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Socio-Economic Report

Westside Fire Recovery Project

Happy Camp/Oak Knoll and Salmon/Scott River Ranger Districts, Klamath National Forest
Siskiyou County, California

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Executive Summary

The purpose of this report is to analyze the effects of the Westside Fire Recovery project on rural social and economic health, and identify any disproportionate effects to minorities and disadvantaged groups in Siskiyou County. Safety is an important value to people in Siskiyou County; therefore, one purpose of this analysis is to gain a better understanding of how safety relates to the purpose and need of this project and its proposed actions. In particular, how safety of local residents, the recreating public, and forest workers such as firefighters and planting contractors are affected by the treatments being proposed.

Methodology

Social

Information from federal data sources is used to compare the social status of Siskiyou County to the State of California and the United States to provide background information for effects of the project on minorities and disadvantaged groups. The Economic Profile System – Human Dimensions Toolbox which compiles statistics from federal data sources is used as a source of information for this analysis.

Economic

Economic effects are analyzed using information from a customized version of an input-output model that summarizes inter-industry production and consumption for each state and county in the United States (IMPLAN). Since the data sources and methods used by IMPLAN are approximations of reality that sometimes contain substantial departures relative to actual conditions in the state or county, a customized model was developed (SCFSM) in 2012. This model customizes the standard Siskiyou County IMPLAN model to provide a more reliable representation of Siskiyou County's forest sector. It was developed primarily to support defensible analysis of the economic impacts of national forest projects in Siskiyou County and is used in the analysis of the Westside Fire Recovery project. More information on both the SCFSM and IMPLAN models is provided in appendix A of this Socio-economic resource report.

Analysis Indicators

Social Environment

Social analysis is based on the quality of life of people affected by this project. Quality of life depends partly on the ability of people to sustain themselves and their families; that is analyzed in the economic portions of this document. The indicators used for the social analysis include lifestyles, values, beliefs, health and safety of individuals and communities. For this project, there are three measures for evaluating the effects of the project on quality of life for Siskiyou County residents:

- The value of using the resources of the Forest, and project area in particular, for the benefit of county residents (Siskiyou County Land and Resource Management Plan 1996). This will be analyzed using the estimated volume of timber products the alternatives will produce.

- Changes to the "fire-safe character of communities" in the project area. This will be analyzed using the acres of fuels treatments in each alternative. It is assumed that fuels treatments have the indirect effect of creating more fire-safe communities. Safety for Forest workers, firefighters and the public. This is estimated by the number of acres on which standing dead trees are removed by salvage harvest and by the number of miles and acres of roadside hazard trees removed (for those who use roads in and through the project area). Also see the discussion about resistance to control regarding fire suppression tactics in the Fire and Fuels section of chapter 3 of the draft EIS and the Fire and Fuels resource report.

Assumptions made in this analysis include that it is probable that any portion of the project area will be accessed by the public, firefighters or Forest workers. Hazard trees can directly harm a person or property but can also pose an indirect hazard such as blocking access to or from portions of the Forest or to major escape routes during storms or future wildfires.

Economic Environment

The Forest Plan includes a Forest-wide goal to promote the economic stability of local communities (Forest Plan page 4-9). Economic analysis indicators for this report are:

1) total economic outputs;
2) labor income (wages and proprietor's income);
3) number of jobs created;
4) revenue generated based on the estimated volume from timber sale units; and
5) estimated project revenue returned to Siskiyou County.

Spatial and Temporal Context

Siskiyou County is used as the spatial analysis area for social effects and for fiscal effects (timber receipts) because the project area is entirely within the county. The model used to analyze other economic effects takes into account impacts within a four-county area including Siskiyou, Shasta and Trinity counties in California and Jackson County in Oregon because the project's direct economic effects through the veneer manufacturing, logging, log hauling and forestry support services are realized through this larger area. The three fire-related project areas are used as the spatial analysis area for effects to safety because treatments proposed to improve safety are entirely within these project areas.

This analysis considers one to five years as the short-term time period for effects analysis on safety and other social and economic indicators. This temporal bounding approximates when treatments will be completed and most fire-killed trees are likely to fall, and when treatments will be completed and products from implementation will have entered the wood products market. Five to ten years is the long-term time period for effects analysis on safety and other social and economic effects.

Affected Environment

Social Environment

In terms of safety, the following conditions describe the affected environment:

- Trees killed or severely burned by wildfire (i.e. snags) are often unstable and at risk for falling or snapping off, especially during winter snow, rain, and high wind events.
- Infrastructure, including utility lines, roadways, bridges, trailheads, campgrounds, and fire lookouts within the project area, are surrounded by fire-killed and damaged trees and preexisting danger trees that pose a hazard to the public and Forest workers. As a result of the 2014 fires, infrastructure, including utility lines, roads, bridges, trailheads, campgrounds, and fire lookouts within the project area are surrounded by fire-killed and damaged trees and preexisting danger trees that pose a hazard to the public and Forest workers and restrict access. Almost 650 miles of roadways are affected.
- Dead and dying trees within proposed salvage harvest areas present a safety hazard to firefighters (should the area burn again) or others who may recreate or work in these areas.
- A high probability of future high-intensity wildfires (due to heavy fuel loading from existing fire-killed timber) threatens structures and presents a safety hazard to nearby residents and firefighters (should the area burn again). Progressively increasing fuel loads (where potential flame lengths exceed four feet) provides conditions in which fires are resistant to suppression tactics.

The closest communities to this project are the communities of Happy Camp, Seiad Valley, Yreka, Fort Jones, Etna, Klamath River, Scott Bar, Hamburg, and Sawyers Bar. Social effects of the project, including safety concerns, will be most noticeable in these communities and the surrounding rural areas of the county.

The Siskiyou County population consists of Caucasian, African American, American Indian, Hispanic, Asian, Native Hawaiian or Pacific Islander, and other races. The American Indian population is a greater percentage of the population in Siskiyou County than in the State of California; therefore, potential impacts of management actions on the American Indian population will be disclosed. A larger percentage of the population of Siskiyou County is unemployed or below the poverty line than in the state of California; the impacts of the project on low-income populations in Siskiyou County will also be disclosed.

Lifestyles, attitudes, beliefs and values of Siskiyou County residents are similar to those of rural residents in other counties in the western United States. Many local residents depend on the environment to support them, and they want forest products to be used for the benefit of the county. The concern regarding the fire-safe character of the communities in and adjacent to the project boundary and for the general safety of the public, forest workers and firefighters is addressed above. Conditions related to safety have changed in the last few years due to high intensity wildfires that have left many acres of the Forest in an unsafe condition and are of particular concern to communities within and adjacent to the project area boundaries.

Economic Environment

Labor income in Siskiyou County has held relatively constant since 1970; non-labor income has been on a steady rise.

From 1970 to 2011, employment grew from 14,085 to 20,224 jobs, a 44 percent increase over 1970. Since 1990, the annual unemployment rate ranged from a low of 7.5 percent in 2000 to a high of 16.6 percent in 2010. Siskiyou County unemployment rates tend to be higher than the rest of the United States.

In 1998, timber represented more than seven percent of total employment of Siskiyou County but by 2011, timber represented five percent of total employment, mirroring the trend in the United States as a whole. Jobs in the timber sector in the county decreased to 410 jobs in 2011. "Although National Forests account for more than 60 percent of the county's land base, the share of the county's timber harvest off federal lands has decreased from roughly 50 percent to less than 20 percent since the northern spotted owl was listed as threatened in 1990. Since 1990, the number of wood products manufacturing facilities in the county has declined by half" (Dennis 2012).

Siskiyou County has limited sawmilling (i.e., lumber production) capacity compared to the other counties in the four-county region. The main log-processing facilities in Siskiyou County are veneer mills. Siskiyou County's veneer mills typically purchase relatively low-value logs and may produce relatively high-value wood products compared to sawmills. More information on the economic environment is provided in the body of, and appendix to, this Socio-economic resource report.

Environmental Consequences

Alternative 1

Direct Effects and Indirect Effects

Social and Economic

Under this alternative no project treatment activities are proposed. The social effects of this alternative will be a continuation of the current distribution of jobs among racial and ethnic groups. Alternative 1 will not contribute to timber employment jobs and the county's economic situation will not be improved. There will be no disproportionate effects on American Indians or the poor.

The lifestyles, values and beliefs of the people in Siskiyou County will not be changed and the wish that resources of the Forest be used to benefit local residents will not be fulfilled. The concern regarding the fire-safe character of the communities will not be addressed because no project-related fuels treatments will be implemented.

The effect on safety of implementing alternative 1 will be that zero burned acres will be treated and zero miles of roadside hazard trees will be removed. This will increase the likelihood that forest workers, firefighters, or public users of Forest land will be injured by a fire-killed or hazard tree as time goes on and the trees deteriorate and fall down. Because no roadside hazard trees will be removed in this alternative, safe travel on roads within the fire area will be hindered year after year due to new trees falling into the roads or roads may need to be closed for various periods of time to assure public safety which will affect public access to the Forest. Fallen trees in the road may also delay the response of firefighting personnel to new wildland fires in and around the project area. Safety for Siskiyou County as a whole will decrease since the project area represents about 10% of the Siskiyou County land base.

Without treatment, hazards would not be abated around critical infrastructure.

- Salvage treatments would not be accomplished. Without salvage harvest, snags would continue to decay, break, and fall. This would increase surface fuel loading, which will

increase the severity and intensity of future fires. Increased fire intensities and dead and decaying standing trees would inhibit the effective control of future fires and/or put fire suppression crews at increased risk. (See fuels and vegetation sections in chapter 3 of the draft EIS.) Beyond the important safety concerns associated with fallen snags, deterioration of the fire-killed and damaged trees reduces the quality, merchantable volume and value of the lumber. The reduction in value affects the revenue the federal government receives from stumpage and also affects the ability to cost-effectively remove the dead trees. There are numerous examples of recent fires where timber went unsold and un-harvested because delay caused deterioration, rendering trees worthless in the marketplace. Ultimately, the cost of removal far exceeds the value of the trees, and the government is faced with the dilemma of an increasing fuel load and no funds available to mitigate the impact.

- Reforestation of burned forested areas would not be accomplished with this or any other project, since planting crews cannot safely operate in areas of dead and decaying standing trees. It is a violation of Office of Safety and Health Administration codes to plant or treat hazardous fuels under, or adjacent to, snags. Decay causes reductions in strength properties of wood, rendering the wood useless from a structural standpoint and thus decreasing useable log volume. In addition to the deterioration caused by stain, decay and insects, weather also contributes to loss. Weather checking is cracks that form vertically in the wood as trees die out. With time, cracks go deeper into logs and the portions of logs that are checking are unusable for manufacturing boards. Since there would also be fewer funds available from timber contract receipts, the opportunity to restore forested habitat through site preparation and reforestation work would be lost.
- In the short term, Forest workers such as firefighters, planters, researchers, and surveyors would either risk working in conditions that may subject them to injury or death from fallen snags or would not work in the areas because the areas would be deemed unsafe for work. In the long term, jack-strawed conditions from fallen snags would impede effective travel through areas of high to moderate severity burns, which would put workers at increased risk or eliminate their ability to work in the areas.
- In the short and long term, no treatment of hazard trees along roadways and nearby infrastructure would increase safety risks to forest workers and the public. The number of fallen snags along roadways would be innumerable –far too many to be addressed by fire crews and through permitted public fuelwood removal. To mitigate safety risks to the public, Forest Orders may be needed temporarily to close road access to portions of the Forest, which would impact public access (see the Recreation section of chapter 3 of the draft EIS and the Recreation resource report).
- In the long term, increased fire intensities and the continued existence of dead and decaying standing trees would inhibit the effective control of future fires and/or put fire suppression crews at increased risk. See the Fire and Fuels section of chapter 3 of the draft EIS and the Fire and Fuels resource report for details.

Cumulative Effects

Ongoing and foreseeable future actions in the project area are listed in appendix C of the draft EIS. Some projects, including projects with hazard tree and fuels treatments improve safety conditions for the public and forest worker. However, alternative 1 would not supplement other present and/or reasonably foreseeable future projects that are planned to improve safety across

the landscape. Additionally, because of access issues resulting from fallen snags along roadways, difficulties may preclude future projects from either continuing or being planned due to the high density of snags within or adjacent to the project area. Using fire as a management tool in both the planned (prescribed fire) and unplanned setting may not meet desired resource objectives due to future fuel loading potential as well as the hazard, cost and time needed to remove decaying hazard trees from planned control lines. This will be a limiting factor in future prescribed fire activities.

For cumulative social and economic effects of indicators other than safety, all current and reasonably foreseeable similar actions within Siskiyou County over the next five years were considered; for this analysis, it is assumed that actions in the four-county area will be similar to those in Siskiyou County. Future foreseeable actions on National Forest System land within Siskiyou County are available on the Forest Service Schedule of Proposed Actions website: http://www.fs.fed.us/sopa/. These projects include the Salmon Salvage, Two Bit, Jess, Hotelling Roadside Hazard, Crawford, McCollins LSR, Eastend, Craggy, and Lover's Canyon projects on the west side of the Forest, Big Pony, Ruffed Grouse, Butte Mountain, Little Deer, Landlord, Pumice, Six Shooter, and Harlan projects on the eastside of the Forest, and the Harris project on the Shasta Trinity National Forest. A list of planned Timber Harvest Plans for California can be found at: http://calfire.ca.gov/resource_mgt/resource_mgt_forestpractice_thpreviewprocess.php.

Since it is difficult if not impossible to obtain detailed information on the amount of harvest expected or the economic value of such harvest, it is assumed that timber harvest on private lands will continue at a rate similar to the past. There are also a number of salvage projects on private land covered by exemptions from requiring a timber harvest plan.

Implementation of alternative 1 will neither support nor add to the demand for timber industry jobs and its related industries employment. Adding the social and economic effects of these projects to the effects of alternative 1 will not result in substantial social or economic cumulative effects.

Alternative 2

Direct Effects and Indirect Effects

Social

The social effects of this alternative will include more jobs available for Siskiyou county residents from the 2,236 additional jobs provided and a continuation of the current distribution of jobs among racial and ethnic groups. There will be no disproportionate effects on American Indians or the poor.

The lifestyles, values and beliefs of the people in Siskiyou County will include some fulfillment of the desire that resources of the Forest be used to benefit local residents. The concern regarding the fire-safe character of the communities will be addressed through fuels treatments on ridges and near communities.

Treatments will improve safety conditions within the project area include roadside hazard treatments, hazardous fuels treatments, and salvage harvest treatments.

A majority of hazards along almost 650 miles of roads and other infrastructure, including campgrounds, fire lookouts, trailheads, bridges would be treated in 2015 prior to winter weather

operational restrictions. Since roadside hazard treatments are buffered to 250 feet on either side of the road, roadside hazard treatments incorporate bridges, campgrounds, fire lookouts, trailheads. Treatments will abate hazards along roadways and other infrastructure, improving safety conditions for the public and forest works and mitigating potential damages from falling fire-killed trees and other hazard trees. Hazard treatments along roadways are critical for providing safe and effective access for the public and forest workers. Treatments are also proposed along utility corridors where needed to protect infrastructure and improve conditions for fire suppression tactics. The removal of fire-killed trees and other hazard trees from around local communities, key infrastructure, and roads would also provide fire managers with improved options for effectively managing potential future wildfires.

Salvage harvest on 6,800 acres within 11,700 acres of salvage units would reduce safety hazards, promoting improved safety conditions for public and forest workers, including but not limited to firefighters, planters, and surveyors. By removing fire-killed trees before they fall and become "jack-strawed" and making foot travel feasible, safety conditions and suppression effectiveness for firefighters is improved.

Hazardous fuels treatments within fuel management zones (i.e. fuel breaks) and the wildland urban interface treatments also improve safety conditions of firefighters and improve suppression tactics around local communities, improving the safety conditions of local residents. Although fire plays an important role in the ecosystem, reducing these fuel loads minimizes the intensity and severity of future fires, thus improving the likelihood of firefighting success.

Proposed treatments decrease the likelihood that forest workers, firefighters, or public users of Forest land will be injured by a fire-killed or hazard tree as time goes on and the trees deteriorate and fall down. Safety for Siskiyou County as a whole will increase since the project area represents about 10% of the Siskiyou County land base.

Economic

Economic effects of alternative 2 include an economic output of $210,206,000, labor income value of $53,107,000, and employment increased by 1,236 jobs. Timber revenues from implementing this alternative are estimated at $11,892,000 and returns to Siskiyou County at $2,973,000 based on 25% of timber revenue receipts. Wholesale veneer value is estimated as $98,700,000, logging costs at $33,140,000 and hauling cost at $10,515,000. Required costs to restore the project landscape through site preparation, planting and fuels reduction are estimated as $36,460,000.

Cumulative Effects

As noted above, implementation of alternative 2 will have measureable social and economic effects on Siskiyou County; adding the social and economic effects of the ongoing and reasonable foreseeable future projects identified in alternative 1 to the effects of alternative 2 will result in noticeable social and economic cumulative effects, especially in the timber sector. Since this sector is such a small part of the economy of Siskiyou County, however, overall cumulative effects to the county are not expected to be substantial. In terms of safety, projects, especially those with hazard tree and fuels treatments, improve safety conditions for the public and forest workers. Treatments proposed in this project would supplement other present and/or reasonably foreseeable future projects that are planned to improve safety across the landscape. Roadside hazard treatments proposed in this project would provide access to other future projects within or

adjacent to the project area, providing access for treatments. Using fire as a management tool in both the planned (prescribed fire) and unplanned settings would meet desired resource objectives due to lower future fuel loading potential and fewer hazards, providing conditions to improve the likelihood of suppression effectiveness. See the Fire and Fuels section of chapter 3 of the draft EIS and the Fire and Fuels resource report for details.

Alternative 3

Direct Effects and Indirect Effects

Social

Social effects will be similar to those of alternative 2 except that (1) safety will be affected by 5,800 acres of salvage logging within 9,600 acres of salvage units; and (2) 1,067 jobs are expected to be created. Effects of this alternative to improving safety will be similar to alternative 2 except that 5,800 acres will have large fuels removed through salvage harvest.

Economic

Economic effects of alternative 3 include an economic output of $185,381,000, labor income value of $46,523,000, and employment increased by 1,067 jobs. Timber revenues from implementing this alternative are estimated at $9,851,000 and returns to Siskiyou County at $2,463,000 based on 25% of timber revenue receipts. Wholesale veneer value is estimated as $87,000,000, logging costs at $29,807,000 and hauling cost at $9,260,000. Required costs to restore the project landscape through site preparation, planting and fuels reduction are estimated as $29,310,000.

Cumulative Effects

As noted above, implementation of alternative 3 will have measureable social and economic effects on Siskiyou County; adding the social and economic effects of the ongoing and reasonable foreseeable future projects identified in alternative 1 to the effects of alternative 3 will result in noticeable social and economic cumulative effects, especially in the timber sector. Since this sector is such a small part of the economy of Siskiyou County, however, overall cumulative effects to the county are not expected to be substantial.

Alternative 4

Direct Effects and Indirect Effects

Social

Social effects will be similar to those of alternative 2 except (1) safety will be affected by 5,900 acres being salvage logged within 10,200 acres of salvage units; and (2) 1,074 jobs are expected to be created. Effects of this alternative to improving safety will be similar to alternative 2 except that 5,900 acres will have large fuels removed through salvage harvest and roadside hazard tree removal will occur along about 620 miles of road.

Economic

Economic effects of alternative 4 include an economic output of $189,564,000, labor income value of $47,338,000, and employment increased by 1,074 jobs. Timber revenues from implementing this alternative are estimated at $9,586,000 and returns to Siskiyou County at $2,396,000 based on 25% of timber revenue receipts. Wholesale veneer value is estimated as $88,900,000, logging costs at $30,940,000 and hauling cost at $9,463,000. Required costs to restore the project landscape through site preparation, planting and fuels reduction are estimated as $29,500,000.

Cumulative Effects

As noted above, implementation of alternative 4 will have measureable social and economic effects on Siskiyou County; adding the social and economic effects of the ongoing and reasonable foreseeable future projects identified in alternative 1 to the effects of alternative 4 will result in noticeable social and economic cumulative effects, especially in the timber sector Since this sector is such a small part of the economy of Siskiyou County, however, overall cumulative effects to the county are not expected to be substantial.

Alternative 5

Direct Effects and Indirect Effects

Social

Social effects will be similar to those of alternative 2 except that (1) safety will be affected by 1,900 acres being salvage logged within 3,400 acres of salvage units and an additional 1,200 acres adjacent to private property will have fuels reduced; and (2) 549 jobs are expected to be created.

Economic

Economic effects of alternative 5 include an economic output of $83,752,000, labor income value of $21,932,000, and employment increased by 549 jobs. Timber revenues from implementing this alternative are estimated at $6,334,000 and returns to Siskiyou County at $1,583,000 based on 25% of timber revenue receipts. Wholesale veneer value is estimated as $39,500,000, logging costs at $11,712,000 and hauling cost at $4,214,000. Required costs to restore the project landscape through site preparation, planting and fuels reduction are estimated as $25,802,000.

Cumulative Effects

As noted above, implementation of alternative 5 will have some social and economic effects on Siskiyou County; adding the social and economic effects of the ongoing and reasonable foreseeable future projects identified in alternative 1 to the effects of alternative 5 will result in social and economic cumulative effects, including some in the timber sector. However, overall cumulative effects to the county are not expected to be substantial.

Comparison of Effects

The project's economic effects on Siskiyou County and the four-county region will be largest under the alternative 2, about 12 percent smaller under alternatives 3 and 4, and about 50 percent

smaller under alternative 5. The relative contributions of timber harvesting and landscape restoration to the project's economic effects are given by their relative monetary values.

Table S-1 displays a comparison of the social and economic effects of alternatives.

Table S- 1: Comparison of Social and Economic Effects of Alternatives

Indicator	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Economic Output	$0	$210,206,000	$185,381,000	$189,564,000	$83,752,000
Labor Income	$0	$53,107,000	$46,523,000	$47,338,000	$21,932,000
Employment (Jobs)	0	1,236	1,067	1,074	549
Timber Sale Revenue	$0	$11,892,000	$9,851,000	$9,586,000	$6,334,000
Meets local social value for use of resources (potential revenue to county)	$0	$2,973,000	$2,463,000	$2,396,000	$1,583,000
Fuels Management Zones	0	4,800	4,800	4,800	6,000
Roadside Fuels Treatments	0	4,400	4,400	4,400	4,400
Wildland Urban Interface Treatments	0	2,200	2,200	2,200	2,200
Salvage Harvest Treatments	0	6,800	5,800	5,900	1,900
Roadside Hazard Treatments	0	9,000	9,000	8,000	9,000
Total Acres Treated to Improve Safety Conditions	0	27,200	26,200	25,300	23,500

All action alternatives will address priority treatment areas for safety. Consequently, effects to safety are only incrementally different among action alternatives, differing only by the acres of salvage harvest treatments proposed.

Compliance with law, regulation, policy and the Forest Plan

Actions are consistent with the Forest Plan (1995, as amended in 2010). Forest Plan management goals and standards and guidelines related to safety include to:

- provide an economical, safe, and environmentally sensitive transportation system for the Forest. Emphasize the maintenance and restoration of existing roads over the construction of new roads where appropriate (Forest Plan, page 4-8);
- provide administrative sites and facilities that effectively and safely serve the public and accommodate the workforce. Provide facilities with barrier-free access (Forest Plan, page 4-8); and
- provide an economical, safe, and environmentally sensitive transportation system for the Forest. Emphasize the maintenance and restoration of existing roads over the construction of new roads where appropriate. Provide administrative sites and facilities that effectively and safely serve the public and accommodate the workforce. Provide facilities with barrier-free access. (Forest Plan, page 4-37).

Forest Plan management direction related to other social and economic indicators is to:

- assist rural, forest-dependent communities with efforts to enhance their economic stability and social vitality (Forest Plan, page 4-65);
- work with local community leaders and individuals to provide opportunities for the development of natural resource-based enterprises (Forest Plan, page 4-65); and
- consider rural development options and opportunities in resource decisions that may assist rural communities in achieving long-term economic development stability and quality of life (Forest Plan, page 4-66).

All alternatives will be consistent with law, regulation, policy and the Forest Plan in relation to the social and economic environment as displayed in the Forest Plan consistency checklist.

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Appendix A

Klamath National Forest Westside Fire Recovery Project Economic Impact Analysis for the Draft Environmental Impact Statement (DEIS) March 2015

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Klamath National Forest Westside Fire Recovery Project Economic Impact Analysis for the Draft EIS March 2015

Executive Summary

The Klamath National Forest (Forest) proposes to implement the Westside Fire Recovery Project (project) to restore lands damaged by the Beaver and Whites Fires and the Happy Camp Fire Complex in 2014, among other goals and objectives. This report summarizes the analysis of regional economic impacts conducted to support the socioeconomic impact section of the Environmental Impact Statement being prepared for the project. The objectives of the economic impact analysis were to develop reliable and consistent estimates of the regional economic effects and the Siskiyou County fiscal impacts associated with the alternatives being analyzed in the EIS to help the public and decision-makers evaluate the alternatives.

The main tool used to analyze the project's economic impacts is a version of the standard IMPLAN input-output model for Siskiyou County customized in 2012 to provide a more accurate representation of the county's forestry sector. The economic effects analyzed using this model were employment, labor income, and economic output. Although the model used for this analysis is based on economic conditions in Siskiyou County, the region in which most of the project's economic effects are expected to occur is substantially larger than Siskiyou County. Specifically, the economic region used for this analysis included Siskiyou, Shasta, and Trinity Counties in California, and Jackson County in Oregon. In addition to economic effects, the fiscal effects on Siskiyou County resulting from its share of national forest timber sale revenues were estimated.

The analysis relied on Forest timber staff's estimates of timber harvest levels under four action alternatives, including the Proposed Action, which range from 71 to 178 million board feet. Each thousand board feet of timber processed by a Siskiyou County veneer mill produces veneer with an estimated producer value of $554. Veneer manufacturing, logging, log hauling, and forestry support services applied to landscape restoration were the industries considered to be directly affected by the project. The project's direct economic effects through these industries result in indirect and induced effects throughout the regional economy, which were estimated using the input-model discussed above.

Under the Alternative 2, the project would result in an estimated 855 direct jobs and 1,236 total jobs that would persist for approximately one year. These jobs would provide an estimated $37 million in direct income and $53 million in total income. Under the other action alternatives analyzed, the project's economic effects would be approximately 12 percent to 50 percent smaller, depending on the alternative. The project would return approximately $3 million in timber revenues to Siskiyou County under the Proposed Action, and between $1.6 million and $2.5 million under the other alternatives.

Introduction

The KNF proposes to implement the Westside Fire Recovery Project (project) to restore lands damaged by the Beaver and Whites Fires and the Happy Camp Fire Complex in 2014, among other goals and objectives. The proposed restoration includes salvage of fire-killed trees in selected areas within the boundaries of these fires. The KNF has developed four action

alternatives to be analyzed in the environmental impact statement (EIS) being prepared for the proposed project to meet the planning requirements of the National Environmental Policy Act. Among the aspects of the human environment to be analyzed in the EIS are socioeconomic impacts. This report summarizes the analysis of regional economic impacts conducted to support the socioeconomic impact section of the EIS. It focuses on the employment, labor income, and economic output (i.e., the value of all project-related sales) associated with two commercial aspects of the proposed action: timber harvesting and forest restoration activities such as site preparation, tree planting, and hazardous fuels reduction. The main tool used to analyze these effects was the Siskiyou County Forest Sector Model (SCFSM) (Dennis 2012), an input-output model developed by customizing the IMPLAN model for Siskiyou County. Also estimated was the project's fiscal impact on Siskiyou County through federal timber sale revenues returned to the county.

Objectives

The objectives of the economic impact analysis were to apply the Siskiyou County Forest Sector Model (Dennis 2012) to a specific project and provide reliable and consistent estimates of the regional economic effects and the Siskiyou County fiscal impacts associated with the project to help the public and decision-makers evaluate the alternatives presented in the DEIS.

Methodology

Input-Output Models

Input-output models are used to analyze regional economic impacts of projects, programs, or policies. They are called *input-output* models because the inputs (purchases) of one industry represent the outputs (sales) of other industries. An input-output model shows the annual monetary levels of economic transactions between the industries, governments, and household sector that compose the regional economy. Economists refer to changes in industrial production levels, employment, and income caused by a project as the project's *direct* effects. When an industry changes its production level, it generally adjusts its purchases of labor and commodities in response to the production change. Such changes in purchases by directly-affected industries are called the *indirect* effects of the project. As the directly- and indirectly-affected industries change their purchases of labor, the affected workers and their households adjust their personal consumption expenditures; such adjustments are called the *induced* effects of the project. The sum of the direct, indirect, and induced effects is called the *total* effect, and the ratio of the total effect to the direct effect is called the *multiplier*.

IMPLAN is one of the leading input-output modeling systems used for regional economic impact analysis. IMPLAN periodically updates databases that summarize inter-industry production and consumption for each state and county in the U.S. However, the data sources and methods used by IMPLAN to update its databases cause the reported transaction levels to be approximations of reality; in some cases, IMPLAN's approximations contain substantial departures relative to actual conditions in the state or county. The SCFSM was developed in 2012 by customizing the standard Siskiyou County IMPLAN model to provide a more reliable representation of Siskiyou County's forest sector than the standard IMPLAN model. It was developed primarily to support defensible analysis of the economic impacts of national forest projects in Siskiyou County.

Economic Region

Merchantable timber harvested from the Forest is sold at auction and shipped to one or more manufacturing facilities located in northern California or southern Oregon. Most of the mills that receive KNF timber are located in Siskiyou, Shasta, or Trinity counties in California, or Jackson County in Oregon, although some KNF timber is shipped to more distant manufacturing facilities. For this analysis, the economic region was defined to include Siskiyou, Shasta, Trinity, and Jackson counties, collectively referred to as the *four-county region*.

Using a model of the Siskiyou County economy to represent the four-county region involves some important assumptions. The main assumption implicit in using the SCFSM to analyze the effects of the Westside Forest Recovery Project within the four-county region is that the industrial structure of the four-county region's forest sector reasonably resembles that of Siskiyou County. For example, most, but not all, of the logging companies that harvest KNF timber and the trucking companies that haul the logs are located in one of the four counties; others are located outside the region. To the extent that the shares of within-region transactions versus interregional (i.e., import-export) transactions are similar for Siskiyou County and for the four-county region, using the SCFSM to analyze impacts in the four-county region will generally provide reliable results.

A key difference between the Siskiyou County forest sector and that of the four-county region is that Siskiyou County has limited sawmilling (i.e., lumber production) capacity compared to the other counties in the region. The main log-processing facilities in Siskiyou County are veneer mills. Siskiyou County's veneer mills typically purchase relatively low-value logs and may produce relatively high-value wood products compared to sawmills. As a result, the value added by primary log processing per thousand board feet (MBF) of log input in the four-county region may be overstated as a result of using the SCFSM.

Another key difference between the economies of Siskiyou County and the four-county region would tend to result in underestimation of economic impacts, and thus offset the problem described in the previous paragraph. In general, the larger an economic region, the more industries it contains, and the more likely that businesses and households are able to obtain goods and services from regional sources, as opposed to importing them from outside the region. This means that a large region generally has larger economic multipliers than does a subdivision of that region. So the multipliers used for this analysis, which are based exclusively on Siskiyou County trade patterns, are likely to be smaller than would apply to the four-county region.

The main objective of this analysis is to consistently describe the economic impacts of the EIS alternatives. Although using the SCFSM to analyze the four-county region could introduce bias from overestimating the value-added by log processing or underestimating economic multipliers, each of these biases would affect each alternative essentially the same, thus providing a consistent basis for comparing the alternatives.

Modeling the Economic Effects of Timber Harvesting

To assess the economic effects of timber harvesting and restoration activities for the project, information was obtained from Forest timber staff on the project's harvesting and contracting levels for each EIS alternative. Timber harvest levels expected for each alternative are shown by source area and logging system in Table 1.

Table 1: Expected Timber Harvest Volume in MBF by Alternative, Source Area, and Logging System

Logging System	Beaver Fire	Happy Camp Complex	Whites Fire	Total
Alternative 2				
Roadside hazard[1]	2,000	12,000	6,000	20,000
Ground-based	8,229	8,229	299	16,757
Skyline	3,112	64,722	5,091	72,925
Helicopter	0	61,819	6,718	68,537
Total	13,340	146,770	18,109	178,219
Alternative 3				
Roadside hazard[1]	3,000	12,500	6,500	22,000
Ground-based	0	7,747	299	8,046
Skyline	0	60,478	3,880	64,359
Helicopter	0	55,830	6,718	62,548
Total	3,000	136,555	17,398	156,952
Alternative 4				
Roadside hazard[1]	2,500	12,500	6,500	21,500
Ground-based	7,760	7,369	299	15,429
Skyline	2,187	46,000	4,974	53,161
Helicopter	0	63577	6718	70295
Total	12,447	129,446	18,491	160,384
Alternative 5				
Roadside hazard[1]	2,250	15,000	8,000	25,,250
Ground-based	8,229	2,969	195	11,392
Skyline	2,695	11,353	0	14,049
Helicopter	0	19,986	742	20,728
Total	13174	49,308	8,937	71,419

Source: KNF timber staff

[1]Harvesting roadside hazard trees using ground-based equipment has higher average cost than harvesting in forest stands, and is thus considered a separate logging system for logging cost purposes.

Each MBF of logs processed by a Siskiyou County veneer mill produces veneer with an estimated producer value of $554 (Dennis 2012). Processing the harvest volumes shown in Table 1 in these mills would produce veneer valued as shown in Table 2. The log volumes resulting from most project alternatives would exceed these mills' annual processing capacity; in all likelihood, a substantial project log volume would be processed out of Siskiyou County. However, as discussed above, assuming primary log processing occurs at the Siskiyou County facilities is a reasonable approach for estimating the project's economic effects.

Table 2: Estimated Economic Output From Primary Processing of Project Logs by Alternative

Alternative	Producer Veneer Value
2	$98,700,000

3	$87,000,000
4	$88,900,000
5	$39,500,000

Logging activities include felling trees, bucking them into logs, limbing, transporting logs to a landing, and loading logs onto trucks. Unit logging costs were estimated by Forest timber staff as follows:

Table 3: Estimated Unit Logging Cost by Logging System

Logging System	Logging Cost (Dollars per MBF)
Roadside hazard	$120
Ground-based	$80
Skyline	$140
Helicopter	$280

Source: Forest timber staff.

Extending the unit costs in Table 3 to the estimated harvest volumes by logging system in Table 1 provides the following estimates of total logging cost.

Table 4: Estimated Total Logging and Log Hauling Cost by Alternative

Alternative	Total Logging Cost	Total Hauling Cost
2	$33,140,000	$10,515,000
3	$29,807,000	$9,260,000
4	$30,940,000	$9,463,000
5	$11,712,000	$4,214,000

Unit log hauling costs were estimated by Forest timber staff for the following four source areas, assuming shipments went to various mills in northern California and southern Oregon based on historic shipping patterns:

- Beaver Fire: $58.50/MBF
- Whites Fire: $60.49/MBF
- Happy Camp Complex (Happy Camp District): $62.69/MBF, and
- Happy Camp Complex (Oak Knoll District): $54.77/MBF.

Because of the relatively small range in estimated unit hauling cost among source areas, all log shipments were assumed to cost $59 per MBF for this analysis. At this rate, total log hauling costs under each alternative would be as shown in Table 4.

Because of the availability of project-specific information on logging and log hauling costs, modifications were made to the SCFSM to ensure that the project's economic effects reflect the best available information on the value of logging and hauling activities required by the project. This was done by modeling logging and hauling activities as direct project outputs set at the levels shown in Table 4. To avoid double counting of logging and hauling services, a further modification to the SCFSM was made by setting the demand for regional logging and hauling services by the veneer manufacturing industry at zero. This approach more reliably estimates the

project's economic effects than using the standard demand for logging and hauling services by the veneer manufacturing industry contained in the SCFSM.

Modeling the Economic Effects of Restoration Service Contracts

Restoring the landscape of the project area will require investments in site preparation, tree planting, hazardous fuels reduction, and road maintenance, among other activities. All such restoration work is expected to be performed by private businesses under contract to the Forest. Forest staff estimated the costs of site preparation, planting, and fuels reduction by alternative as follows:

Table 5: Estimated Required Costs to Restore Project Landscape by Alternative

Alternative	Site Preparation and Planting	Fuels Reduction	Total Contract Cost
2	$14,771,000	$21,689,000	$36,460,000
3	$13,645,000	$15,664,000	$29,310,000
4	$13,835,000	$15,664,000	$29,500,000
5	$9,350,000	$16,452,000	$25,802,000

Source: Forest staff.

Restoration costs additional to those shown in Table 5, such as road maintenance costs, could be required to fully ameliorate damages from the 2014 fires.

Like most national forests, the Forest collects revenues from timber sales to pay for reforestation and other forest management activities. However, for catastrophic wildfires, such as the 2014 fires in the project area, national forests usually require additional funding based on Congressional appropriations to fund fire recovery activities. Unlike collections of timber sale revenues, such appropriations are uncertain and often insufficient to accomplish all needed restoration work. To avoid overestimating the restoration funding available for the project, and thus the economic impacts of these activities, this analysis assumed that only funds collected from timber sales would be available to fund restoration service contracts. Timber sale revenues were estimated by KNF timber staff based on values for fire-damaged timber determined by the California Board of Equalization for timber yield tax purposes, as shown in Table 6. To the extent that federal appropriations are forthcoming for restoring the project area, the economic effects of project restoration activities would exceed those estimated in this analysis.

Table 6: Distribution of Project Timber Harvest Volume and Unit Timber Value by Species

Species	Share of Total Volume	Base Unit Timber Value (Dollars per MBF)[1]
Douglas-fir	0.403	$240
Incense cedar	0.018	$100
Ponderosa pine	0.110	$100
Red fir	0.091	$140
Sugar pine	0.059	$100
White fir	0.318	$140
All-species weighted average base unit timber value		$173

Source: Forest timber staff and California Board of Equalization (2014)

[1]Base unit timber value is the per-MBF value of standing fire-damaged timber harvested using ground-based equipment in Timber Tax Value Area 4, which includes the West Side Fire Recovery Project area, as determined by the Board of Equalization for timber yield tax purposes.

Based on the harvest volumes in Table 1 and unit timber values in Table 6, adjusted for the logging cost differentials shown in Table 3, the project alternatives would generate timber revenue as shown in Table 7. These revenues would partially cover the restoration costs shown in Table 5, and were assumed to be applied to restoration service contracts. Restoration work was modeled as a direct project activity conducted by the IMPLAN industry called *support services for agriculture and forestry* at the levels shown in Table 7.

Table 7: Estimated Timber Sale Revenues and Share of Total Restoration Cost Fundable by Timber Revenues by Alternative

Alternative	Timber Sale Revenue	Share of Total Restoration Cost
2	$11,892,000	0.326
3	$9,851,000	0.336
4	$9,586,000	0.325
5	$6,334,000	0.245

Estimating the Fiscal Impact on Siskiyou County

Federal law requires that 25 percent of revenues generated by national forest timber sales be returned to the county of origin primarily to fund roads and schools in lieu of property taxes the county would collect, had national forest lands been in private ownership. The project's fiscal impact on Siskiyou County was estimated as 25 percent of the timber sale revenue shown in Table 7.

Results

Implementing the project would generate employment, labor income, and economic output in the four-county region through direct effects on the veneer manufacturing, logging, truck transport, and forestry support services industries. Additional employment, income, and output would be generated through indirect effects in the form of additional purchases made by the directly-affected industries, and through induced effects in the form of additional personal consumption expenditures by workers in the directly- and indirectly-affected industries and their households. Project effects on employment, income, and output estimated using the SCFSM are shown by alternative in Tables 8-11. These are one-time effects assumed to occur only in 2015, the year in which all planned project timber harvesting would occur. To the extent that project restoration activities are spread over subsequent years, their cumulative effects would be reflected in the results shown below for 2015, but their effects in individual years would be correspondingly smaller.

Table 8: Economic Effects Under Alternative 2 (Proposed Action)

Effect	Employment (Jobs)	Labor Income	Economic Output
Direct	855	$36,992,000	$154,247,000
Indirect	152	$8,913,000	$29,330,000

Induced	228	$7,202,000	$26,629,000
Total	1,236	$53,107,000	$210,206,000
Multiplier	1.44	1.43	1.36

Table 9: Economic Effects Under Alternative 3

Effect	Employment (Jobs)	Labor Income	Economic Output
Direct	732	$32,263,000	$135,918,000
Indirect	135	$7,951,000	$26,136,000
Induced	200	$6,309,000	$23,327,000
Total	1,067	$46,523,000	$185,381,000
Multiplier	1.46	1.44	1.36

Table 10: Economic Effects Under Alternative 4

Effect	Employment (Jobs)	Labor Income	Economic Output
Direct	731	$32,717,000	$138,889,000
Indirect	139	$8,202,000	$26,939,000
Induced	203	$6,410,000	$23,736,000
Total	1,074	$47,338,000	$189,564,000
Multiplier	1.47	1.45	1.36

Table 11: Economic Effects Under Alternative 5

Effect	Employment (Jobs)	Labor Income	Economic Output
Direct	397	$15,637,000	$61,760,000
Indirect	57	$3,320,000	$10,994,000
Induced	94	$2,975,000	$10,998,000
Total	549	$21,932,000	$83,752,000
Multiplier	1.38	1.40	1.36

As shown in Tables 8-11, the project's economic effects on the four-county region would be largest under alternative 2, roughly 12 percent smaller under alternatives 3 and 4, and roughly 50 percent smaller under alternative 5.

The relative contributions of timber harvesting and landscape restoration to the project's direct economic effects are given by their relative monetary values: depending on the alternative, 85 to 88 percent of the direct output effect is attributable to timber harvesting, and the remainder to restoration work. The two activities' relative contributions to indirect and induced economic effects are in roughly the same ratio. The relative economic importance of restoration work would increase in relation to the amount of federal funds appropriated for the project.

Table 12 shows the amount of project timber revenue expected to accrue to Siskiyou County. The project's fiscal impact would vary by alternative very similarly to its economic effects.

Table 12: Estimated Project Revenue Returned to Siskiyou County

Alternative	Revenue
2	$2,973,000
3	$2,463,000
4	$2,396,000
5	$1,583,000

References

California Board of Equalization. 2014. Modified harvest values schedule, effective October 1, 2014 through December 31, 2014. Sacramento, CA.

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