Crossons-Longview Forest Restoration Project Environmental Assessment

SocioEconomics Specialist Report V4

South Platte Ranger District
Pike National Forest
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1. INTRODUCTION

The purpose of the Crossons-Longview Forest Restoration Project is to restore sustainable forest conditions that are resilient to fire, insects, and diseases, while providing for diverse wildlife habitats, recreational opportunities, and sustainable watershed conditions. The specific purposes of this project are:

- To reduce the potential of large-scale, high-intensity wildfire with uncontrollable fire behavior, such as active crown fire.
- To reduce the potential that a wildfire would negatively affect public water supplies from subsequent severe flooding and sedimentation.
- To improve forest health, vigor, and resilience to large-scale fire, insects and disease.
- To enhance wildlife habitat through the reduction of the potential for high-intensity wildfires, enhancement of shrublands and aspen habitat, and Pawnee montane skipper habitat.

2. PROJECT DESCRIPTION

The South Platte Ranger District of the Pike and San Isabel National Forest proposes to treat 9,574 acres within the 22,729 acre Crossons-Longview Project Area to move the montane forest ecosystem towards historic conditions. The proposed actions would alter forest stand and understory conditions and would be accomplished by a combination of mechanical harvesting and hand treatment. Specific actions would be dependent on site-specific conditions and the vegetation type; however, actions would include thinning, created openings, and prescribed burning. Professional judgment would be used, within guidelines identified in the Environmental Assessment and taking into consideration the terrain and vegetative type, to determine which one or combination of treatments are most appropriate for individual treatment sites. Approximately 55 percent of the treatment areas are located within 0.5 miles of existing roads, with 33 percent of those areas treated by hand due to slopes between 35-60 percent. Approximately 61 percent of the treatment areas lie on slopes of 0-35 percent and would be considered appropriate for treatment with traditional harvesting equipment and commercial product removal. The treatments on slopes between 35-60 percent would likely be hand treatments. Where possible, vegetation treatments would take into consideration previously treated areas and/or past burned areas in order to increase the overall landscape benefit.

The Proposed Action does not include the establishment of any new system roads, however, approximately 10 miles of temporary roads would be used to access the proposed action treatment areas. The target vegetation areas are identified on Table 1 and Figure 1. It is expected that project activities would take approximately 10 years to treat the proposed treatment area.

Table 1. Crossons-Longview Alternative B -Proposed Treatment Areas

Vegetation Type	Area (acres)	Percentage
Xeric Ponderosa pine	4,581	49%
Mesic Ponderosa pine	3,684	38%
Mixed Conifer	603	6%
Lodgepole pine	557	6%
Aspen	121	1%
Shrubs	28	<1%
Total	9,574	

Alternative C was developed in response to a concern that increasing access through the use of temporary roads would cause some negative effects. Alternative C proposes that minimal temporary roads will be built to accomplish the project's purpose and need. Temporary roads would be limited to short segments needed to accomplish the treatments, such as jump-up spurs. Relying solely on the existing road network will lessen the ability for product removal and will shift treatment methods toward more mastication and hand thinning. This alternative seeks to balance forest restoration with concerns about expanding the existing road network.

Because minimal temporary roads will be constructed, all treatment must occur off of existing roads, limiting the area that can be treated. It is assumed that all treatment will occur within 0.5 miles of existing roads, reducing the available treatment area to 6,325 acres. Table 2 presents the proposed treatment area by vegetation type for Alternative C.

Table 2. Crossons-Longview Alternative C - Proposed Treatment Areas

Vegetation Type	Area (acres)	Percentage
Xeric Ponderosa pine	2,919	46%
Mesic Ponderosa pine	2,500	40%
Mixed Conifer	422	7%
Lodgepole pine	354	6%
Aspen	115	1%
Shrubs	16	<1%
Total	6,325	

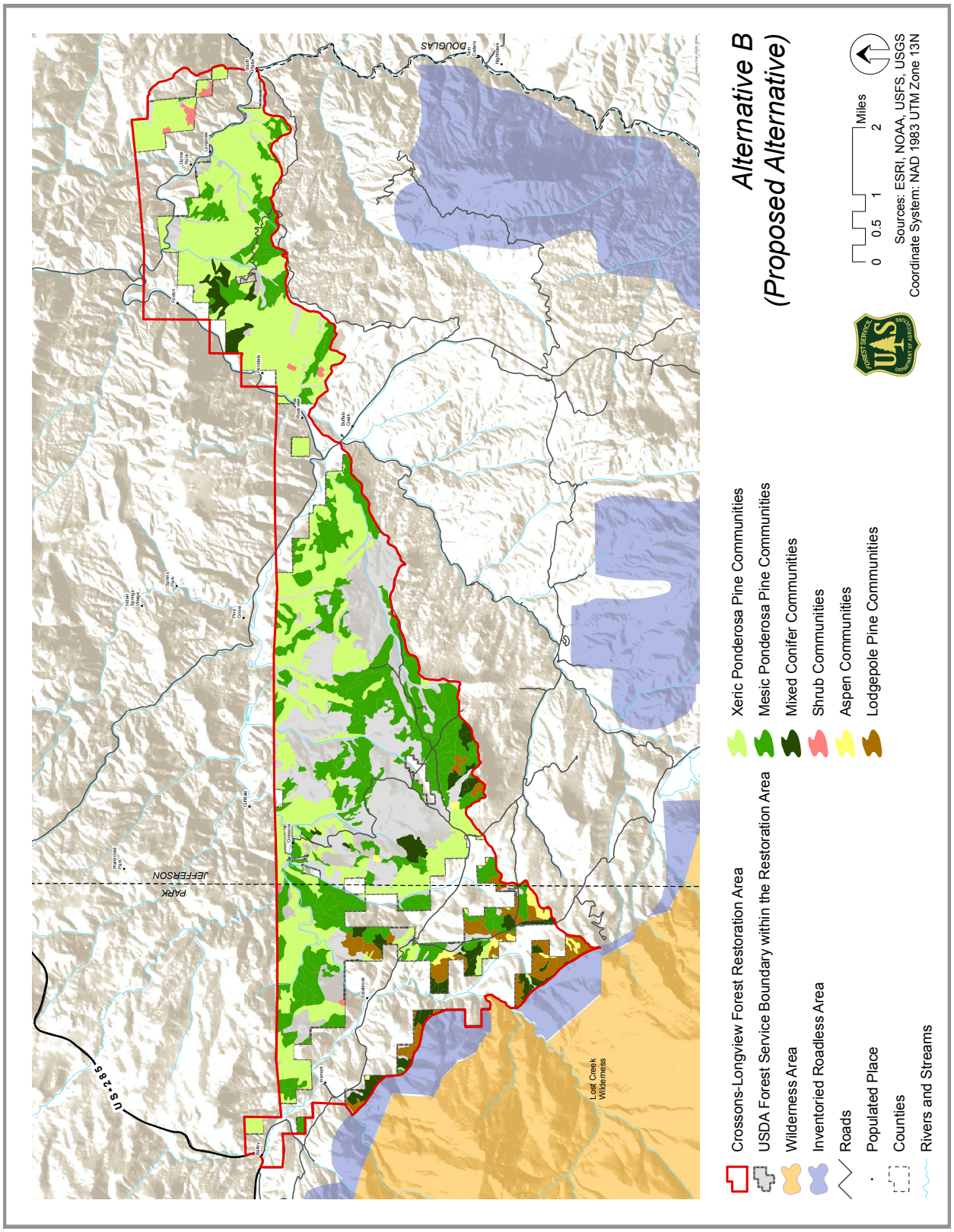

Figure 1. Crossons-Longview Treatment Area Map

3. Regulatory Framework

The socioeconomic analysis followed guidance from Forest Service Handbook 1909.17, and Forest Service Manuals 1922.4 and 1970. There are no other standards or guidelines from the Land and Resource Management Plan (LRMP) for the Pike and San Isabel National Forests; Comanche and Cimarron National Grass Lands (USDA 1984) that are relevant to the socioeconomic analysis.

4. Analysis Methods

The analysis includes quantitative and qualitative components. The qualitative components generally support the social analysis and the quantitative components support the economics analysis. The economic analysis methods and assumptions are described below.

4.1 Financial Efficiency Analysis

Financial efficiency is a comparison of those costs and benefits that can be quantified in terms of actual dollars spent or received on the project. The main criterion in assessing the financial efficiency of each alternative is Present Net Value (PNV), which is defined as the discounted value (at 4 percent) of agency revenue minus agency costs. When considering quantitative issues, financial efficiency analysis offers a consistent measure in dollars for comparison of alternatives. This type of analysis does not account for non-market benefits, opportunity costs, individual values, or other values, benefits, and costs that are not easily quantifiable. This is not to imply that such values are not significant or important - but recognizes that non-market values are difficult to represent with appropriate dollar figures. The values not included in this part of the analysis are often at the center of disagreements and the interest people have in forest resource projects. Therefore, financial efficiency should not be viewed as a complete answer but as one tool the decision maker uses to gain information about resources, alternatives, and trade-offs between costs and benefits.

PNV is an economic measure that accounts for all current and future costs and benefits within the treated units in a single dollar figure. Future costs and benefits are estimated and discounted into today's dollars and added to the current project costs and benefits. The result is a figure that can be compared across alternatives representing the total financial impact over the life of the project. Because a dollar is worth more now than it would be in the future, discounted costs and benefits are smaller figures. For example, a benefit of $1,000,000 in 100 years is worth about $20,000 today using the standard government discount rate of four percent.

This economic analysis compares direct monetary costs and benefits associated with the Crossons-Longview Forest Restoration Project for each proposed alternative. It provides the decision maker with comparative information on the relative economic effects of the alternatives. This analysis does not evaluate the economic

effects of indirect and/or unquantifiable costs and benefits that may be related to erosion control, prevention of widespread high intensity forest fire, potential economic loss of private property from high intensity fire, impacts to water supply systems and reservoirs downstream of the treatment areas, or any potential impacts both beneficial or adverse to wildlife species or recreational resources within the project area.

The EA evaluates three alternatives, Alternative A – No Action, Alternative B - Proposed Action, and Alternative C. This document describes the analysis conducted on the economic effects of implementing the forest restoration project for each alternative and estimates the NPV of vegetative treatments and associated costs and revenues generated from commercial harvesting of timber salvaged from the restoration project. An economic efficiency spreadsheet model was developed to complete the analysis, discounting current costs over the 10-year period using a US Forest Service standard discount rate of 4 percent (Appendix C). The NPVs to the Forest Service are calculated based on the direct costs and benefits per year for implementing and maintaining Alternative B - Proposed Action.

The quantifiable economic benefit for this project is the expected gross receipts to the Forest Service from the sale of commercial timber. In addition to the vegetative treatments of the proposed action, timber sale preparation and administration, road maintenance and temporary road construction, and completion of the environmental analysis (EA) are representative costs analyzed for the two action alternatives of the Crossons-Longview Reforestation Project EA.

4.2 Economic Assumptions Used in the Analysis

The following assumptions were used in this financial efficiency analysis:

1. Xeric ponderosa pine, mesic ponderosa pine and mixed conifer would yield similar timber volumes and income, estimated to be $100 per acre through timber sale contracts where traditional harvesting equipment and commercial product removal would occur. In xeric ponderosa pine, mesic ponderosa pine and mixed conifer on slopes greater than 35% and greater than 0.5 miles from roads, hand treatments would occur at a cost of $500 per acre.
2. Timber sale preparation costs average $40 per acre which is applied to xeric ponderosa pine, mesic ponderosa pine and mixed conifer.
3. Lodgepole pine, aspen and shrubland treatments would all be completed at a similar cost estimated to be $250 per acre. These treatments would likely be completed through a stewardship contract at cost.
4. Administration costs are $25 per acre and apply to all treated acres
5. Prescribed fire would be used in all treatments to reduce activity fuels. The cost for prescribed fire is $65 per acre.
6. Temporary roads would cost $500 per mile to construct and abandon.
7. Some existing roads would require maintenance, including resurfacing and drainage work. This maintenance would cost $250 per mile.
8. The analysis is in terms of 2014 dollars.

9. Both treatment costs and revenues from timber salvage are discounted over the 10 year project. Costs for road maintenance, temporary roads, and completion of the EA are anticipated to be expended in the first year.
10. It was assumed that total wood volume would be processed in each implementation year throughout the 10 year life of the project.
11. Above assumptions are based on past projects within the Upper South Platte and interviews with Arapaho-Roosevelt National Forest staff regarding costs of forest treatments completed by the Long-term Stewardship Contract.

Since both Alternatives B and C are similar except in scope of number of acres treated and the use of temporary roads, the socioeconomics impacts are anticipated to be similar over the 10 year life of the project. The addition of temporary roads in Alternative B would require some road building, but the overall employment and time frame effects of the road building and decommissioning through the 10 year period is considered to have a minimal effect on the overall socioeconomic impacts. The same crews would likely build the temporary roads. Population is not anticipated to grow significantly within the project area since much of the land is public land; however population will continue to grow in the broader study area to some degree.

5. Existing Conditions

This section describes the existing social and economic conditions of the Crossons-Longview Project Area and surrounding areas.

5.1 Project Area

The project area is located within unincorporated Jefferson and Park counties. Jefferson County is over 84 percent unincorporated and located within and west of the Denver metropolitan area. The incorporated portion of Jefferson County is represented by the western portion of the Denver metro area. Park County is located in the mountains, west of Jefferson County and is predominantly rural, unincorporated with few population centers. The project area is however in close proximity to the large Denver metropolitan area thus a popular attraction for recreational activities within easy driving distance.

Unincorporated Jefferson County contains approximately 260 square miles of parks, open space, and open lands. This is equivalent to about 40 percent of the total land area in unincorporated Jefferson County. These open areas include; Jefferson County Open Space Parks, Denver Mountain Parks, United States Forest Service land (Pike San Isabel Cimarron and Comanche National Forest-PSICC), Colorado State Parks, and parkland owned by a variety of Park and Recreation Districts.

Park County has a total of 2,194 square miles of land area, with a population density of only 7.33 per square mile. Unincorporated Park County also has a large number of parks, public lands, and open spaces. Most of the

developed parks and open spaces are not in the vicinity of the project area. However, the Lost Creek Wilderness Area is located adjacent to the project area where there are trails and wilderness activities including the Colorado Trail, Brookside McCurdy Trail, and Craig Creek Trail. Most of the open space in Park County near the study area is federally owned.

5.2 Local and Regional Economy

The unincorporated communities and residential subdivisions near the Crossons-Longview project area include the following residential areas or residential units within Jefferson County (within the project area or just outside the project area): Longview, Dome Rock, Foxton, Ferndale, Riverview, Crossons in the project area, and South Platte, Cliffdale, Sphinx Park, Pine Grove, Buffalo Creek, Indian Springs Village, just outside the project area. In Park County the following residential areas are located within the project area: Estabrook, Insmont and Bailey. In addition there are homes along US 285 and County roads (64) , west of Bailey. These residential communities which also include some commercial and industrial uses from the wildland/urban interface along the project area boundaries, and are most likely to be affected by the proposed project.

Changes in flexible work place, transportation, and communications have allowed people to continue working for city-based companies while living in rural or mountain communities. Most of the full-time residents of these communities commute to jobs outside of the immediate area. Other residents depend on tourism-based and forest resource-related activities for their economic livelihood. These activities include collecting wood products, hunting, outfitters and guides, and ranching, however these uses do not represent a large percentage of residents or a large part of the study area economic base. Still others telecommute or work out of their homes as small entrepreneurial businesses. Many residents surrounding the project area consider forest resources and forest health an important part of their quality of life.

5.3 Population

Population growth near the project area has been high for the last decade. The high growth rate has occurred despite the large proportion of public land in the area, primarily because residences in the area are located near U.S. Highway 285 and within a 30- to 40-mile commute to jobs in the Front Range of Colorado. It is anticipated that this area will continue to grow at a higher rate than the average in Colorado for the foreseeable future. It is likely that the communities around the project area will continue to draw new residents. The growth trend for the area may be slower in future decades than it was between 2000 and 2010 because of the limited availability of land to develop for residential uses.

Jefferson County encompasses the far western portion of the Denver metropolitan area including parts of Westminster, Arvada, Wheatridge, Lakewood, Littleton, Morrison, and Golden, but also extends into the Front

Range Mountains with smaller communities such as Conifer, Shaffers Crossing, Pine Junction, Evergreen, Aspen Park, many mountain parks and recreational areas and national forest lands. The population of Jefferson County is estimated at 551,798.

The population in Park County is estimated at 16,121. Only a small portion of Park County is within the project area, but includes the town of Bailey and the Pike National Forest. Park County extends across the mountains over Kenosha Pass into South Park with other small communities.

Census tracts 0809300200 Block Group 2 in Park County, 080590120.58 Block Groups 2, 3, and 4, and 080590120.36 Block Group 1 represent the population base within the project area and surrounding vicinity (Figure 2). Some surrounding census tracts within a two mile buffer radius include census tracts 08093000100 Block Group 3 and 0809300200 Block Group 1 in Park County, 08059012058 Block Group 1 in Jefferson County, and 08035014300 Block Group 1 in Douglas County.

From 2000 to 2010 the population of the entire census tract 080590120.58 only grew by 3 people. Within the two block groups represented in the project area, total population for both block groups (which extend far beyond the project boundary) is only 2,284. There are relatively few people living within the project area; however there are many rural residential developments within close proximity.

Population growth has many implications related to fire hazard and the need for fuel management. With more people comes greater hazard of human-caused wildland fire. Increased population also tends to increase property values and development, which increases potential losses from wildland fire.

5.4 Employment and Income

About 72 percent of Jefferson County resides in the foothills with the eastern portion located in the plains. Jefferson County has easy access to all major arterial highways and is close to downtown Denver. The County is considered a primary job creator in the State with over 62,250 firms. Employment in the county includes the aerospace industry, renewable energy, and research and development. The National Renewable Energy Laboratory, US Department of Energy's primary national laboratory for renewable energy and energy efficiency research and development is located in unincorporated Jefferson County. Many workers who live near the project area commute to jobs outside the area. For those workers who commute to work from near the project area, jobs are dominated by government, retail trade, health care and social services, accommodations and food, and professional and technical services. Other industries such as manufacturing and construction are also well represented in the county.

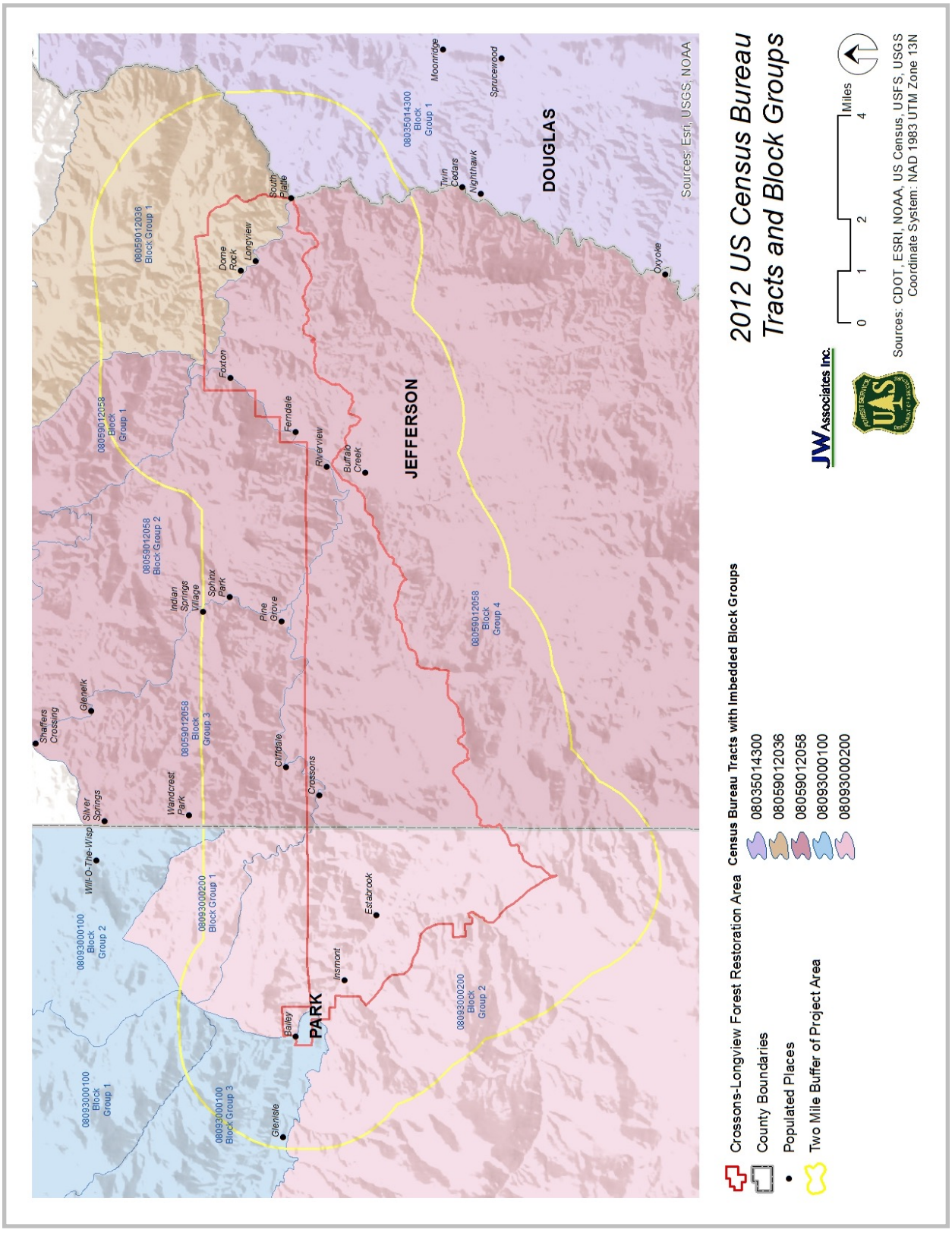

Figure 2. 2012 US Census Bureau Tract and Block Groups

According to the Colorado Department of Labor and Employment, 8,489 residents were employed in December 2013 in Park County. By comparison, 2,159 workers were employed within the county during 2012, which suggests that 75 percent of the adult workforce commutes to work outside the county due to relatively few employers in Park County and higher wages in neighboring counties. The largest employers in Park County include public administration (408 workers), education (399 workers), food and lodging (334 workers), construction trade (227 workers), retail trade (190 workers), and professional and technical services (122 workers). As in previous years, public administration and educational services employed the most workers within the county in 2012. Because the local economy is now largely driven by seasonal tourism and construction, employment data reflect fluctuations in these industries. In contrast, employment in manufacturing, communications, and health care remain fairly constant throughout the year.

The demand for second homes and new homes for an incoming population has stimulated the construction industry. The retail trade, and accommodation and food sector is also of relatively greater importance, as is typical of economies that depend on tourism and recreation. Wildland fires near the project area and in other parts of the state in 2002 and 2011 had a role in reduced tourist visits to Colorado, as media coverage of wildland fire incidents was extensive in the national press.

5.5 HOUSING

In 2012 the estimated number of housing units in the Census Tract Block groups represented in the project was 1,343 units. These census block groups extend well beyond the project area, however the number is representative of the number of units that may be affected by the proposed project activities if a high intensity fire would occur. The median housing value of an owner occupied home in census tract 120.58 was $333,100 in 2010 compared to $247,015 in all of Jefferson County in 2013. In Park County the median home value for an owner occupied unit in 2012 was $249,600. If a wildland fire were to occur in the vicinity some of these homes could be affected. A large-scale wildland fire has the potential to influence housing within two miles of the burned area (USDA 2002). Residential properties are most at risk for damage from wildland fire. Residential properties are most likely to be located next to forested areas, at greater distances from major access roads than other property types. Commercial and mixed use properties are generally located near U.S. Highway 285, and would have a smaller risk of damage from wildland fire because fire protection providers would have easier access to these properties since they are close to major thoroughfares. It is likely that many vacant properties would be developed with residential units to accommodate projected population growth in the near future and provide second homes in the area.

5.6 Community Services

The PSICC shares wildland fire suppression resources with other federal government agencies nationwide. Interagency wildland fire crews are dispatched where they are needed. Fire protection in the project area is provided by the PSICC, the Platte Canyon Fire Protection District (FPD), the North Fork FPD, and the Elk Creek FPD.

The Platte Canyon FPD serves the project area around Bailey in Park County with a wide range of emergency services. Demand for services increases by 45 percent due to tourists passing through the District (.http://www.plattecanyonfire.com/). Services include protection from fires; basic life support and medical assistance, chopper landings for emergency services, educational and training programs in fire and personal safety for firefighters and community (especially at public schools); CPR classes; wildland mitigation programs; swift water and ice rescue; mutual structural and wildland trainings between six surrounding fire departments. The district is a volunteer department with 65 volunteers, one paid fire fighter, and four stations. At all times there is adequate fire equipment spread between the four stations on the district to rapidly respond to all local fire calls and emergencies.

The Elk Creek FPD has 65 personnel in four fire stations in Richmond Hill, Pine Junction, Conifer Mountain Area, and Aspen Park. The district serves 98 square mile area in parts of western Jefferson County and eastern Park County and communities of Aspen Park-West, Bailey, Broken Arrow, Conifer, Cub Creek, Elk Falls, Evergreen Meadows, Evergreen South, Glen Elk, Hillview, Pine Valley, Pine Junction, Richmond Hill, Shaffers Crossing, Silver Springs and Wandcrest (http://www.elkcreekfire.org/ECFD/Welcome.html) . http://5280fire.com/?page_id=3011).The district population is an estimated 15,000 residents. Elk Creek Fire is a mostly volunteer combination Fire Department, staffed with 60 plus members, 8 career Fire Fighters / EMS providers, 3 Administration / Fleet, 12 plus Support Team and a full fleet of equipment for fire, wildfire and medical emergencies.

The North Fork Volunteer FPD provides structural and wildland fire suppression, emergency medical care and transport, rescue and fire prevention services to the mountain communities of Pine Grove, Buffalo Creek, Deckers, Trumbull, Oxyoke, Nighthawk and Scraggy View (http://www.northforkfire.org/). North Fork Volunteer Fire Department covers 306 square miles in southern Jefferson and northwest Douglas Counties in Colorado. Pike National Forest composes 80% of the District. While the number of residents in the District is approximately 1700, it is estimated that Pike National Forest has over one million people visit this division of the forest every year. North Fork utilizes three type I engines carrying 1000 gallons of water each, three tenders (or type III engines) carrying 2000 gallons of water each and one heavy rescue for structural

operations. North Fork Volunteer Fire Department provides structural fire suppression services to over 500 residences and businesses.

There is a broad range of hospitals, clinics, and other medical services within a 1- to 2-hour driving distance in Front Range urban communities.

6. EFFECTS

This section describes the effects of Alternative A (No Action), Alternative B (Proposed Action) and Alternative C on the socioeconomics of the Crossons-Longview Project Area.

Implementation of this alternative could affect the local economy as well as state and federal budgets due to both the risk of fire and the resulting outcome if a large-scale, high-intensity fire would occur. This alternative, the no-action alternative, would not implement any vegetation treatments and therefore has a higher risk of wildland fire than the other two alternatives. Should a large-scale fire occur in the project area, there would be a broad range of possible outcomes on the social and economic resources of Jefferson and Park County. The total cost of the fires within the project study area such as the Buffalo Creek, Lime Gulch, High Meadows, and North Fork Fires would include costs associated with suppression, rehabilitation, insured property losses, uninsured property losses, timber destruction, and other resource losses including losses to the water storage system.

6.1 ALTERNATIVE A (NO ACTION)

Alternative A (No Action) would have no direct effect on the socioeconomics of the Crossons-Longview Project Area. No vegetation treatments would be implemented under this alternative. The indirect effects are discussed below.

Implementation of this alternative could affect the local economy as well as state and federal budgets due to both the risk of fire and the resulting outcome if a large-scale, high-intensity fire would occur. This alternative, the no-action alternative, would not implement any vegetation treatments and therefore has a higher risk of wildland fire than the other two alternatives. Should a large-scale fire occur in the project area, there would be a broad range of possible outcomes on the social and economic resources of Jefferson and Park County. The total cost of the fires within the project study area such as the Buffalo Creek, Lime Gulch, High Meadows, and North Fork Fires would include costs associated with suppression, rehabilitation, insured property losses, uninsured property losses, timber destruction, and other resource losses including losses to the water storage system.

6.1.1 Population

Effects of wildland fire at the wildland-urban interface would likely cause a temporary decrease in the population of communities and subdivisions. If a fire occurred, the rate of residential development would decrease in the years following a wildland fire because the area may be considered less attractive due to the remnants of the burned trees and scorched land. This effect would continue until damages to local property owners and businesses are recovered, and the economy could once again provide the opportunities of the pre-fire economy.

6.1.2 Employment and Income

Likely impacts on employment and income from a high intensity fire would include decreases in tourism and visitation to natural areas within the project vicinity for the short term. A large-scale wildland fire that involves major fire damage to properties would have the greatest effects to the local economy, and would be felt through all businesses in the local economy for a long period. The direct effects to the local economy would continue until the scenic landscape has been re-established and property damages have been recovered. Indirect effects include the economic recovery of the area that would take place after the re-establishment and recovery of resources and properties.

6.1.3 Housing

Treatments in the project area directly and indirectly affect the safety and preservation of housing outside the project area. Low intensity fire within the project area may be easier to control and keep the fire from leaving the project area. Whereas high intensity fire may be more difficult to control within the project area and it may escape into buffer areas. Destruction of houses outside of the project area is also a function of hazardous fuels reduction immediately surrounding the houses. While any alternative, including a no-action alternative, within the project area, can have potential impacts on residences outside of the project area, the Forest Service does not have control over the actions of private landowners.

Hypothetically, assume a high intensity wildland fire destroyed an estimated 132 (10 percent) of the total 1,324 residences valued at $290,000 each, located in the major Census block groups within the project area. The value of those losses would be $38 million at full market value. If only a 60 percent loss occurred the estimated loss in value would be $23 million. In addition the loss of property taxes for the two counties would be substantial. In the future, the number of homes and the value of all properties are likely to increase. In the short-term, a large-scale wildfire could cause substantially higher losses than those discussed above. However, if private land owners are diligent at creating defensible space on their properties less property damage may occur.

6.1.4 Community Services

If a wildland fire occurred, it is likely that all of the existing fire protection resources in the project area would be involved in any large-scale wildland fire suppression effort. Interagency wildland fire crews would be dispatched from other areas as needed. Many local firefighters are volunteers, and would incur lost income because they would not be working at their regular jobs for the duration of a wildland fire unless they become paid cooperators after the mutual aid time period or when a fire is determined to be a federal fire. Many provisions for pay are also in place for fire department personnel working on fires outside NFS lands by the state or other pay type arrangements are made with employers. In some cases, fire pay can be greater than what a minimum wage individual is making,

Local emergency care and ambulance service is provided by the North Fork FPD, Elk Creek FPD, and Platte Canyon FPD. In the event that a wildland fire caused numerous injuries, the local emergency care and ambulance services may find it difficult to provide adequate emergency care. There are injuries and potential loss of life for firefighters as well as residents and visitors. Health problems could appear or be exacerbated by the inhalation of smoke. Local emergency care would need to be supplemented by additional personnel from nearby agencies.

6.2 ALTERNATIVES B (PROPOSED ACTION) AND C

6.2.1 Population

The project would not have noticeable direct or indirect effects on population. The skills and services required for the project would be provided by current US Forest Service personnel or by contractors or timber merchants. The long-term effect of vegetation treatment activities would be to decrease the potential for large-scale wildland fire and creating forest conditions that are resilient to fire, insects, and diseases.

This may contribute to the attractiveness of the region as a residential and recreational destination, supporting continued growth of the local economy and the permanent population.

One indirect effect of this alternative could be a perceived loss of privacy for homeowners adjacent to treated areas because the forest structure would be thinned and sight distances increased. However, this would only affect a small number of homeowners immediately adjacent to treated areas. This effect may be offset by the perception that future wildland fire hazard has been reduced, with evidence of this change available for viewing on adjacent forestlands. Because of the recent Buffalo Creek, Lime Gulch, Hi Meadows, and North Fork fires and associated property losses, it is likely that many residents would prefer the reduced fire hazard, even at the cost of reduced privacy. For example, surveys of residents in a nearby communities showed a strong preference for using various types of fire and fuels management tools, as opposed to taking no action at all (Kent et al. 2003).

6.2.2 Employment and Income

The primary goal for treatment is fuel reduction, which leaves most of the larger trees. However, the vegetation treatments would produce a variety of wood products ranging from saw timber, to post and poles, firewood, and chips for biomass projects. Timber harvest and other service contracting opportunities would be available to local wood products companies and some employment would be supported by thinning, harvesting, and other activities. If contractors from outside the community are selected for the project, a minor economic benefit may be realized by local stores, restaurants, and other businesses; however, this effect is expected to be relatively small compared to the effect of ongoing residential and recreational activities in and near the project area.

Employment and income from tourism activity is important in the local area. Much of this activity is based on recreational opportunities on NFS lands, including the project area. Treatment activities would temporarily displace some dispersed uses such as various motorized and non-motorized activities, wildlife viewing, hunting, and backcountry recreation, including guided activities by outfitter guides under Special Use permits. The restriction or displacement of recreational activities and any subsequent economic effects would be temporary. There are several substitute sites for any displaced activity. In addition, only a small percentage of the project area would undergo treatment at any one time. It is not likely that the overall number of persons engaging in these activities would change because of treatment; therefore, there would be no measurable economic effect from the displacement of recreational activities.

6.2.3 Housing

It is anticipated that the workforce to implement the proposed treatments would comprise a combination of current US Forest Service personnel and contractors. Contractors could be local or could come from outside the area. In the event that additional workforce from outside of the region is required for project activities, there would be a relatively small demand for temporary housing that could be accommodated by existing resources. Nearby communities provide a range of temporary and seasonal housing. In addition, outside contractors may use travel trailers during the time they are working on the project.

The intent of the project is to restore sustainable forest conditions that are resilient to fire, insects and diseases with an outcome of also reducing the hazard to private property from wildland fires. Many existing homes have been built near NFS lands in the project area. In addition, timber stands are interspersed among many homes on private lands adjacent to NFS lands. Within the two major census tract blocks located within the project boundary there are a total of 1,343 residential units, however it is not likely that all of these units are within the project boundary. The total number of residential units in the census tract blocks within the project area and two mile buffer zone is 8,032. Clearly all of these units are not located within the project area. Only a

small number of residences are actually located within the project boundary perhaps less than 100. Nevertheless the proposed treatments could reduce the risk to private property. Based on the reduction in both predicted fire size and intensity, a large-scale fire in the project area and adjacent buffer could destroy hundreds of residences. The destruction of these houses could cause millions of dollars of losses. In addition to the loss of the property value, residential property tax revenues would be reduced.

Another housing-related concern is the potential inability of homeowners to secure insurance. There has been increasing discussion in recent years that insurance companies may deny policies to homeowners in fire-prone areas. As yet, there does not appear to be clear indication that this is happening. By reducing potential fire behavior and fire danger on adjacent forest lands, these alternatives may reduce the chance that residents would lose their homeowners insurance http://www.insurancejournal.com/news/national/2013/08/15/301833.htm.

6.2.4 Community Services

Existing fire protection resources may need to be improved in response to ongoing residential and commercial development on private lands near the project area. The proposed project would not affect this growth. Successful implementation of the proposed project may reduce the potential for extreme fire behavior and large-scale wildland fire. This may reduce the hazard of fighting a fire for local firefighting resources at the same time that the demand for protection of homes and other resources is increasing.

The proposed project may also help in protecting facility infrastructure such as power lines, substations, and other structural facilities within the project area and surrounding zone.

6.2.5 Watershed Protection

In the West, watershed protection and rehabilitation have become increasingly urgent. Experts predict that climate change and drought will exacerbate water shortages and cause larger, more intense wildfires that increase flooding and sedimentation that can have major impacts on watersheds and water supplies (High Country News 2012). Thinning can help protect a watershed from intense wildfires and protect water that flows into creeks and reservoirs (High Country News 2012)

The Front Range of Colorado experienced major impacts to municipal water supplies as a result of flooding, erosion and sediment deposition after the 1996 Buffalo Creek Fire, 2000 Bobcat Fire, and 2002 Hayman and Schoonover fires, and 2012 High Park and Waldo Canyon Fires. The Denver Water Department and City of Aurora will spend up to $40 million to mitigate the impacts of those fires on their water supply system, while the City of Fort Collins and Colorado Springs Utilities have yet to estimate the total costs of the 2012 fires.

Denver Water, the utility that supplies 1.3 million people in the metro area, spent more than $26 million dredging Strontia Springs Reservoir, treating the water and rehabilitating the watershed after the Buffalo Creek, Hayman, and Hi Meadow Fires.

This forest restoration project could benefit watersheds and help to avoid costs related to watershed rehabilitation triggered by wildland fires.

In addition to these benefits, benefits would be derived from restoring sustainable forest conditions that are resilient to insects and diseases while providing for diverse wildlife habitats, recreational opportunities and sustainable watershed conditions.

6.2.6 Economic Analysis

The economic analysis used the assumptions listed above in Economic Assumptions Used in the Analysis, as well as acreage treated and harvested. These values were entered into the economic model to calculate the economic indicators of effects from the proposed action. These results were discounted over the 10 year project period.

Additional modeling assumptions;

- Alternative A is the no action alternative, so there are no direct costs or benefits.
- Alternative B treats an estimated 5,409 acres of ponderosa pine and mixed conifer. Hand vegetative treatments totaled 3,459 acres of ponderosa pine and mixed conifer, vegetative treatment of lodgepole pine, aspen and shrublands totaled 706 acres. Five miles of roads would be maintained and 3 miles of temporary roads constructed (JW Associates, 2014).
- Alternative C treats an estimated 3,913 acres of ponderosa pine and mixed conifer. Hand vegetative treatments totaled 1,928 acres of ponderosa pine and mixed conifer, vegetative treatment of lodgepole pine, aspen and shrublands totaled 485 acres. Five miles of roads would be maintained. Minimal temporary roads would be constructed.

The analysis of Present Net Value by Alternative (Table 3), shows the financial efficiency analysis for quantifiable costs and benefits that change by alternative. This analysis is in compliance with FSM 1970.3, 1970.6 and the Region 2 Supplement. The analysis considered many costs and revenues, with timber revenues based on regional timber sale appraisal bulletin for ponderosa pine and mixed conifer. Forest Service implementation costs included vegetation treatment, sale preparation, sale administration, service contract, prescribed burn, handpiling, noxious weed surveys, temporary roads, road maintenance costs. Some treated acreage would not generate revenues. Alternative A (No Action) represents the baseline from which to compare the action alternatives and is valued at zero.

Table 3. Present Net Value for Alternatives (thousands of $).

Alternative	Discounted Total Costs	Discounted Total Benefits	Discounted Present Net Value	Benefit /Cost Ratio
A	$0	$0	$0	0
B	$2,594	$439	-$2,156	0.17
C	$1,641	$318	-$1,324	0.19

Both action alternatives show a net loss through the analysis period (Table 4), which suggests, from a timber sale standpoint, the project is not economically feasible. Since the Crossons-Longview project is primarily forest restoration not a timber sale per se, the costs involved in calculating net present value include significant costs for fuels reduction, vegetation treatment, and forest restoration. These additional costs include prescribed burns, thinning, handpiling and other treatment of materials on site. Alternative C shows the lowest net loss of the two action alternatives analyzed since it does not include the cost of temporary road construction. The figures in Alternatives B and C reflect the discounted costs over the 10 year period and the discounted revenues generated from the improvement cuts or commercial harvesting. Detailed tables from the analysis are in Appendix A.

The loss reflected in this analysis is largely due to (1) meeting the objectives of a restoration project, which improves forest conditions and has extensive unquantifiable benefits, (2) the cost of restoration treatments that would not normally occur in a commercial sale, (3) some lower-value and volume product being removed, and (4) limited market conditions.

The unquantifiable benefits of the project for both alternatives include the following:

Vegetative Treatment

1. Reduced risk of intense fire either small or large-scale, high-intensity fire and subsequent erosion
2. Reduced potential wildfire suppression and restoration costs
3. Reduced fire-related risk to human life and property
4. Increased water quality protection
5. Forest restoration and increased sustainability
6. Improved threatened Pawnee montane skipper habitat
7. Increased protection of recreation resources

Road Reclamation and Improvement

1. Reduced erosion and stream sediment loading
2. Increased long-term aquatic habitat productivity

Table 4. Benefits, Costs and Revenues by Alternative.

	Alternative A	Alternative B	Alternative C
BENEFITS			
Vegetative Treatment			
Reduced risk of large high intensity fire and subsequent erosion	no	yes	yes
Reduced potential wildfire suppression and restoration costs	no	yes	yes
Reduced fire-related risk to human life and property	no	yes	yes
Increased water quality protection	no	yes	yes
Forest restoration and increased sustainability	no	yes	yes
Improved threatened prairie montane skipper habitat	no	yes	yes
Increased protection of recreation resources	no	yes	yes
Road Reclamation			
Reduced erosion and stream sediment loading	no	yes	yes
Increased long-term aquatic habitat productivity	no	yes	yes
COSTS			
Ponderosa Pine Mixed Conifer Veg. Treatment	$ -00	$ 2,224,926	$ 1,334,311
Lodgepole, Aspen, Shrublands Veg. Treatment	$ -00	$ 193,756	$ 132,581
Road Costs	$ -00	$ 2,644	$ 1,202
Total Cost for EA	$ -00	$ 173,077	$ 173,077
Total costs	$ -00	$ 2,594,402	$ 1,641,171
REVENUES			
Income from Commercial Harvesting	$ -00	$438,680	$317,480
Total revenues	$ -00	$438,680	$317,480
Present Net Value (Costs - Revenues)	$ -00	($2,155,722)	($1,323,691)

6.3 Environmental Justice

Under Executive Order 12898 (Federal Register 1994), federal agencies are required to identify and address disproportionately high or adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations. A specific consideration of equity and fairness in resource decision-making is encompassed in the issue of environmental justice. As required by law and Title VI, all federal actions will consider potentially disproportionate negative impacts on minority or low-income communities. Minimal minority or low income populations would be affected within the Proposed Project area.

As shown in the table below, the population that lives within the project area is predominantly white, with a low percentage of poverty, and higher per capita and median incomes than the average for the State of Colorado. Income levels throughout the project area are diverse. The most recent estimate of median household income was in 2013, and shows an estimate of $58,433 for Colorado compared to $68,984 for Jefferson County, and $61,570 for Park County (U.S. Census Bureau 2014). Both Park and Jefferson counties

have higher median household incomes since these two counties represent rural mountain suburbs for the city of Denver. The population have somewhat higher incomes due to a higher percentage of professional occupations, wealthier homeowners who may live in more desirable properties in these mountain locations and choose to commute, and second home owners who typically have higher income. This higher income is reflective of the components of rural living near a large metropolitan area with some individuals working in management, sales or professional employment or who are possibly considered lone-eagles or self-employed.

The most recent poverty status statistics are from the 2013 Census Bureau data. These data showed poverty status for 13.2 percent of the total Colorado population compared to 8.6 percent in Jefferson County, and 9.1 percent in Park County. Again these statistics show a middle to upper middle class population base within the region, with a below poverty population well below the state average. People within the poverty status may reside within the project area, but not in disproportionate numbers.

Table 5 shows some basic demographic statistics for identifying potential areas of concern.

Table 5. 2013 Census Community Statistics for Environmental Justice Analysis[1]

Population	Colorado	Jefferson	Park
Total Population	5,268,367	551,798	16,121
Percent Below Poverty[1]	13.2	18.6	9.1
Percent White	88.0	92.4	95.2
Percent Black	4.4	1.3	0.5
Percent American Indian	1.6	1.2	1.2
Percent Asian	3.0	2.8	0.7
Percent Native Hawaiian or Pacific Islander	0.2	0.1	-
2 or more Races	2.8	2.3	2.2
White Alone	69.4	79.1	90.5
Percent Hispanic Origin	21.0	15.0	5.7
Per Capita Income	$31,109	$36,087	$31,504
Median Household Income	$58,433	$68,984	$61,570

[1] 2009 to 2013

6.4 Consistency with Forest Plan

Alternative B (Proposed Action) would be consistent with all Forest Plan Goals, and General direction, standards and guidelines. Alternative A (No Action) would be consistent with all Forest Plan Goals, and General direction, standards and guidelines, except for the Goals pertaining to increasing water yield.

7. References

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8. List of Preparers

Name/Title	Role	
US Forest Service – Pike and San Isabel National Forests, Cimarron Comanche National Grassland		
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Name/Title	**Education/Experience**	**Role**
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Jennifer Kathol	B.S. Natural Resource Economics, Colorado State University 30 Years Experience	Report Author

APPENDIX A.
DETAILED FINANCIAL EFFICIENCY ANALYSIS

Table A-1. Cost and Revenue Detail

	Cost per unit	Alt. A	Alt. B	Alt. C
Treatment Area (acres)		0	9,574	6,326
Ponderosa pine + Mixed Conifer				
Ponderosa pine + Mixed Conifer (acres)		0	8,868	5,841
Commercial Harvesting (acres)		0	5,409	3,913
Income from Commercial Harvesting	$100	$0	$540,948	$391,347
Hand Treatment (acres)		0	3,459	1,928
Cost of Hand Treatments	$500	$0	$1,729,260	$963,765
Timber Sale Preparation	$40	$0	$216,379	$156,539
Administrative Costs	$25	$0	$221,700	$146,025
Prescribed Fire Cost	$65	$0	$576,420	$379,665
Total Ponderosa & Mixed Conifer Costs		$0	$2,743,759	$1,645,994
Lodgepole Pine, Aspen and Shrublands				
Lodgepole Pine, Aspen and Shrublands (acres)		0	706	485
Vegetation Treatment Cost	$250	$0	$176,500	$121,250
Administrative Costs	$25	$0	$17,650	$12,125
Prescribed Fire Cost	$65	$0	$45,890	$31,525
Total Lodgepole, Aspen & Shrubland Costs		$0	$240,040	$164,900
Road Costs				
Road Maintenance (5 miles)	$250	$0	$1,250	$1,250
Temporary Roads (3 miles)	$500	$0	$1,500	$0
Total Road Costs		$0	$2,750	$1,250
Other Costs				
NEPA Costs			$180,000	$180,000
Total Revenues		$0	$540,948	$391,347
Total Costs		$0	$3,166,549	$1,992,144

Table A-2. Discounted Costs and Revenues by Implementation Year

Alternative	B	C	4% Discount Rate	B	C
Year 1					
Ponderosa Pine Mixed Conifer Veg. Treatment	$274,376	$164,686	1.040	$263,823	$158,352
Lodgepole, Aspen, Shrublands Veg. Treatment	$24,004	$16,490	1.040	$23,081	$15,856
Road Costs	$2,750	$1,250	1.040	$2,644	$1,202
Total Cost for EA	$180,000	$180,000	1.040	$173,077	$173,077
Total Cost	$481,130	$362,426		$462,625	$348,487
Total Revenue	$54,095	$39,202	1.040	$52,014	$37,694
Year 2					
Ponderosa Pine Mixed Conifer Veg. Treatment	$274,376	$164,599	1.082	$253,676	$152,181
Lodgepole, Aspen, Shrublands Veg. Treatment	$24,004	$16,490	1.082	$22,193	$15,246
Road Costs	$0	$0	1.082	$0	$0
Total Cost for EA	$0	$0	1.082	$0	$0
Total	$298,380	$181,089		$275,869	$167,427
Total Revenue	$54,095	$39,135	1.082	$50,014	$36,182
Year 3					
Ponderosa Pine Mixed Conifer Veg. Treatment	$274,376	$164,599	1.125	$243,911	$146,324
Lodgepole, Aspen, Shrublands Veg. Treatment	$24,004	$16,490	1.125	$21,339	$14,659
Road Costs	$0	$0	1.125	$0	$0
Total Cost for EA	$0	$0	1.125	$0	$0
Total	$298,380	$181,089		$265,250	$160,983
Total Revenue	$54,095	$39,135	1.125	$48,089	$34,789
Year 4					
Ponderosa Pine Mixed Conifer Veg. Treatment	$274,376	$164,599	1.170	$234,529	$140,695
Lodgepole, Aspen, Shrublands Veg. Treatment	$24,004	$16,490	1.170	$20,518	$14,095
Road Costs	$0	$0	1.170	$0	$0
Total Cost for EA	$0	$0	1.170	$0	$0
Total	$298,380	$181,089		$255,047	$154,790
Total Revenue	$54,095	$39,135	1.170	$46,239	$33,451
Year 5					
Ponderosa Pine Mixed Conifer Veg. Treatment	$274,376	$164,599	1.217	$225,508	$135,283
Lodgepole, Aspen, Shrublands Veg. Treatment	$24,004	$16,490	1.217	$19,729	$13,553
Road Costs	$0	$0	1.217	$0	$0
Total Cost for EA	$0	$0	1.217	$0	$0
Total	$298,380	$181,089		$245,237	$148,837
Total Revenue	$54,095	$39,135	1.217	$44,460	$32,165
Year 6					
Ponderosa Pine Mixed Conifer Veg. Treatment	$274,376	$164,599	1.265	$216,847	$130,087
Lodgepole, Aspen, Shrublands Veg. Treatment	$24,004	$16,490	1.265	$18,971	$13,032
Road Costs	$0	$0	1.265	$0	$0
Total Cost for EA	$0	$0	1.265	$0	$0
Total	$298,380	$181,089		$235,818	$143,120

Alternative	B	C	4% Discount Rate	B	C
Total Revenue	$54,095	$39,135	1.265	$42,753	$30,929
Year 7					
Ponderosa Pine Mixed Conifer Veg. Treatment	$274,376	$164,599	1.316	$208,508	$125,085
Lodgepole, Aspen, Shrublands Veg. Treatment	$24,004	$16,490	1.316	$18,242	$12,531
Road Costs	$0	$0	1.316	$0	$0
Total Cost for EA	$0	$0	1.316	$0	$0
Total	$298,380	$181,089		$226,750	$137,616
Total Revenue	$54,095	$39,135	1.316	$41,109	$29,740
Year 8					
Ponderosa Pine Mixed Conifer Veg. Treatment	$274,376	$164,599	1.369	$200,479	$120,268
Lodgepole, Aspen, Shrublands Veg. Treatment	$24,004	$16,490	1.369	$17,539	$12,049
Road Costs	$0	$0	1.369	$0	$0
Total Cost for EA	$0	$0	1.369	$0	$0
Total	$298,380	$181,089		$218,018	$132,317
Total Revenue	$54,095	$39,135	1.369	$39,526	$28,595
Year 9					
Ponderosa Pine Mixed Conifer Veg. Treatment	$274,376	$164,009	1.423	$192,774	$115,232
Lodgepole, Aspen, Shrublands Veg. Treatment	$23,324	$15,810	1.423	$16,387	$11,108
Road Costs	$0	$0	1.423	$0	$0
Total Cost for EA	$0	$0	1.423	$0	$0
Total	$297,700	$179,819		$209,162	$126,340
Total Revenue	$54,095	$39,135	1.423	$38,007	$27,496
Year 10					
Ponderosa Pine Mixed Conifer Veg. Treatment	$273,643	$164,009	1.480	$184,869	$110,802
Lodgepole, Aspen, Shrublands Veg. Treatment	$23,324	$15,470	1.480	$15,757	$10,451
Road Costs	$0	$0	1.480	$0	$0
Total Cost for EA	$0	$0	1.480	$0	$0
Total	$296,967	$179,479		$200,626	$121,253
Total Revenue	$53,985	$39,135	1.480	$36,471	$26,439
All Years					
Ponderosa Pine Mixed Conifer Veg. Treatment	$2,743,026	$1,644,901		$2,224,926	$1,334,311
Lodgepole, Aspen, Shrublands Veg. Treatment	$238,680	$163,200		$193,756	$132,581
Road Costs	$2,750	$1,250		$2,644	$1,202
Total Cost for EA	$180,000	$180,000		$173,077	$173,077
Total	$3,164,456	$1,989,351		$2,594,402	$1,641,171
Total Revenue	$540,838	$391,414		$438,680	$317,480