

U.S. Sheep Experiment Station Grazing and Associated Activities Project 2016

Final Economics Report

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Table of Contents

Summary	1
Introduction	1
Analysis Area	1
Irreversible and Irretrievable Commitment of Resources	2
Economic Environment: Existing Conditions	2
Demographics	3
Employment	5
Income.....	7
Commuting.....	8
Environmental Justice	9
Environmental Consequences	10
Methodology	10
Modified Alternative 1 - Proposed Action/ No Action.....	12
Direct and Indirect Effects.....	13
Cumulative Effects	16
Effects Common to All Alternatives.....	16
Cumulative Effects	16
Effects Common to all Action Alternatives	17
Environmental Justice	17
References	18

List of Tables

Table 1. Population change in analysis area counties	3
Table 2. Race and ethnic distribution of analysis area counties.....	5
Table 3. Employment in Clark County and the 5-County analysis areas by Sector.....	6
Table 4. Labor Income in Clark County and the 5-County analysis areas by Sector.....	7
Table 5. Total Personal Income by Source.....	8
Table 6. Method of Commuting to Work, Proportion of Clark County’s Labor Force.....	9
Table 7. County of Workplace, Proportion of Clark County’s Labor Force.....	9
Table 8. Poverty Levels by County, All Ages.....	10
Table 9. Poverty Levels by County, Under Age 18.....	10
Table 10. Annual Income of USSES Employees Residing in Clark County	14
Table 11. Total Salary related contributions from a range of Station expenditures in Clark County	14
Table 12. Implications for local taxes	15

List of Figures

Figure 1. Age Distribution by County and State	4
Figure 2. County, State and National Unemployment Rates, 2009.....	6

Summary

The USSES is 13th largest employer in Clark County and thus provides important economic contributions to local businesses and public services. Under the alternatives there would be no net change in area social or economic conditions since Sheep Station expenditures are not anticipated to change. Under the action alternatives small reductions in forage utilization and research capacity could affect the value of research to the sheep industry. Regardless, continuation of management under the Modified Proposed Action alternative would maintain the value of research conducted at the station while also providing an important source of local economic contributions, in terms of employment and income. Under all the alternatives disproportionate and adverse effects to minority or low income populations would not occur.

Introduction

The United States Sheep Experiment Station (USSES), a subsidiary of the U.S. Agricultural Research Service (ARS), has been grazing sheep on Federal lands in Idaho and Montana since the early 20th century. Dedicated to the research of range management of sheep, the mission of the station is to “develop integrated methods for increasing production efficiency of sheep and to simultaneously improve the sustainability of rangeland ecosystems” (http://www.ars.usda.gov/Main/site_main.htm?modecode=53-64-00-00). Located approximately six miles north of Dubois, ID, the USSES is the second largest employer in Clark County. There are currently 13 full time employees as well as interns, student employees, and intermittent general duty employees (http://www.ars.usda.gov/Main/site_main.htm?modecode=53-64-00-00).

On February 13, 2008, the United States District Court for the District of Idaho ordered the U.S. Department of Agriculture’s Agricultural Research Service and Forest Service to prepare environmental documents to comply with National Environmental Policy Act (NEPA) standards (Case No. 07-CV-0279-E-MHW). As such, the USSES is conducting this Environmental Impact Statement (EIS) to assess the potential environmental effects of the sheep grazing it oversees. In addition to the biological component of this EIS, it has been determined that the actions considered in the alternatives developed may potentially have implications for the economic environment of Clark County. The objective of this specialist report is to identify those effects. Five alternatives are being considered in detail and are described in Chapter 2 of the EIS. Under NEPA, a no action alternative must be considered in all EISs; in this case the modified proposed action/no action alternative is the status quo, or maintaining historical grazing activities. Under this alternative, there would be no change in activity associated with research conducted by the USSES, and thus no change to the current economic conditions of Clark County and the surrounding analysis area. The remaining alternatives, however, would result in a reduction of grazing utilization, which would alter operations at the station and its relationship with the local economy.

The objective of this report is to identify the potential economic effects to Clark County and other counties in the area connected to operations at the station. A description of the study area is provided, followed by an assessment of the existing conditions of the local economy as well as implications for environmental justice populations. The remainder of the report will focus on the economic impacts of each alternative. Economic impacts are measured in terms of changes in jobs and income.

Analysis Area

Based on comments received during scoping and review of the initial Environmental Assessment, two analysis areas are considered. The importance of Sheep Station salary related impacts are considered within Clark County, ID while non-salary related station expenditures are considered for a larger analysis

area that includes Beaverhead County in Montana and Clark, Bonneville, Jefferson, and Madison counties in Idaho. Housing, commuting, and expenditure patterns of USSES employees suggest that the primary economic area of concern is for salary related impacts in Clark County. However, almost all non-salary related Sheep Station expenditures occur within the surrounding area outside of Clark County. Thus, two analysis areas allow for measurement of the importance of Sheep Station employee expenditures within Clark County while also considering effects within the larger five county area where non-salary expenditures are made.

Using two analysis areas avoids potential dilution of important relationships with Clark County while also comprehensively examining the role of the Sheep Station's contributions on the surrounding area economy. For example, a potential loss of jobs in Clark County would constitute a larger proportion of all employment for a larger area that includes Idaho Falls. The more economically diverse community of Idaho Falls would be better positioned to withstand such a loss because other sectors may be able to absorb the increased labor on the market. Since the recent closure of agricultural processing plants in Clark County, the Sheep Station is the largest employer in the County. The description of the existing condition below focuses on Clark County with additional information also included for the expanded analysis area.

Irreversible and Irretrievable Commitment of Resources

The alternatives analyzed in this report could result in changes to Sheep Station operations; however, no net change in salary or non-salary expenditures are anticipated. In addition, there would be no irreversible or irretrievable commitment of these resources since the Sheep Station budget is not anticipated to change amongst the alternatives.

Economic Environment: Existing Conditions

This section provides a comprehensive evaluation of the existing conditions in Clark County, including basic demographics, employment, and personal income. The demographics section includes a variety of human factors affecting the overall state of the local workforce. Those factors include: population, age, education level, and ethnicity. Employment and income are reported by economic sector, which is a set of local businesses by industry, grouped together according to similarities in the goods and services offered. Economic sectors are reported according to two-digit North American Industry Classification System (NAICS) codes. NAICS is a system developed by the United States government for grouping establishments into industries based on the primary activity with which they are engaged (<http://www.bls.gov/bls/naics.htm>). Assessing employment and income by sector will aid in the identification of those industries important to the economic sustainability of the region, and those potentially dependent on the activities taking place at the Sheep Station.

Located in eastern Idaho, Clark County is bordered by the state of Montana to the north. With a population density of 0.58 people per square mile, Clark County is dominantly rural (U.S. Census 2000). The county was established on February 1, 1919 and was named after Sam K. Clark, an early settler on Medicine Lodge Creek who became the first state senator from the County (<http://www.idaho.gov/aboutidaho/county/clark.html>). The county seat is Dubois, which is also the county's largest town. Spencer, ID is a small town near the Idaho-Montana border. Neither town houses a central retail outlet for purchasing goods and services. Because of this, residents of Clark County travel to nearby cities to purchase household goods and services. This substantially increases the level of "leakage" occurring in the Clark County economy. Leakage is money spent outside of Clark County, (i.e. an import

of goods and services), which may no longer contribute to the economy. When a local resident spends a portion of their income outside of the County, that money is then lost. Alternatively, local expenditures may be re-spent on other goods, services, inputs to production, labor payment, etc.; resulting in a multiplier effect.

According to 2014 data, the largest employment sectors in Clark County are agriculture and government (MIG 2014). Agricultural production has been the heart of Clark County's economy for many years. Producing a variety of crops and livestock, farming and ranching provide a valuable source of income for many local residents. However, depressed agricultural markets have led to lower returns for many farming and ranching households. In terms of household income, the government sector is relatively high paying. Thus, any government employment opportunities in Clark County serve as important income sources for local residents. Jobs supported by the Sheep Station make up a large proportion of Clark County employment and income. Therefore, it is important to assess the overall effects on the local economy that could result from changes to grazing on the Sheep Station.

Demographics

Table 1 reports the estimated 2009 population as well as the population reported under the 2000 and 1990 Census. While the state of Idaho has experienced population growth at more than double the rate of the United States, Clark County's population increased by 25 percent between the years 1990 and 2009. However, decreases were experienced between 2000 and 2009. In recent years, technological advances and complicated markets have forced an out migration of farmers and ranchers in some rural parts of the country. In some cases, residents of rural areas have moved to more urban centers in search of employment opportunities. This may account for some of Clark County's population decline between 2000 and 2009. Negative population growth in rural counties may have adverse effects on the economic health of sectors other than agriculture. As residents leave the area, they take their income with them and reduce the total income in the region. This results in a decreased demand for household goods and services and may affect the viability of local firms and business. Thus, the economy in Clark County has likely suffered from the recent decline in population.

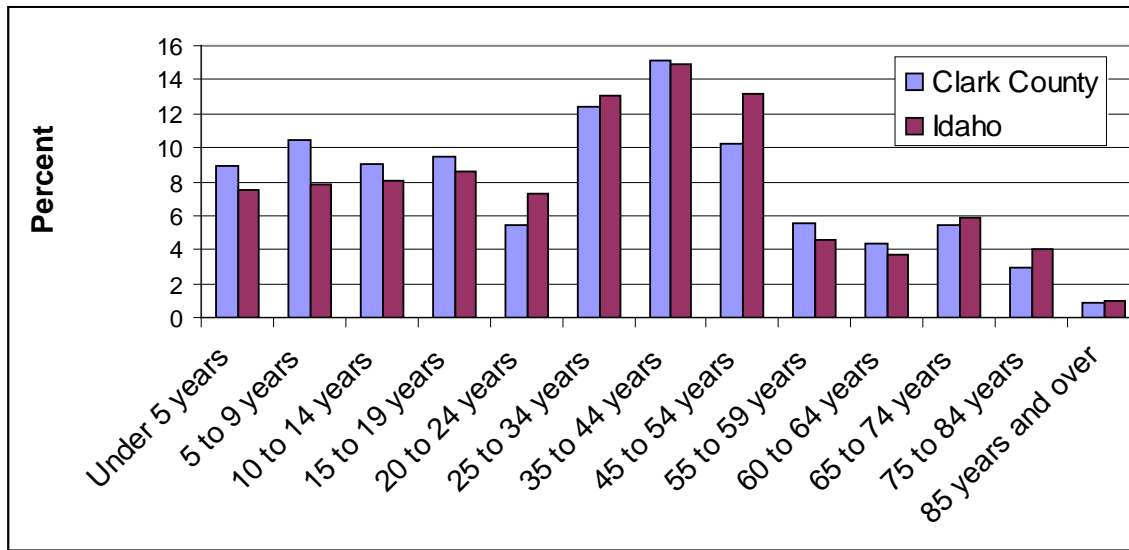
Table 1. Population change in analysis area counties

	Population (1990)	Population (2000)	Population (2009)	Population Percent Change (1990 - 2009)
Beaverhead County, MT	8,429	9,187	8,976	6%
Bonneville County, ID	72,608	82,867	101,329	40%
Clark County, ID	760	1,024	952	25%
Jefferson County, ID	16,589	19,214	24,802	50%
Madison County, ID	23,823	27,466	38,440	61%
County Region	122,209	139,758	174,499	43%
Idaho	1,012,384	1,299,551	1,545,801	53%
U.S.	249,622,814	282,171,957	307,006,550	23%

Source: U.S. Department of Commerce 2011

Clark County is predominantly middle aged. Figure 1 summarizes the age distribution for Clark County and the state of Idaho. Most individuals lie within the 25 to 54 year old age group, suggesting the majority of residents in the study area are of working age and likely dependent on their employment status to

support themselves. However, Clark County also has a relatively high proportion of individuals under the age of 19 relative to the state. Due to a lack of higher education facilities, the county has fewer residents in the 20 to 24 year old age group than the state average. Typically, agricultural areas with a declining population are losing young adults to more metropolitan areas because of better employment and educational opportunities. If this trend continues, the average age of residents in Clark County should increase in future years. Those areas with an older population typically have a higher percentage of retirees, and are thus less dependent on local employment conditions due to the influence of investment income and transfer payments from outside the local region (see discussion on labor and non-labor income below). However, retiree populations typically demand different goods and services than working age groups, and require better health care. In the case of Clark County, the lack of advanced medical facilities and retail outlets may weaken the in-migration of retirees.



Source: US Census 2000

Figure 1. Age Distribution by County and State

In many cases, retiree in-migration may improve the economic health of a community because they bring sources of investment income and transfer payments (e.g. social security), thus reducing the community’s dependence on labor markets as a source of household income. Regions with highly diversified sources of household income can typically better withstand downturns in economic conditions than areas generating the majority of income from labor payments in few economic sectors. In the case of Clark County, government and agriculture are the largest sectors in terms of employment and income. Labor markets in other sectors may not be strong enough to absorb increases in labor supply resulting from job losses in the two primary employing sectors. Furthermore, the lack of educational facilities and a diverse job market may force residents of younger age groups to migrate from the County.

Table 2 reports the racial and ethnic distribution for the study area and the state of Idaho. Hispanic or Latino may be of any race thus, people in each racial group may be either Hispanic or not Hispanic. Consequently, adding the shares of racial and ethnic groups in an area often results in a sum of greater than 100 percent. As depicted in Table 2, the majority of analysis area residents are white. However, the share of the population identifying themselves of Hispanic origin is greater in Bonneville and Clark counties than the share in the state.

Table 2. Race and ethnic distribution of analysis area counties

	White alone	Black or African American alone	American Indian alone	Asian alone	Native Hawaiian & Other Pacific Is. alone	Some other race	Two or more races	Hispanic or Latino (of any race)
Beaverhead County, MT	95%	0%	1%	1%	0%	0%	2%	4%
Bonneville County, ID	91%	1%	0%	1%	0%	5%	3%	12%
Clark County, ID	99%	0%	0%	0%	0%	1%	0%	47%
Jefferson County, ID	94%	0%	1%	0%	0%	3%	2%	10%
Madison County, ID	95%	1%	0%	1%	0%	1%	2%	6%
County Region	92%	1%	0%	1%	0%	3%	2%	10%
Idaho	92%	1%	1%	1%	0%	2%	2%	11%
U.S.	74%	13%	1%	5%	0%	5%	3%	17%

Source: U.S. Department of Commerce 2013

Employment

With the changes in population, and possible changes to industry composition, from the most recent publicly available employment data, a secondary data source is utilized to report employment and income. Minnesota IMPLAN Group (MIG) reports annual economic data for all counties in the United States (MIG 2014). MIG utilizes national, state and local data sources to report employment, and includes full-time, part-time, seasonal and self-employment. Therefore, IMPLAN data is reported simply as jobs, not full time equivalents (FTEs), and one person with multiple jobs will show up more than once in the data. This prohibits the comparison to local population data provided by the US Census.

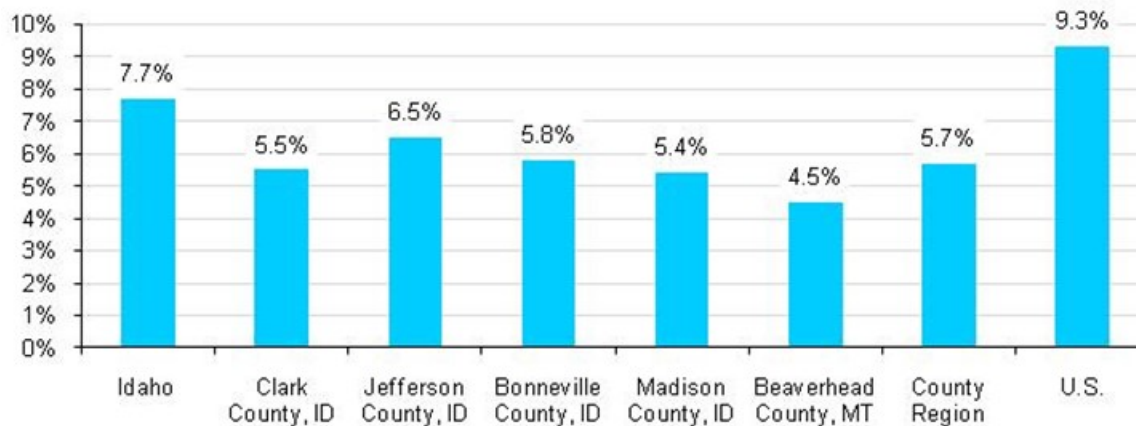
According to 2014 IMPLAN data, total employment is 1,090 jobs in Clark County and 101,366 in the 5-County analysis area. Table 3 reports the shares of total employment by industry at the two-digit NAICS level. The most prominent industries in terms of employment are the Government and Retail Trade sectors in Clark County and the 5-County analysis area, respectively. Jobs supported by the USSES are within the government sector and provide 21 percent of all Government employment in Clark County. According to 2014 IMPLAN data, there are 27 non-military Federal jobs. Currently the Sheep Station supports 13 full-time federal employees. In addition to these full-time positions, the Sheep Station also supports non-permanent jobs, including postdoctoral fellows, student interns, and intermittent general duty employees.

Unemployment rates in Clark County and Idaho have been on a decreasing trend in recent years, remaining below the national average since 2005. Relative to other states in the U.S., Idaho has greatly improved its employment conditions since 2000. In 2000, Idaho ranked 41 among all 50 states, but in 2007, Idaho had the second lowest unemployment rate. Such a drastic improvement in unemployment conditions bodes well for the economic health of the state.

Table 3. Employment in Clark County and the 5-County analysis areas by Sector

	Clark County	5-County analysis area
Ag, Forestry, Fishing & Hunting	12.9%	5.6%
Mining	2.7%	0.7%
Utilities	0.0%	0.2%
Construction	5.1%	6.2%
Manufacturing	10.3%	5.2%
Wholesale Trade	5.1%	5.8%
Retail trade	2.6%	12.3%
Transportation & Warehousing	7.0%	3.6%
Information	1.4%	1.2%
Finance & insurance	11.3%	4.2%
Real estate & rental	4.0%	4.3%
Professional- scientific & technical services	6.3%	6.5%
Management of companies	0.0%	0.3%
Administrative & waste services	7.3%	4.7%
Educational services	2.1%	3.1%
Health & social services	4.6%	11.8%
Arts- entertainment & recreation	2.1%	1.8%
Accommodation & food services	0.4%	7.5%
Other services	2.9%	4.6%
Government	11.8%	10.5%
Total	100%	100%

Source: MIG, 2014



Source: U.S. Department of Commerce 2011b

Figure 2. County, State and National Unemployment Rates, 2009

In 2009, Clark County and the 5-County analysis area had unemployment rates of 5.5 and 5.7 percent, respectively, which was lower than the state and national average (Figure 2). However, this could be due to a declining work force rather than job creation. Population in the county has decreased since 2000

(Table 1). Therefore, the number of people in the local labor market has also likely decreased. Thus, the unemployment rate may be an unreliable indicator of economic health.

Income

Another indicator of the overall health of the economy is household income. In 2014, household income for the state of Idaho was \$101,001, while in Clark County and the 5-County analysis area, household income was \$171,761 and \$105,222, respectively (MIG 2014). Personal income data in IMPLAN is separated into employment income, proprietors' income and other property income; and is reported according to NAICS.

Total labor income is the sum of employment income and proprietors' income. Total labor income in Clark County is \$36.5 million and \$4,139 million in the 5-County analysis area. Table 4 reports the proportion of total labor income within two-digit NAICS codes. The Ag, Forestry, Fishing & Hunting and Health & social services sectors are the largest sources of labor income in Clark County and the 5-County analysis area, respectively. Government accounts for the second and third largest component of labor income in Clark County and the 5-County analysis area, respectively; indicating a dependence on this source of labor income. Income generated by employment with the Sheep Station is included in the Government sector, providing a valuable portion of labor income to this important sector.

Table 4. Labor Income in Clark County and the 5-County analysis areas by Sector

	Clark County	5-County analysis area
Ag, Forestry, Fishing & Hunting	26.8%	8.1%
Mining	0.0%	0.5%
Utilities	0.0%	0.4%
Construction	0.3%	5.7%
Manufacturing	19.4%	6.4%
Wholesale Trade	11.0%	9.0%
Retail trade	1.3%	8.6%
Transportation & Warehousing	7.8%	4.9%
Information	1.3%	1.4%
Finance & insurance	2.3%	3.6%
Real estate & rental	0.1%	1.4%
Professional- scientific & technical services	2.8%	7.6%
Management of companies	0.0%	0.4%
Administrative & waste services	4.2%	5.1%
Educational services	1.7%	3.4%
Health & social services	3.0%	13.0%
Arts- entertainment & recreation	0.0%	0.4%
Accommodation & food services	0.4%	3.3%
Other services	0.5%	3.9%
Government	16.9%	12.9%
Total	100%	100%

Source: Minnesota IMPLAN Group 2009

In addition to returns to labor, income may also be generated through investments and transfer payments. Such income is also important for local economies because it allows for additional spending by households. The data reported below (Table 5) was collected from EPS (2007). This data allows for a better assessment of total income by source. Table 5 reports the total personal income by source for Clark County and the 5-County analysis area. A total of \$39.5 million in personal income was earned by Clark County residents in 2005. Income is generated from the following sources and proportions: payments for labor (68 percent), transfer payments (11 percent) and dividends, interest and rent (10 percent). Dividends, interest, and rent are forms of investment earnings, which, along with transfer payments, are considered non-labor forms of income. Transfer payments consist of a variety of government and non-government, non-labor income payments, including: retirement and disability, medical assistance, social security, unemployment benefits, welfare, and veterans' benefits. Earnings from dividends, interest, and rent are sources of investment income generated through financial investments or other property income.

Table 5. Total Personal Income by Source

	Beaverhead County, MT	Bonneville County, ID	Clark County, ID	Jefferson County, ID	Madison County, ID	County Region
Total Personal Income (\$1000)	\$293,011	\$3,541,487	\$39,582	\$638,616	\$685,410	\$5,198,106
Labor	51%	64%	78%	68%	63%	64%
Non-Labor	49%	36%	22%	32%	37%	36%
Dividends, Interest and Rent	26%	19%	10%	13%	14%	18%
Transfer Payments	23%	17%	11%	19%	23%	18%

Source: U.S. Department of Commerce 2011c

Assessing the proportions of the different sources of income across counties allows analysts to make predictions regarding the dynamic of county populations. Typically, counties with proportionally large amounts of transfer payments and interest income have a higher proportion of retirees and older residents than counties generating the majority of total income through labor payments. Conversely, counties composed of predominantly younger age groups are more dependent on employment opportunities and are consequently less resilient to adverse changes in economic conditions. Counties generating a large portion of income from non-labor sources have fewer residents dependent on their employment status as a source of income, and may better withstand downturns in the economy. In addition, counties with a large percentage of retirees are typically dominated by service-based industries, i.e. industries whose output caters to the demands of an older population. Similarly, counties with high levels of poverty (Table 6 and 7) tend to generate a larger proportion of income from transfer payments in the form of government aid. Clark County has a large proportion of individuals below the poverty level, which is reflected in the distribution of labor income sources. In 2009, 11 percent of personal income in the County was generated from transfer payments.

Commuting

In Clark County, the average travel time commuting to work is 20 minutes, which is less than the national average of 25 minutes (U.S. Census 2000). Table 6 reports the methods of traveling to work for Clark County residents demonstrating that the majority of the County's labor force drives alone to work. Table 7 indicates that the majority of the local labor force both resides and works in Clark County (79 percent). Most of the remaining workers commute to other counties within the larger 5-County analysis area. Management of the Sheep Station may affect local commuting patterns

Table 6. Method of Commuting to Work, Proportion of Clark County's Labor Force

Method of commute	Proportion
Car, truck, or van -- drove alone	65%
Car, truck, or van -- carpooled	19.6%
Public transportation (including taxicab)	0%
Walked	7%
Other means	0.7%
Worked at home	7.7%

Source: U.S. Census 2000

Table 7. County of Workplace, Proportion of Clark County's Labor Force

County	Proportion
Ada County, ID	0.2%
Bonneville County, ID	3.6%
Clark County, ID	79.0%
Custer County, ID	1.4%
Jefferson County, ID	15.8%

Source: US Census 2000, County-to-County Worker Flow

Environmental Justice

As stated in Executive Order 12898, it is required that all federal actions consider the potential of disproportionate effects on minority and low-income populations in the local region. The principals of Environmental Justice require agencies to address the equity and fairness implications associated with federal land management actions. The Council on Environmental Quality (CEQ) (1997) provides the following definitions as guidance for compliance with Environmental Justice requirements:

- “**Minority population:** Minority populations should be identified where either: (a) the minority population of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis...”
- “**Low-income population:** Low-income populations in an affected area should be identified with the annual statistical poverty thresholds from the Bureau of the Census' Current Population Reports, Series P-60 on Income and Poverty. In identifying low-income populations, agencies may consider as a community either a group of individuals living in geographic proximity to one another, or a set of individuals (such as migrant workers or Native Americans), where either type of group experiences common conditions of environmental exposure or effect.”

According to the US Census data reported in Table 2 above, Clark and Jefferson counties were composed of greater shares of populations than the state which identified themselves of Hispanic or Latino origin. Thus, according to CEQ (1997) minority populations in the Sheep Station economic analysis area should be identified and considered under the Environmental Justice criterion because the minority population in the study area is meaningfully greater than general population of the state.

Additionally, Beaverhead County, MT and Clark County, ID have larger proportions of individuals below the poverty level than both Idaho and the United States. Table 8 and 9 report the proportion of individuals

below the poverty level for all ages and for below the age of eighteen respectively. In Clark County, nearly 23 percent of minors are living below poverty level standards. Thus, it is important to consider the impact of alternative development scenarios on local income and the potential effect on minority and low income populations.

Table 8. Poverty Levels by County, All Ages

Location	Percent Below Poverty Level
Beaverhead County, MT	16.2%
Bonneville County, ID	11.9%
Clark County, ID	16.1%
Jefferson County, ID	11.1%
Madison County, ID	28.9%
Idaho	14.4%
United States	14.3%
U.S. Department of Commerce 2010	

Table 9. Poverty Levels by County, Under Age 18

Location	Percent Below Poverty Level
Beaverhead County, MT	22.9%
Bonneville County, ID	16.0%
Clark County, ID	23.4%
Jefferson County, ID	16.1%
Madison County, ID	18.2%
Idaho	18.5%
United States	20.0%
U.S. Department of Commerce 2010	

Environmental Consequences

Methodology

The primary objective of this section is to assess the effects of management alternatives on the economic environment. In order to assess the feasibility of each alternative, a financial efficiency analysis is traditionally conducted in the economic reports for NEPA documents. According to OMB Circular A-94, net present value (NPV) is the standard criterion for deciding whether a project is economically justifiable. Estimating the NPV for activities associated with the project alternatives should not be confused with an economic efficiency analysis. In an economic efficiency analysis, all costs and benefits are to be taken into account regardless of the ability to quantify them as monetary values. Such costs and benefits may include changes in ecological conditions or wildlife populations that are not monetarily valued.

The case of the Sheep Station is unique in terms of the financial qualities of the activities associated with each of the alternatives. The Sheep Station is an experiment station specializing in sheep productivity and grazing research. It operates under a federally-appropriated budget, and there is no commercial sale of sheep yielding any financial returns to the station. The Sheep Station operates under a cooperative

agreement with the University of Idaho, which is the entity that owns the sheep used for the research. The Agricultural Research Service is not authorized to retain the proceeds from the sale of livestock. Thus, any sale of sheep products by the University of Idaho are spent at the station for research purposes, the Sheep Station is not involved with the transactions. Proceeds to the University of Idaho are spent on the salary of university employees and on feed for the sheep.

The modified proposed action/no action alternative would result in the continued operation of the Sheep Station as it has done for many years. No changes to the existing conditions are proposed. Thus there are no additional monetarily valued costs and benefits to account for. It is assumed that adoption of this alternative would result in the continued operation of the Sheep Station well into the future. Since there are no monetarily value benefits and costs associated with the no action alternative, estimating an NPV or benefit-cost ratio is not applicable.

Any alternative that would result in reduced grazing utilization could affect the financial structure of the station. However, expenditure patterns on inputs to production would remain the same since the Sheep Station budget would remain the same. Therefore, a financial efficiency analysis would not yield useful information to decision makers.

In order to determine the economic consequences of action alternatives, an economic impact analysis is conducted. Economic impact analyses investigate the effects of the alternative development scenarios on employment and income in the study area. The relative size of the local communities plays an important role in the assessment of job and income impacts. Broader, more diverse, economies would likely be more resilient to changes in jobs and income than smaller, more rural, communities would. For example, a loss of ten jobs in a large metropolitan area would likely have very little impact on the overall health of the economy. However, the same loss in jobs in a small rural community could severely affect local economic conditions. Thus, when assessing the magnitude of impacts to employment and income across alternatives, it is important to keep in mind the relative importance of those economic factors to the specified analysis area.

Models of the local economy were built using IMPLAN¹ Professional 2.0 software and 2009 data. Changes in activity on the Sheep Station may have several different consequences for the economic condition of Clark County and the larger 5-County analysis area.

A change in economic stimulus to a region (e.g. increased production of a natural resource) will likely change the total level of jobs and income. For example, an increase in the level of cattle grazing allowed in a certain county will likely require ranching operations to hire more labor to perform the additional work associated with the increased production levels. In some cases, increased production may result in the migration of new agricultural producers to the area. Such increases in employment will also increase the total wages paid by the operations, which will raise total income in the county. Thus, firms within the agricultural industry are reacting directly to the increased grazing of the forage resource in that county. Similarly, now that there are more cattle on the market, local processing facilities (if they exist) will have

¹ IMPLAN – IMPLAN® is an input-output model describing commodity flows from producers to intermediate and final consumers. The total industry purchases are equal to the value of the commodities produced. Industries producing goods and services for final demand purchase goods and services from other producers. These other producers, in turn, purchase goods and services. This buying of goods and services continues until leakages from the region stop the cycle. The resulting sets of multipliers describe the change of output for regional industries caused by a change in final demand in an industry. The IMPLAN database describes the economy in 440 sectors. IMPLAN® is used to create complete, extremely detailed Social Accounting Matrices and Multiplier Models of local economies. MIG, Inc. provides software tools, region-specific data, and outstanding technical support to enable users to make in-depth examinations of state, multi-county, county or sub-county, and metropolitan regional economies <http://www.implan.com/>.

to compensate by increasing employment to handle the new production levels. Thus, both the ranching and processing operations must react to the increase in local cattle grazing. Such impacts to industries occurring from a change in local production are referred to as the “direct effects” of policy implementation. In other words, these are the impacts (i.e. change in employment) resulting from the changes in expenditures and/or production values caused by a policy to increase the cattle grazing occurring in the region.

In addition to hiring more labor, industries must meet the technical requirements associated with the increased cattle production by purchasing more equipment, supplies, and other inputs to production. Some of these purchases could be made from other local industries. For example, additional fuel purchased by the ranching operations at local gas stations increases the output in the oil and gas industry. Thus, the local gas stations may respond to the increased demand for fuel by hiring additional labor, which also affects total income; such impacts are called the indirect effects of the policy. The “indirect effects,” are the changes in inter-industry purchases as they respond to the new demands of the directly affected industries. Another type of indirect effect is referred to as “induced effects.” The induced effects reflect changes in spending habits from individual households as income increases or decreases due to changes in production. For example, an increase in employment in the Agriculture, Forestry, Fishing, and Hunting sector will be filled by unemployed individuals in the region and/or the in-migration of new households; and the increased income to those individuals will stimulate an increase in their demand for goods and services in the local area, which will in turn cause firms to respond by increasing employment and output.

Similar to the employment impacts, the total income in the study area would be affected according to the activities associated with each alternative. Total income is the sum of employee compensation, proprietors’ income, and other property income. Total income changes along with local employment levels. As reported in the case of employment impacts, income is generated through direct, indirect, and induced effects. Definitions for these effects remain the same as was stated in the employment impacts section above.

The case of the Sheep Station in Clark County is unique in terms of the economic stimulus it generates. Sheep grazing conducted by the station is for research purposes only, and is assumed not to have an effect on local markets for sheep products. Additionally, the alternatives developed for the EIS do not affect the availability of forage resources for local farmers and ranchers. Thus, grazing opportunities for private enterprises are assumed to be unaffected. Any purchases of supplies or inputs to production made in Clark County by the Sheep Station could affect local businesses. Such local purchases provide economic stimulus for local industries and could serve to benefit employment and income conditions. Furthermore, the Sheep Station serves as an important employer in Clark County. Employing around 23 people full time, the Sheep Station is the largest employer in the County. Nearly three-quarters of the employees at the station reside in Clark County. Thus a large proportion of income stays locally. Sheep Station employees may then purchase local goods and services, further benefiting businesses. Given the relatively thin economic base, if employees of the Sheep Station were to lose their jobs, they would likely be forced to migrate out of the local area in search of other employment opportunities. Economic impact analysis is conducted to estimate the impact of the alternative development scenarios on employment and income conditions.

Modified Alternative 1 - Proposed Action/ No Action

Under this alternative there would be no actions taken to change the structure under which the Sheep Station currently operates. Activities would continue according to current operating procedures, and there would be no change to employment and income initiated by the adoption of this alternative. There would be no direct, indirect or cumulative effects on the study area if no action were to take place. However, the

Sheep Station would make an economic contribution to the local economy. That contribution is reported in this section to serve as a baseline for comparison for action alternatives.

Direct and Indirect Effects

There are no direct and indirect effects that would result from implementation of the modified proposed action/no action alternative. The jobs and income reported in this section are currently realized under the existing conditions. Any reference to direct and indirect jobs and income are a result of regional economic modeling to estimate the total economic contribution of Sheep Station activities.

Expenditures by the Station have an economic contribution to Clark County and the larger 5-County analysis areas. Non-salary or operational related expenses made by the station largely occur outside of Clark County since opportunities to purchase supplies and equipment are not available within the county. On an average annual basis approximately \$415,000 is spent on feed, materials, supplies, equipment and services in the 5 county analysis area. As a result of these expenditures the station supports 5.7 total jobs (direct, indirect and induced) and \$181,000 in total income on an average annual basis. In addition, salary related expenditures by the station within the 5-County analysis area and support an additional 30.9 total jobs (direct, indirect and induced) and \$1,972,089 in total income on an average annual basis. Consequently, the Station supports 36.6 total jobs (direct, indirect and induced) and \$2,153,148 in total income within the 5-county analysis area on an average annual basis as a result of salary and non-salary related expenditures (MIG 2014).

While non-salary expenses by the station mostly occur outside of Clark County, salary related expenditures occur within Clark County to a greater degree. The 13 people employed at the station are paid a total of about \$1,400,000 in annual salaries. Of the total salary paid, about \$878,000 is earned by residents of Clark County. Thus, the direct contribution to employment and income is 13 jobs and \$878,000 in household income. Salary data for the Sheep Station was collected and a weighted profile of households by income group was developed for IMPLAN modeling. Table 10 reports the household income categories reported in IMPLAN and the proportion of total Sheep Station salary to Clark County residents allocated to each income group. IMPLAN incorporates the average expenditure patterns of households in each income group to estimate the impact of their spending in the local economy. However, given the lack of retail related and other household purchasing opportunities in Clark County (see Tables 3 and 4 above) it is likely that a large proportion of purchases of household goods and services are made outside of the study area. Thus, only a portion of total income should be applied to the economic model in order to estimate the total economic contribution. In other words, only the amount of salary paid to Sheep Station employees that are spent within Clark County should be accounted for when estimating indirect and induced jobs and income. Since there is no affirmative data regarding the purchasing habits of employees, the economic contribution was estimated assuming a variety of local household expenditure patterns. Table 11 reports the Sheep Station's contribution to Clark County's economy assuming local expenditure patterns of 5 percent, 10 percent, 25 percent, 50 percent and 75 percent of labor income. For example, at 25 percent, it is assumed that 25 percent of the salary is spent locally (i.e. 75 percent is spent outside of Clark County). The employment and income directly supported by the Sheep Station are 13 jobs and \$500,000 in salaries. The indirect and induced jobs and income supported are those generated from the economic activity occurring locally as a result of the Sheep Station's presence.

Table 10. Annual Income of USSES Employees Residing in Clark County

Annual Income	Percent of USSES Employees
Less than \$10,000	0%
\$10,000 to \$15,000	0%
\$15,000 to \$25,000	5%
\$25,000 to \$35,000	20%
\$35,000 to \$50,000	34%
\$50,000 to \$75,000	31%
\$75,000 to \$100,000	10%
\$100,000 to \$150,000	0%
Greater than \$150,000	0%

Table 11. Total Salary related contributions from a range of Station expenditures in Clark County

	Jobs	Percent of Total County Employment	Income	% of Total County Income
5 percent	13.2	1.21%	\$880,684	2.88%
10 Percent	13.3	1.22%	\$883,367	2.89%
25 Percent	13.8	1.27%	\$891,418	2.92%
50 Percent	14.7	1.35%	\$904,837	2.96%
75 Percent	15.5	1.42%	\$918,255	3.01%

Source: MIG 2014

The Sheep Station directly contributes 13 jobs and \$878,000 in income to Clark County. Its continued operation in the current economic environment would continue to support jobs and income of that magnitude regardless of the expenditure habits of local households and businesses. The household income earned by local residents would then indirectly support additional jobs and income. The level of indirect effects depends heavily on the expenditure patterns of local households. Table 11 reports the indirect and induced effects across a variety of local household expenditure levels. As regional economic theory suggests, the level of indirect effects increases with the level of local household expenditures. A positive relationship exists between household expenditures and indirect jobs and income because, as the proportion of income spent in the local economy increases, the amount of money that may be re-spent in the economy in the form of labor payments and inputs to production also increases. Indirect and induced effects range from 0.2 jobs and \$2,684 in income when households spend five percent locally, to 2.5 jobs and \$40,255 in income when households spend 75 percent locally. The importance of these jobs and income must be considered relative to the total economic base in the study area. Such a small level of jobs and income in an economically diverse community may be of little importance. However, in Clark County, the addition or loss of a single job may substantially affect the economic health of the community because the labor market in the County may not be able to respond to changes in demand. Similarly, the Sheep Station helps support a certain level of population base in the area. As populations change, so does the demand for local goods and services, including those associated with utilities and education. Thus, programs continued by the Sheep Station could also have implications for the social dynamic in terms of retail and service markets available, public services, and educational capacity.

Additive properties of the direct, indirect, and induced effects allow them to be summed in order to estimate the total contribution. Table 11 reports the total jobs and income supported by Sheep Station activities. Depending on the proportion of income spent locally, the total contribution could range from

13.2 jobs and \$880,684 in income, to 15.5 jobs and \$918,255 in income. This accounts for 1.2 to 1.4 percent of total employment and 2.9 to 3.0 percent of total income.

In addition to contributing to employment and income, activities at the Sheep Station also affect the total tax base. IMPLAN was used to estimate the contribution to local taxes. A total of 13 jobs in the non-military Federal Government sector were introduced into the model. Table 12 reports the total tax impacts from those jobs. The largest effect on taxes paid falls within the federal social security and income taxes. These taxes should have no direct bearing on the current state of Clark County’s economy as such funds are allocated to the federal government and are not immediately spent on local services. However, other tax categories such as property tax, motor vehicle licensing and sales tax may affect to the total funding available for operating services such as law enforcement, roads, and schools. Thus, the tax base supported by Sheep Station activities provides for improved social and economic conditions.

Table 12. Implications for local taxes

	Tax	Total Contribution
Federal Government Non-Defense	Corporate Profits Tax	\$40,326
	Indirect Bus Tax: Custom Duty	\$316
	Indirect Bus Tax: Excise Taxes	\$850
	Indirect Bus Tax: Fed Non-Taxes	\$90
	Personal Tax: Estate and Gift Tax	\$0
	Personal Tax: Income Tax	\$76,418
	Personal Tax: Non-Taxes (Fines- Fees	\$0
	Social Ins Tax- Employee Contribution	\$52,859
	Social Ins Tax- Employer Contribution	\$52,004
		Total
State/Local Government Non-Education	Corporate Profits Tax	\$5,973
	Dividends	\$424
	Indirect Bus Tax: Motor Vehicle License	\$160
	Indirect Bus Tax: Other Taxes	\$544
	Indirect Bus Tax: Property Tax	\$4,047
	Indirect Bus Tax: S/L Non-Taxes	\$153
	Indirect Bus Tax: Sales Tax	\$5,291
	Indirect Bus Tax: Severance Tax	\$22
	Personal Tax: Estate and Gift Tax	\$0
	Personal Tax: Income Tax	\$23,646
	Personal Tax: Motor Vehicle License	\$1,691
	Personal Tax: Non-Taxes (Fines- Fees	\$3,032
	Personal Tax: Other Tax (Fish/Hunt)	\$2,280
	Personal Tax: Property Taxes	\$415
	Social Ins Tax- Employee Contribution	\$854
	Social Ins Tax- Employer Contribution	\$1,668
		Total
	Total	\$273,063

Source: MIG 2014

In addition to economic stimulus in the form of employment and monetary flows, there is also the knowledge gained with the research conducted at the Sheep Station. It is the sole sheep research facility specializing in range sheep in the United States. Seventy percent of all sheep and lamb products produced in the Country come from the western states, the vast majority of which are range fed. Thus, the research conducted at the Sheep Station in Dubois is carried out in conditions very similar to those under which a large proportion of sheep producers operate (Orwick, 2008). Research valuable to the production of sheep and lamb products includes the mapping of specific genetic traits resistant to certain types of disease allowing for better health management, as well as the identification of traits important to both the maternal and paternal side of reproduction. Such information aids in the production efficiency of operations as the more healthy lambs born, the more competitive farmers and ranchers may be in today's dynamic agricultural markets. Furthermore, research regarding how sheep respond to drought cycles and the associated change in the nutritional value of plant species is valuable when dealing with issues of climatic change in rangelands. Thus, the activities associated with U.S. Sheep Experiment Station management have implications for agricultural productions across the Country, and have proven valuable to farmers and ranchers involved in the sheep industry.

Research valuable to the production of sheep and lamb products in the United States includes the mapping of specific genetic traits resistant to certain types of disease allowing for better health management, as well as the identification of traits important to both the maternal and paternal side of reproduction. Such information aids in the production efficiency of operations as the more healthy lambs born, the more competitive farmers and ranchers may be in today's dynamic agricultural markets. Furthermore, research regarding how sheep respond to drought cycles and the associated change in the nutritional value of plant species is valuable when dealing with issues of climatic change in rangelands. Thus, the activities associated with Sheep Station management have implications for agricultural production across the nation.

Cumulative Effects

The contribution analysis reported above simply provides an assessment of the jobs and income supported in Clark County under current operating procedures. There would be no changes to the current state of the economic environment under this alternative. Since there are no specific direct and indirect effects, there are also no measurable cumulative effects.

Effects Common to All Alternatives

Under all the alternatives there would be no change from the current socioeconomic conditions depicted above. The Station would continue to support 36.6 total jobs (direct, indirect and induced) and \$2,153,148 in total income within the 5-County analysis area on an average annual basis as a result of salary and non-salary related expenditures (MIG 2014). In addition, salary and tax related contributions within Clark County (Table 11 and Table 12) would continue to be supported on an average annual basis. Forage utilization and sheep numbers are expected to change under the alternatives however, the Station budget is not expected to change under any of the alternatives. As a result of decreases in sheep inventory or forage utilization employment associated with herding could decrease however, employment associated with other station activities would increase resulting in no net decrease in employment or total salaries paid. For example, research technicians could replace herders. Therefore, no changes to the Station employment, income or tax contributions depicted above are anticipated.

Cumulative Effects

No net change in employment and income effects are anticipated under all the alternatives since salary and non-salary expenditures made by the Station are not anticipated to change amongst the alternatives. Consequently no cumulative effects to local employment, income, or tax contributions would occur.

Effects Common to all Action Alternatives

Under all action alternatives there could be effects on the sheep industry resulting from potential reductions in research capacity at the station. Current research contributions to the sheep industry are summarized in the affected environment. U.S. Sheep Experiment Station research is dynamic; and therefore impossible to predict the full extent of impacts to sheep producers and the entire industry. However, it is reasonable to assume that if a reduction in grazing related research occurs, adverse impacts to the sheep industry could also occur.

Environmental Justice

The Environmental Justice principles set forth in Executive Order 12898 and CEQ (1997) were considered in regards to activities on the U.S. Sheep Experiment Station. Alternatives were reviewed to determine whether or not the modified proposed actions adversely impact minority and low-income populations. Salary and non-salary expenditures by the Station are anticipated to continue at current levels under all the alternatives thus no net change in current economic conditions is anticipated. However with changes in operations and associated station expenditures, adjustments in area employment and income could occur. Given presence of low income and minority populations in the analysis area, these populations could be affected by these adjustments. Regardless, any adverse indirect or induced effects would be spread amongst all segments of the population despite their racial, ethnic or poverty status.

While no net decrease in economic conditions is anticipated, the effects to human health of environmental justice populations are of concern. Comments received during public Scoping for this EIS noted that sheepherders of minority or low income status may be disparately effected by exposure to disease such as Rocky Mountain Spotted Fever (*Rickettsia rickettsii*), Lyme disease, human granulocytic, monocytic ehrlichiosis, babesiosis, relapsing fever, Colorado tick fever, tularemia, Q-fever, and tick paralysis. However, the alternatives do not increase time spent by herders in the field or possible exposure to such risks. In addition, such exposure risks do not present a disproportionate adverse impact on minority or low-income groups under the alternatives since the potential for adverse effects would be spread amongst all herders regardless of minority or low income status.. While herders may be predominantly of minority or low income status, any alternative that would reduce grazing would likely reduce exposure to the human health risks identified during Scoping, rather than increase risk for any ethnic or income group. Additionally, the alternatives would not cause any significant changes to community composition or the social dynamic of either the Clark County or the 5-county analysis areas. Economic and demographic composition would likely remain the same as a result of the alternatives. Therefore, there are no disproportionate adverse impacts to minority or low income groups.

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