materials from Malheur Lumber to supply their heating and water heating needs.

At the timber mill in Prairie City, OR, a cogeneration plant first installed in 1983 is used to power the sawmill with the byproducts of the milling process. Hog-fuel, which is the bark, limbs, sawdust and other byproducts fuels the cogeneration plant. When at full capacity, the cogeneration plant produces enough power to fill the needs of the sawmill as well as add more power back into the grid. Unfortunately however, current low energy prices and operation costs make selling the excess power not cost effective for the mill.

Other timber activities occurring on the forest are more difficult to track because of the difficulty in monitoring for the activities and their smaller scale. However, some data is collected for the number of permits sold for firewood, post and pole and Christmas trees.

Table 2: Timber Related Products Harvested on Malheur NF (2004-2009)

Year	Post and Pole Permits	Firewood Permits	Cords of Firewood Harvested	Christmas Trees Harvested
2004	No Data	1,275	5,213	599
2005	No Data	951	4,316	583
2006	40	1,285	6,159	504
2007	52	1,361	6,748	501
2008	54	1,950	8,640	582
2009	58	1,492	7,446	621

Source: Malheur National Forest – Forest Facts

Table 2: Timber Related Products Harvested on Malheur NF (2004-2009) shows the number of permits and known harvest levels for non-traditional timber products. These numbers show steadily increasing demand for post and poles and continued numbers for Christmas trees over the years with the available data. The number of firewood permits shows large changes in the number sold through the six years of data. In 2008 and 2009 the number has almost doubled the 2005 data of 951 permits sold, although this year was dramatically lower than other years. Permits currently sell for $5 per cord of wood, with a four-cord minimum. The number of cords harvested was an average of only four-cords per permit in 2004, increasing to five-cords per permit in 2009. While permits for cords are only allowed for personal use, interviews have indicated that the actual number of cords being harvested is probably higher, with some of those cords also being harvested and sold for profit. This increase in the gross number of permits sold and the cords harvested per permit coincide with the declining state of the national economy, potentially providing for lower priced heating options for area residents.

Other non-traditional forest products in the region include mushroom harvesting as well as berry picking. These activities have the potential to provide economic opportunities for area residents as well as subsistence for families. Understanding of the scale of these activities however is limited because of a lack of reporting. Mushroom permits are not required to harvest, possess or transport less than one gallon of mushrooms for personal use. For commercial use, a permit is required and charged on a per-day basis, with a ten consecutive day minimum. Because there is not a permit requirement for personal harvesting and commercial permit numbers are not good indications according to staff, actual harvest of mushrooms on the forest is unknown.

Other types of berry and vegetation picking and harvesting are not strongly regulated on the forest and personal use is not monitored. Economic information about the impacts of these activities is also unavailable because of the small number taking part in the activity and the somewhat reclusive nature of the business. However, as traditional forest harvesting declines, these activities have the potential to become more profitable and their impact better understood.

Ranching and Grazing

Besides traditional forest products, ranching is the other main activity in Grant and Harney County, with a large percentage of the private land being used for cattle ranching. Just as timber harvesting is a highly contentious issue in the region, ranching on public land is also highly contested, with litigation over grazing on the Malheur current in the court system.

Actual numbers for grazing cattle vary each year, however there is a more stable number of allotments and permittees using public land for grazing. Management of the allotments is on a rotational schedule, with almost all of the grazing occurring between July and September. Outside of these times the cattle are kept on private lands either owned by the rancher or by landowners from whom they rent the land. It is during the time that cattle are on public lands that ranchers grow and process their grasses for use during the winter months.

According to the Malheur National Forest – Forest Facts there are 111 allotments on the forest. Within these allotments, there are 95 permittees, 97,632 permitted cow/calf units and 1,530 permitted sheep/lamb units. The available data indicates that this number has not changed between 2004 and 2009 when the last available data was collected. Economic impacts of ranching on the region are difficult to obtain since many of the operations are family run and their finances are not public information.

However, several allotments are currently being restricted from grazing through litigation over the Endangered Species Act, impacting 19 ranching families in Grant County. Regional economists and Grant County public officials have worked to try and understand the impacts that this could have on the local economy. The current litigation is impacting 19 families, an estimated total number of 57 family or non-family employees with the number of cattle at 3,800 cow/calf pairs. According to their estimates, each calf would be worth approximately $700 in the fall, resulting in the total economic impact of

the current injunction at $2.6 million. If a complete income loss, this would account for 1.3% loss of the county's total personal income. While this is a rough estimate, it does provide some insight into the economic impact that ranching has on the local community. Because of this injunction, several families have either sold their ranch to larger operations or have left the industry.

The importance of the Malheur to area ranching businesses was expressed during interviews with area ranchers. These ranchers discussed the amount of land in the area that is comprised by the national forest, the types of grass, costs and water profiles that change throughout the year. During the summer months, ranchers will typically move their cattle off of the private lands to allow the opportunity to grow grasses that will be used during the winter months. During this time, the cattle typically also occupy the higher elevation areas because of the still green grasses. These higher elevation areas in Grant and Harney counties are in most cases on public lands, which occupy a large portion of the total land in the area. Ranchers also indicated that quality alternatives do not exist for large-scale operations during the summer months. Costs are also a factor, with public lands generally being more cost effective for ranchers than private lands during this time of the year.

RESTORATION

Restoration on the National Forest has been increasing in recent years as additional grant and federal money is available to complete activities on the forest that have a restorative nature. Collaborative groups are also active on the forest, helping to bridge the gaps

between the community members, the federal employees and the management of public lands. Often times, restoration projects are completed on the public lands with a diverse set of stakeholders, helping to increase the potential of projects being completed, and also to help defray the costs of these projects. As indicated in the literature review, these projects can sometimes cost large sums of money. Depending on the desired results, these can sometimes not be directly related to any additional revenue streams for national forests. However, these restoration projects often help establish sections of the forest that become sanctuaries for fish or other wildlife. Because of the depletion of natural lands in the private sector, there is an increasing need for such lands across the country.

The Malheur has collected data on restoration activities throughout the forest. This data is categorized by restoration activities directed at wildlife habitat with and without partners, and also with fisheries habitat with and without partners. Table 3: Wildlife Habitat Restoration/Improvements on the Malheur NF (2004-2009) shows a list of the number of wildlife restoration projects on the forest, the size of the project and their total cost.

Table 3: Wildlife Habitat Restoration/Improvements on the Malheur NF (2004-2009)

	2004	2005	2006	2007	2008	2009
Wildlife Habitat Restoration/Improvements With Partners						
Projects	10.0	10.0	9.0	9.0	8.0	14.0
Acres	784.0	2,624.0	2,024.0	6,994.0	14,118.0	28,150.0
Forest Service Dollars	$85,833.0	$55,015.0	$43,417.0	$66,799.0	$58,457.0	$78,034.0
Partner Dollars	$54,930.0	$70,970.0	$56,005.0	$36,091.0	$21,259.0	$51,600.0
Partner In-kind Value	$34,500.0	$20,420.0	$20,831.0	$71,126.0	$63,568.0	$120,381.0
TOTAL	$175,263.0	$146,405.0	$120,253.0	$174,016.0	$143,284.0	$250,015.0
Wildlife Habitat Restoration/Improvements Without Partners						
Projects	3.0	5.0	7.0	9.0	7.0	6.0
Acres	80.0	155.0	2,024.0	10,553.0	1,604.0	3,465.0
Forest Service Dollars	$78,400.0	$41,420.0	$150,176.0	$251,314.0	$143,874.0	$153,389.0

Source: Malheur National Forest – Forest Facts

The data shows that restoration has been an increasingly active venture for the Malheur NF, especially both wildlife and fisheries restoration projects collaborated with partners. Wildlife restoration with partners has been at least as active as restoration without partners and in most years had more projects completed. The wildlife projects with partners have also shown to be able to leverage more dollars for the project because of the increase in the amount of project participants. Because of the projects with partners, almost 55,000 acres were able to have wildlife restoration projects completed on them. Over time, the number of projects and especially prevalent, the scale of the projects completed has increased over time. In 2004, 784-acres were restored/improved with partners and in 2009 that number had increased to 28,150-acres restored or improved.

When we look at habitat restoration/improvements for fisheries, the number of projects and the scale of the projects follows a similar pattern as wildlife. Table 4: Fisheries Habitat Restoration/Improvements on the Malheur NF (2004-2009) shows the available data. Over the years with the available data, the number of projects completed with partners has increased from four projects in 2004 to seven projects in 2009. The total costs of these projects also follows a similar pattern, with $107,065 spent on restoration projects in 2004, and over $1.2 million spent in 2009, although this year saw exceptionally large spending. This was with the support of $939,500 coming from partners of the national forest and $185,635 worth of in-kind support.

Table 4: Fisheries Habitat Restoration/Improvements on the Malheur NF (2004-2009)

	2004	2005	2006	2007	2008	2009
Fisheries Habitat Restoration/Improvements With Partners						
Projects	4.0	2.0	3.0	3.0	5.0	7.0
Miles	7.7	2.5	9.0	3.0	18.0	188.0
Forest Service Dollars	$32,515.0	$9,900.0	$15,035.0	$1,092.0	$34,502.0	$105,244.0
Partner Dollars	$43,200.0	$0.0	$1,400.0	$1,000.0	$500.0	$939,500.0
Partner In-kind Value	$31,350.0	$5,745.0	$8,709.0	$0.0	$122,400.0	$185,635.0
TOTAL	$107,065.0	$15,645.0	$25,144.0	$2,092.0	$157,402.0	$1,230,379.0
Fisheries Habitat Restoration/Improvements Without Partners						
Projects	3.0	2.0	6.0	12.0	17.0	1.0
Miles	1.0	1.0	3.3	4.4	X	X
Forest Service Dollars	$72,100.0	$27,400.0	$130,611.0	$211,732.0	$143,785.0	$183,216.0

Source: Malheur National Forest – Forest Facts

Even without the support of local partners, the Malheur continues to spend increasing amounts of money to restore both wildlife and fisheries habitats around the forest. This comes as other industries have seen declines in the number of sales and the total volume. With ecosystem restoration continuing to gain public and financial support, these activities may continue to be a driver for many in the community.

Interviews with area timber industry stakeholders showed that there is a high level of interest in participating in restoration activities. They see these activities as a potential way to fill parts of the gaps left from the declining timber industry. Often many of the same companies that historically were involved in resource extraction are able to shift their focuses to restoration. Some interviewed felt that especially in rural areas like Grant and Harney County, the potential for restoration is even higher because of the amount of federal land and the relatively small population. They felt that each dollar spent in these areas had greater potential to directly impact the forest, as well as the livelihood of those residents in the adjacent communities. Those inside and outside of the area felt that each

job in Grant and Harney County could make a big difference in the area. These areas are also in some of the highest need of restoration because according to many the historic activities, although unintentional, degraded many parts of the area. There is also a high concentration of roads and areas with past grazing problems that have the potential for restoration. Others also see the potential in restoration, but feel that restoration needs to be passive without the interference of exotic species and human controlled elements. In general however, almost everyone interviewed felt that restoration could play a large part of the future economy in and around the Malheur National Forest.

Recreational Activities

On the Malheur National Forest, recreational activities encompass a broad range of activities each with different impacts in the local economies. In the last seven years the Malheur National Forest has participated in the National Visitor Use Monitoring (NVUM) project, conducting surveys and monitoring recreational use on the forest. This was a response to better understand the levels of use and the importance of forest system

recreational activities. On the Malheur, the NVUM project was completed in 2004 with data from fiscal year 2003, with a second follow-up survey using data from fiscal year 2009. Unfortunately these surveys utilized different methods for collecting the data, making comparison in uses between these periods difficult to accomplish with significant amounts of certainty. The 2003 data was a beta-test of the methods and approach to measuring visitation on the Malheur National Forest and other National Forests around the country. At the same time, trends seen in both the 2003 data and the 2009 data will

provide a good indication of the aspects of the Malheur NF that are used more extensively by recreationists.

In the National Visitor Use Monitoring projects, forest recreational sites and areas were categorized into five site types; Day Use Developed Sites (DUDS), Overnight Use Developed Sites (OUDS), Wilderness (WILD), General Forest Areas (GFA), and View Corridors (VC). Since only the first four site types represent actual visits to the national forest, the last site type (VC) was not included in the data. Within the NVUM data, estimates for specific sites within the forest are not considered to be reliable, however data at the forest level are considered to be more dependable by the reports authors. This data also does not represent the use patterns of potential visitors or previous visitors who no longer use the forest because of a lack of amenities or resources (Malheur National Forest 2004).

In the NVUM report from 2004, visit estimates to the forest were impacted not only by the sampling constraints, but also by several natural occurrences that most likely impacted use of the Malheur by recreationists. During the sample year, the forest experienced several large wildfires, closing the Strawberry Mountain Wilderness and the Monument Rock Wilderness areas, as well as other undeveloped, non-wilderness areas of the forest. The potential for fire also restricted the opportunities for cutting firewood, which was noted by the lack of users by forest employees. This change in the ecosystem also reduced the harvest potential for mushroom pickers. In addition, the Oregon Department of Fish and Wildlife (ODFW) changed the major hunting season dates

without notice. Because of this change, surveys that were meant to capture hunters fell outside of the hunting season, undercounting times of the year that typically experience the highest volume of use (Malheur National Forest 2004).

Estimations of recreation visitors during the first cycle of the NVUM reporting indicated that there were 422,666 visits to the Malheur National Forest with an 80% confidence level of 26.4%. During the visit to the national forest, there were 545,099 visits to different sites within the forest, an average of 1.17 sites per visit (Malheur National Forest 2004). Of those visitors to the DUDS, OUDS, WILD and GFA sites, 468 successful interviews were conducted providing a more in depth understanding of the types of activities visitors were participating in, as well as demographic information of the visitor and the people in their party. Of those who demographic data was collected, 75% were male and 25% female (Malheur National Forest 2004).

Table 5: Age Distribution of Malheur NF Recreation Visitors (2003 & 2009)

Age Class	Percentage of Visitors 2003	Percentage of Visitors 2009
Under 16	22.49%	21.7%
16-19	0.04%	0.8%
20-29	1.95%	6.5%
30-39	12.48%	12.3%
40-49	19.61%	19.5%
50-59	22.4%	24.1%
60-69	12.95%	13.1%
70+	8.07%	2.1%

Source: National Visitor Use Monitoring Results, June 2004, Malheur N.F.

The ages of the recreational visitors had the majority of people in three groups; Under 16, 40-49, and 50-59, representing almost 65% of the total visitors to the forest. Table 5: Age Distribution of Malheur NF Recreation Visitors (2003 & 2009) shows the age distribution of visitors to the Malheur National Forest for the 2003 data. The racial/ethnic profile of the visitors was generally representative of the area with 97.1% of the visitors indicating White, 0.1%

Hispanic or Latino, 3.3% Native American, 0% African American, 0.1% Asian and 0% Pacific Islander (Malheur National Forest 2004). Visitors to the forest were also generally from communities directly adjacent to the forest, with John Day, Prairie City, Burns, Mt. Vernon, Hines, Canyon City and Seneca representing 34% of all the recreational visitors to the forest. Other areas with high visitation to the area included the Bend/Redmond, Oregon area with slightly under 6% of the visitors. Other areas with a recreational visit to the forest include the Portland, Oregon area, as well as Boise, Idaho (Malheur National Forest 2004). The NVUM report also looked at the description of the visits, time spent as well as activities visitors participated in. Generally visitors stayed on the forest for almost 35 hours per visit and over half stayed overnight as a part of their trip to the forest. The length of the visit varied greatly based on the area of the forest they were visiting.

Table 6: Activities Visitors Participated in During Visit (2003)

Activity	Percentage Participating	Percentage Participating as Main Activity
Visiting Historic Sites	1.82	0
Nature Center Activities	0.86	0
Nature Study	3.65	0
Snowmobiling	0	0
Motorized Water Activities	0.97	0
Other Motorized Activities	0.02	0
Bicycling	1.19	0
Downhill Skiing	0	0
Cross-Country Skiing	0.01	0.01
Non-motorized Water	2.85	0.1
Primitive Camping	11.37	0.18
Resort Use	0.53	0.4
Other Non-Motorized	1.06	0.49
Horseback Riding	2.02	1.26
Picnicking	9.47	2
OHV Use	6.25	2.14
Developed Camping	16.17	4.17
Viewing natural Features	61.21	4.55
Backpacking	8.78	4.86
Fishing	16.47	4.86
Hiking/Walking	53.9	6.31
Viewing Wildlife	78.95	8.03
Gathering Forest Products	26.76	10.47
Relaxing	62.15	11.34
Driving for Pleasure	62.37	19.45
Hunting	27.97	19.68

Source: National Visitor Use Monitoring Results, June 2004, Malheur N.F.

Visitors at developed day use sites (DUDS) only stayed an average of 2.6 hours, followed by wilderness (WILD) visitors who stayed an average of 12.1 hours. In the general forest area (GFA), visitors generally stayed for 26.5 hours and the visitors that stayed the longest were those utilizing the developed overnight areas (OUDS) (Malheur National Forest 2004).

Activities that visitors participated in were collected in two categories for the NVUM. First they asked if visitors were participating in an activity and then if that activity was their main reason for recreating in the forest. For example, over 60% of visitors to the forest indicated driving for pleasure as an activity they participated in, but less than 20% indicated it was their main activity. Table 6: Activities Visitors Participated in During Visit (2003) shows the activities that visitors indicated that they participated in, and those activities that were their main activity during their visit to the Malheur.

Of those who visited in 2003, additional questions about their spending and general recreational habits were also collected. Over 60% of those who visited the Malheur indicated that the forest was their primary destination. Of those who were more than 50 miles from their homes, the average stay in the forest or the area lasted 2.6 nights. Spending directly related to the trip in question was not collected, but outdoor recreational spending information was gathered. A slight majority of people spent less than $1,000 on outdoor recreation, with just over 30% spending between $1,000 and $3,000. Only approximately 2% of those interviewed indicated that they spent over $10,000 on outdoor recreation in the past year (Malheur National Forest 2004).

In 2010 the Malheur National Forest updated their monitoring methodology and conducted their second NVUM project with data from 2009. Because of differences in methodology and reporting accuracy, comparison between the two reports is limited. During this cycle, overall visitation numbers had declined since the 2004 report. However interviews with recreational specialists working for the Forest Service indicated that they believe the numbers in the 2004 report are more accurate.

Visitation numbers by site type were also calculated in the 2010 report. Total visitors were estimated at 269,600 site visits on the Malheur during the year. An estimated 14,700 visits were made to Day Use Developed Sites (DUDS), 55,000 visits to Overnight Use Developed Sites (OUDS), 194,800 visits to the General Forest Areas (GFA) and 5,200 visits the Wilderness (WILD). Individuals were contacted for interviews during the survey periods and 592 individuals agreed to be interviewed about their visit (Malheur National Forest 2010).

Demographically, the sample appeared to be relatively similar to the 2004 report. Over 70% of those who were interviewed and the people in their party were male, and just under 30% were female. Racial backgrounds and ethnicity remained consistent with 99%

responding to be white, 4.4% responding to American Indian/Alaska Native, <1% Asian, <1% Black/African American, <1% Native Hawaiian or other Pacific Islander and <1% Spanish, Hispanic or Latino. The age breakdown was similar to the 2004 report also,

with the results also shown in Table 5: Age Distribution of Malheur NF Recreation Visitors (2003 & 2009) (Malheur National Forest 2010).

In 2009, the NVUM asked what zip code visitors were from. Again, results between the 2003 data and the 2009 data were similar. From the 2003 data we saw that approximately 34% of visitors were from adjacent communities and in 2009 this was slightly higher at 38% of visitors from the same adjacent communities. However, when visitors were asked where they came from, almost 55% of the respondents had traveled between 101 and 500 miles to visit the Malheur NF (Malheur National Forest 2010). Time spent at each of the different types of forest sites (DUDS, OUDS, GFA, WILD) had changed slightly between 2003 and 2009, with General Forest Areas now with the highest average trip at 73.5 hours from 26.5 hours and Overnight Use Developed sites moving to 45.8 hours from 89 hours (Malheur National Forest 2010). This could be because of the change in methodology, the lack of surveys during hunting season in the 2003 data, or a change in recreation behavior.

Activities in the forest also remained relatively the same through both the years. Hunting was still the most popular reason that people recreated on the Malheur, though the percentage who indicated this as their main activity doubled to 41%. At the same time, driving for pleasure, hiking/walking, viewing wildlife, relaxing, viewing natural features, and both developed and primitive camping were top recreational activities (Malheur National Forest 2010). Table 7: Activities Visitors Participated in During Visit (2009)

Table 7: Activities Visitors Participated in During Visit (2009)

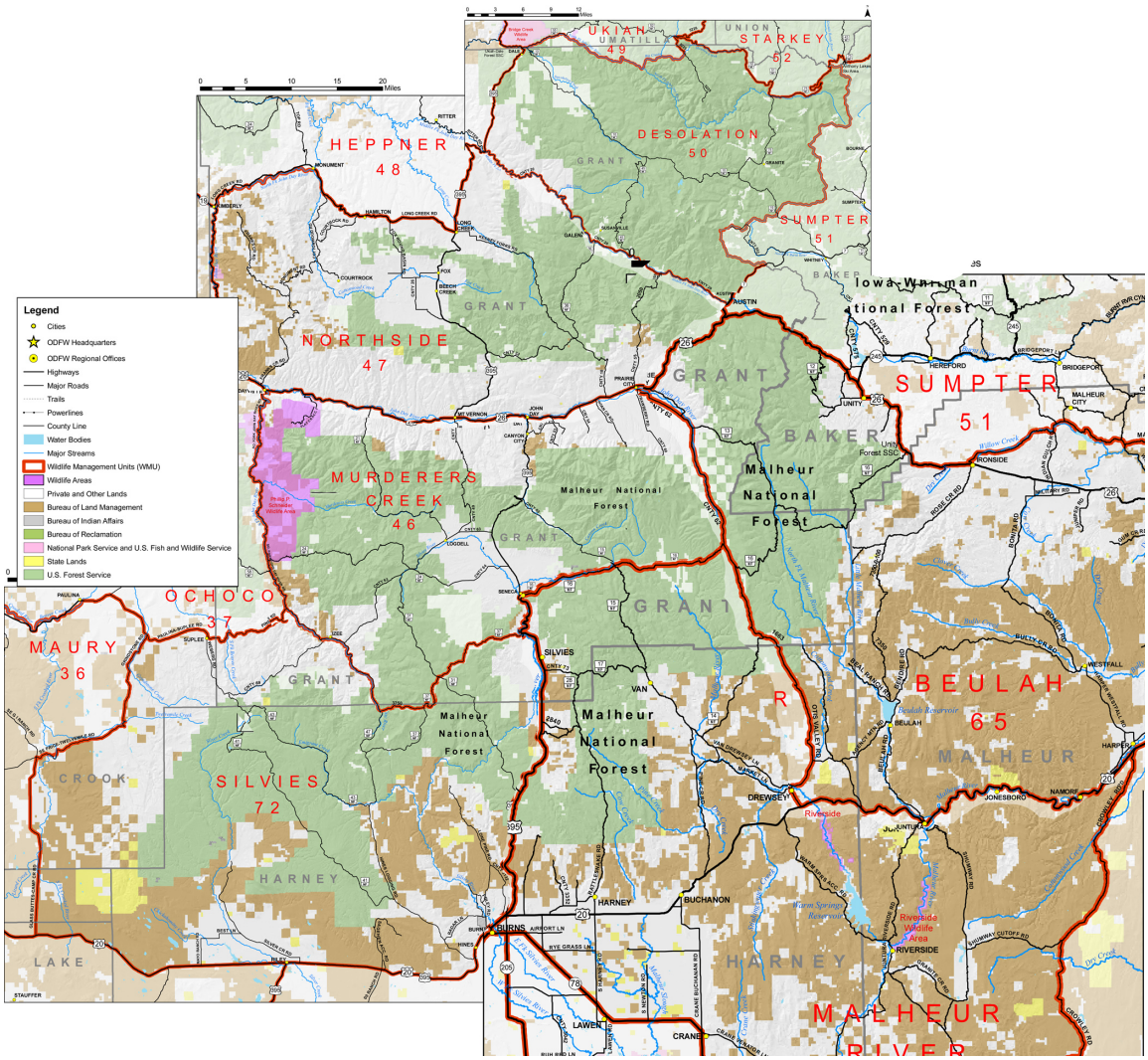
Activity	Percentage Participating	Percentage as Main Activity	Average Hours Spent in primary Activity
Downhill Skiing	0	0	0
Cross-Country Skiing	0	0	0
Other Motorized Activities	0.3	0	0
Nature Center Activities	0.9	0	0
Visiting Historic Sites	3.6	0	0
Nature Study	5.3	0	0
Motorized Trail Activity	13.2	0	0
OHV Use	14.9	0	0
Resort Use	0.2	0.1	23.8
Non-motorized Water	0.5	0.1	3
Bicycling	3.3	0.1	9.4
Backpacking	1.1	0.2	25.3
Other Non-Motorized	1.6	0.5	2.2
Motorized Water Activity	0	0.6	3.8
Picnicking	22.3	0.8	11.9
Viewing Wildlife	39.3	1.3	15.2
Fishing	11	1.5	8.2
Gathering Forest Products	6.5	1.8	2.7
Horseback Riding	2.5	2.2	1.9
Some Other Activity	3.7	3.5	8.2
Relaxing	38.3	3.6	14.7
Developed Camping	16.2	5.9	16.5
Driving for Pleasure	43.4	7.6	5.6
Snowmobiling	8	8	4.6
Primitive Camping	37.8	8.2	35.5
Viewing natural Features	32.6	8.3	4.7
Hiking/Walking	47.3	10	3.5
Hunting	49.7	40.7	57.8

Source: National Visitor Use Monitoring Results, June 20010, Malheur N.F.

shows the complete list of the activities participated in, the percentage as the main activity as well as how many hours they spent in their primary activity.

As seen in Table 7, hunting is a considerable contributor to the recreation activities in the Malheur National Forest. Because of the amount of hunters, additional information about hunters home location is important to understand the economic roll that hunting plays in Grant and Harney County. Beulah, Desolation, Malheur River, Murderers Creek, Northside and Silvies units were analyzed and these hunters represented 830 different zip codes. However 84% of the total number of hunters was represented by only 20% of the zip codes. In total there were 17,288 controlled hunting tags for the units, and the top 20% of the zip codes represented 14,683 hunters. These hunters were from an average of 221 miles away from John Day, OR with a standard deviation of 83. All of these hunters also were from the state of Oregon. However it is important to note that these hunters did not necessarily pass through John Day since the units looked at encompass an area larger than the Malheur National Forest as seen in Figure 7: Map of ODFW Hunting Units and Malheur National Forest.

Figure 7: Map of ODFW Hunting Units and Malheur National Forest



In 2009 the Malheur also collected additional economic information from the interviews, including household income and average spending per trip. As shown in Table 8: Reported Household Income of Visitors (2009) the income profiles of visitors to the Malheur distributed between $25,000 – $74,999 were almost 50% of the visitors to the forest. Visitors with a household income between $100,000 – $149,999 were also a large portion of the total number of recreationists visiting the Malheur, representing 36.9% of

the total number of visitors (Malheur National Forest 2010). While on the forest, average spending per visiting party was $265, although the median total trip spending per visiting party was only $150 (Malheur National Forest 2010). This large difference between the average and the median show that there are also a large portion of visitors that spend much less then the average, but that there are also some visitors who spend considerably more. Further information about the spending profiles on the Malheur was not collected.

Table 8: Reported Household Income of Visitors (2009)

Household Income Category ($)	Percentage Reporting
Under 25,000	6.7%
25,000-49,999	30.7%
50,000-74,999	18.6%
75,000-99,999	6.9%
100,000-149,999	36.9%
150,000 and Over	0.2%

Source: National Visitor Use Monitoring Results, June 20010, Malheur N.F.

From the data compiled by the Malheur NF and 118 other administration national forests, grasslands and recreational areas that were sampled, national spending profiles were established for different recreational activities. This report, *Spending Profiles of National Forest Visitors, NVUM Four Year Report* published in 2005, outlined spending profiles within 50 miles of the forest for different types of trips by local and non-local visitors, as well as those whose primary purpose was not recreation on the forest. Within local and non-local visitors data was split into day trips, staying overnight on the NF, and staying overnight off the NF.

Generally, the percentage of visitors from local areas visiting national forests around the country were similar to the results experienced on the Malheur, with 46% of the respondents being from local areas nationally and approximately 38% locally on the Malheur in 2009. This report asked and analyzed their spending habits by category while

visiting national forests. The results were grouped into non-local, local, and non-primary visits to the forest. Within non-local and local, they were segmented into day trips (day), overnight trips staying on the national forest (OVN-NF) and overnight trips staying within 50 miles of the interview site. Table 9: National Forest Visitor Spending Profiles by Trip Type Segment and Spending Category, $ per party trip (2003 dollars) includes the data for each of the trip types and spending habits (Stynes and White 2005).

Table 9: National Forest Visitor Spending Profiles by Trip Type Segment and Spending Category, $ per party trip (2003 dollars)

Spending Category	Non-Local Segments			Local-Segments			Non-Primary	All Visits
	Day	Overnight on N.F.	Overnight within 50 miles	Day	Overnight on N.F.	Overnight within 50 miles		
Lodging	$0.00	$25.30	$64.85	$0.00	$16.24	$17.62	$48.78	$19.71
Restaurant	13.60	25.26	58.91	6.12	13.61	21.49	44.80	22.32
Groceries	7.61	36.55	31.28	5.41	41.15	23.46	21.04	17.18
Gas & Oil	15.99	37.28	35.79	11.67	27.70	25.93	28.52	21.53
Other Transportation	0.98	3.00	7.54	0.21	0.21	1.09	5.10	2.26
Activities	3.87	8.04	15.49	1.82	3.80	6.76	9.67	6.03
Admissions/ Fees	5.24	10.23	9.02	3.42	10.54	8.37	6.97	6.13
Souvenirs/ Other	4.31	15.59	22.37	4.20	11.24	11.42	18.64	10.40
Total	**$51.60**	**$161.25**	**$245.25**	**$32.85**	**$124.49**	**$116.14**	**$183.52**	**$105.57**

Source: Spending Profiles of National Forest Visitors, NVUM Four Year Report

The results show that spending by non-local visitors is generally higher than local visitors for the same spending activity. Visitors who spent the day only recreating spent the least amount during their stay for both non-local and local visitors, with overnight trips on the forest spending significantly more. Local visitors staying off of the national forest spent slightly less than those staying on the national forest, likely the increase in on-forest overnight trips is based on camping fees. For non-local visitors, their spending when staying off of the national forest increased greatly compared to those who stayed on the

national forest. This is likely because of the higher costs of hotel or other accommodations compared to the minimal costs of camping fees.

The Stynes and White report also looked at spending profiles for particular activities in the national forests. Table 10: Spending Averages by Primary Activity and Segment, $ per party trip (2003 dollars) shows the results of their survey. In almost all instances, non-local visitors to the forest spent more in the area than those who live locally.

Table 10: Spending Averages by Primary Activity and Segment, $ per party trip (2003 dollars)

Spending Category	Non-Local Segments			Local-Segments			Non-Primary	All Visits
	Day	Overnight on N.F.	Overnight within 50 miles	Day	Overnight on N.F.	Overnight within 50 miles		
Biking	$	$	$343	$20	$	$	$	$78
Boating		158	288	52	100			108
Cross-Country Skiing			346	34				105
Developed Camping		140	146		128	127	117	131
Downhill Skiing	80		331	53		129		136
Driving	40		166	24			129	71
Fishing	42	205	238	42	135	99	225	108
General/Relaxing	46	158	245	33	125	148	146	118
Hunting	44	201	250	51	174	130		122
Multiple Activities			173	36			152	98
Nature-Related	52	213	225	27		134	190	121
No Primary Activity		138	252	42	100		190	119
OHV Use	62	147	182	38	114			89
Other		135	222	31			161	88
Other Non-Motorized	43	163	262	31				70
Picnic	59			38				73
Primitive Camping/Backpacking		105	104		93	99		99
Resort								222
Snowmobile	108		343	68				157
National Average	**$52**	**$161**	**$245**	**$33**	**$124**	**$116**	**$184**	**$106**

Source: Spending Profiles of National Forest Visitors, NVUM Four Year Report

From this survey, certain activities are shown to increase the amount of spending visitors to the forest spend during their trip. Resort activities generated the most spending,

followed by snowmobiling, developed camping, hunting, general/relaxing are the top five activities based on the spending for the entire visit. Similar to the spending profile by spending category in Table 9, non-local visitors participating in almost all activities spent the most compared to other non-local and local categories, regardless of activity. For example, visitors who participated in fishing and did not stay on the national forest spent on average $238, while local visitors only spent $99. The increased costs of lodging and potential spending on food at restaurants and grocery stores are the probable reason.

While Table 9 and Table 10 are based on national data, the results show that there is a significant amount of spending in the local area by recreationists visiting the forest. This should be realized on the Malheur and in the nearby communities because of the more isolated location of the forest to larger cities. At the same time, several recreationists and area residents interviewed indicated that it is common for non-local visitors to bring supplies from outside of the area, potentially because of a lack of locally available amenities.

ECOSYSTEM SERVICES

At a national level, the Forest Service has begun to look into the ecosystem services that are provided on the national forests across the country. Established in 2008, the Office of Environmental Markets (OEM) has been tasked with approaching this for the US Department of Agriculture. The Forest Service has said that these public goods are traditionally viewed as free benefits to society lack formal markets and are absent from the balance sheet. This undervaluing of the forests can make them susceptible to

development pressures and conversion. Because of this, the Forest Service is beginning to explore opportunities for markets and payments for ecosystem services (USDA Forest Service 2007). In 2010, Agriculture Secretary Tom Vilsack expanded the function of OEM to support the development of emerging markets for carbon, water quality, wetlands and biodiversity (US Department of Agriculture 2010).

The Office of Environmental Markets has not yet determined if the Forest Service would utilize all national forests, or utilize other selection criteria into their determination of what would be considered for the ecosystem services market. When the topic of ecosystem service markets was discussed with interviewees, there was a mixed reaction to the its potential. Some felt that by valuing the natural resources, it would help protect them and increase opportunities for other non-extractive markets. Some also felt that while preserving the ecosystems was a positive move, putting these goods and services into markets could also make them more vulnerable to future damage. They felt that by trying to incorporate nature into capitalistic markets, certain services would be undervalued and therefore would undervalue the entire ecosystem market, increasing the degradation of the national forests. On the other hand, some worry that the services and materials in the forest could be overvalued, making any extractive products too expensive to match markets for wood products, reducing the amount of jobs in the area. However, until the Forest Service begins to actively prepare to engage in these markets, the impacts on the natural resources and the local economy will be difficult to estimate.

SUMMARY OF FINDINGS

These findings show that while some of the activities analyzed are livelier in Grant and Harney County than others, all of the activities are currently being pursued in some fashion. The community, businesses, local, state and federal government are beginning to capitalize on these opportunities. To varying degrees each of the components of the new natural resource economy is taking hold, both voluntarily and through necessity as area entrepreneurs look to capture new revenue streams. Expanding on these trends and opportunities will be the next step in supporting the regional economy.

V. Conclusions and Recommendations

Summary

As traditional forest management shifts from resource extraction dependant activities to a more ecosystem-centered approach, many communities are struggling to fill the gaps left in jobs and wealth that were formerly provided by the previous industries. Data and interviews have shown that over the last twenty years that the main economic base for the communities around the Malheur National Forest have been following this trend, shifting away from resource extraction to one that manages the natural resources for ecosystem health objectives. These traditional businesses are operating at much lower levels than in the 1980's and 1990's, creating a need for communities to supplement traditional economic activities. This change has shifted how many business and industries in the region operate, in some cases opening the door for new activities in the forest. Area residents are slowly adopting new economic activities as other opportunities are shifting or changing management objectives. These activities are slowly becoming a larger part of the local economy, annually increasing in their importance.

Conclusion

With the current high levels of joblessness, as well as the sentiment in the community, the new natural resource economy does not have the ability to replace the economic support previously provided by timber extraction. Over time however, the NNRE has

become an increasingly large provider of jobs and economic support for the local community. With management objectives continuing along the current trend, the impacts of these activities will continue to rise.

Traditional forest products are no longer as profitable or at the same scale as years past, however there are still opportunities for these activities in the national forest. The new face of timber production is at a smaller scale, and with a more diverse approach to harvesting techniques. Non-traditional forest products have also increased in their importance to local communities over time, although their impact is less understood. However, many families are hunting and using other forest products to supplement their household needs. Ranching in the region is also changing, with ranchers and the Forest Service also concerned with whole forest health and the impacts of ranching on streams and vegetation. New ranching activities are more regulated and ranchers are more active in the management of their cattle. Restoration of the forests land and water has, over time, proved to be important focal areas. Local businesses have seen the potential economic support that restoration has and are diversifying activities to supplement their traditional focal areas. Recreation is a second area with additional future potential for communities adjacent to the national forest, with recreational spending increasing and nature based recreation activities increasing in popularity.

With all of the new natural resource economy activities, the change is occurring slowly on the Malheur National Forest. At the same time, this diversification is becoming increasingly important as traditional economic drivers decline. Given the available data

and the findings reported, what opportunities are available for regional stakeholders to encourage and develop this emerging industry?

Recommendations for National Forest Managers

The Forest Services continued dedication to the forest community is evident in the amount of time and effort made to improve forest conditions. Many of the people interviewed both inside and outside of the natural resource industries indicated that the current trends in forest management are positive for the overall health of the forest. There was debate over the scope and scale of projects, but consensus is that the process is time consuming and could be more effective. Those interviewed believed that this delay of projects over time has caused forest conditions to improve in some areas allowing for passive restoration, but decline in others where forest density and fire potential are at their extreme.

The Malheur National Forest should continue to manage the National Forest for a wide range of purposes focusing on ecosystem health and providing employment and economic development to the local community. The Forest Service should also look for ways increase their ability to develop and implement projects on the forest.

One way to increase the development of these types of projects would be to monitor more closely the amount of products being harvested on the forest. There are a wide variety of non-traditional forest products that area residents use to support either a business or a family. There has been long term monitoring of the traditional forest products the forest

produces. By establishing protocol and monitoring the volume and impacts of non-traditional products, the forest will be in a better position to fully quantify and develop these markets, as well as show the impacts that the Malheur National Forest has in supporting local economic development. This could also improve in the community through additional public outreach of the types of services that that the Malheur as well as the Forest Service can provide area residents. From the hunting opportunities, to the non-traditional forest products and how restoration can improve the lives of those in the region, the Malheur provides many benefits to area residents. Capitalizing on these uses and encouraging more use of the forests many products and services can help ease community tensions as well as establish more connected relationships with these residents.

A second way to help mature these markets and the activities involved is to support and develop branding in the region for the products the forest produces. Private industries in the region have had success with Country Natural Beef, branding and selling beef products to consumers based on the quality of the product and the marketing approach. Copper River Salmon are also highly prized for similar reasons. Both of these products show the opportunity for products that are harvested on the forest. Malheur Mushrooms, High Country Lumber, or other such branding ideas have potential as consumers look to be increasingly connected with the products they purchase. Developing these markets also has the potential to help supplement other industries to develop in the region and support increases in the tourism.

Working with collaborative groups to increase the efficiency, stability and speed at which projects can be developed and implemented will continue to be an effective means as changes in management objectives shift over time.

Recommendations for Collaborative Groups

Collaboration between the Forest Service and local stakeholders is an important aspect of current forest management. It will be essential to continue engaging local residents in helping develop and outline the direction of management within our public lands. These groups should look to continue to develop projects with the Malheur to help expedite the planning process and reduce litigation potential. Embarking on new projects regularly will also help to get more projects implemented, supporting local businesses that support these activities, as well as their suppliers.

Collaboration groups have the ability to help projects move more efficiently through the planning process, which can help develop a more steady and dependable supply of forest products for area businesses. By developing a steady supply, this will help reduce the boom and bust cycles experienced year to year and will help establish steady markets for area businesses.

At the same time, it is important to continue incorporating a diverse membership to fully represent the ideas and opinions of stakeholders. By continuing to collaborate on forest projects, the Forest Service will be able to implement additional projects providing for additional work on the ground and also restoring ecosystems to historical levels.

Recommendations for Local Economic Development

With management of the national forests likely to continue in the current direction, it will be increasingly important to look for alternative activities to support the economic base of the area communities. New opportunities are emerging as recreation and restoration are becoming more integrated into the Malheur NF. Outfitters, guided tours, and similar industries are allowing for new opportunities to engage non-local visitors. As the population of the United States is also aging, an increasing need for affordable, attractive vacation style retirement homes is likely to increase. With the array of recreational opportunities, medical facilities and affordable construction costs, the potential to establish these types of facilities in the region is high. This would help support local development, as well as drive recreational spending for area businesses, potentially bringing in additional new businesses. This model could also be considered for seasonal vacation style communities to establish in the region. By marketing the positive aspects of the region and building

Existing companies should look at diversification of activities and the development of non-resource extractive businesses to help residents provide economic support. Successful examples of this diversification are being found throughout the area. Examples include the development of the pellet mill by a lumber company and timber companies that are also starting to specialize in restoration construction. This diversification will continue to be important as forest managers look for landscape wide restoration and land management.

Local communities should also continue to incorporate recreational goods and services into their focus, as these activities will become increasingly popular throughout the nation. The development of new industries in the region is also a possibility. However, infrastructure limitations need to be addressed before any large-scale industries locate in the area. Low housing costs, recreational opportunities, good health care and a strong sense of community help improve livability in the region. By approaching and building on the strengths of the region and its resources, new local economic development has the potential to thrive.

Recommendations for Further Research

Because of the scope and scale of this study, it is important to conduct similar studies on additional forests around the country. This would provide a better understanding of how typical the Malheur NF and these activities are on other national forests in eastern Oregon and nationwide. Additional studies on the direction National Forests are taking resource management will help better understand the shifting dynamics that communities around national forests will play in the future. If additional time and resources are available, a more in-depth approach should be taken. Additional time would allow for a more comprehensive look at the impacts of the new natural resource economy historically and presently, analyzing data from additional years and sources. This could look to understand the spending profiles of recreationists on the Malheur NF and how this compares with national profiles. Additional interviews with resource industry representatives and area businesses would be able to understand the actual impact of

restoration activities for local businesses. From this we could hope to understand if the specialization in this developing area warrants the time and money investment required, or if businesses outside of the region are capturing this market. Through the understanding of these aspects and the careful investigation of where further opportunities lie, residents can begin to take additional advantage of current trends.

By actively engaging in the shifting direction of management on the Malheur National Forest and adjusting to trends in activities and spending, opportunities exist for the new natural resource economy to support economic development and growth in the region.

VI. BIBLIOGRAPHY

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