

Sage Steppe Ecosystem Restoration EIS

United States
Department of
Agriculture

Forest Service



United States
Department of
the Interior

Bureau of
Land Management



Modoc County
California

January 2006

Scoping Report

Modoc National Forest and Alturas Field Office

Table of Contents

1	Introduction	1
2	Comment Categories	4
2.1	Rationale and Assumptions	4
2.2	Management Considerations.....	9
2.3	Range	12
2.4	Vegetation.....	14
2.5	Wildlife.....	17
2.6	Hydrology and Soils	19
2.7	Fire.....	21
2.8	Air Quality	22
2.9	Cultural Resources.....	22
2.10	Economics.....	23
2.11	Ecosystem Concepts	24
2.12	NEPA.....	26
2.13	Special Management Areas	27

List of Tables and Figures

Table 1. Public Scoping Meeting Locations, Dates and Number of Attendees	2
Figure 1. Distribution of Scoping Comments by Type of Organization	3
Figure 2. Distribution of Scoping Comments by Comment Category	3

1 Introduction

The Sagebrush Steppe Restoration effort began in a series of informal discussions between the Alturas Field Office of the Bureau of Land Management, the Modoc National Forest, and the North Cal-Neva Resource Conservation and Development Council that focused on wildlife habitat loss, accelerating juniper encroachment, soil surface degradation, and forage loss. Resource Concepts, Inc. an engineering and environmental consulting firm from Carson City, Nevada was contracted to develop a concept paper detailing the agencies' concerns, and presenting a strategic approach for future management. The product was entitled, "Western Juniper Management Strategy and Planning Proposal Analysis", and was submitted to the agencies on August 7, 2001.

This concept paper provided the foundation for numerous informal discussions with a wide array of public and private entities, as the problem statement and the strategic approach were refined and developed. Informal discussions were held with approximately 32 agencies, organizations, tribal entities, legislators, and individuals from 2000 to 2004.

Additionally, agency representatives specifically discussed the sagebrush steppe/juniper initiative on 18 separate occasions with the Modoc County/USFS Resource Advisory Committee, between December 1, 2001 and August 2, 2004.

Agency representatives also discussed the initiative with the BLM's Northeast California Resource Advisory Council on 13 occasions between June 2000 and August 2004.

Further, the agencies met with the Modoc-Washoe Experimental Stewardship Steering Committee four times between February of 2003 and June of 2005; and the Modoc County Land Use Committee 17 times from August of 2002 to August of 2005.

In a final effort to refine and further develop the agencies proposed strategy prior to distribution of the Notice of Intent which marks the beginning of the formal scoping period, eight public meetings were held throughout the Planning Area (Table 1) to solicit public comments.

The following preliminary considerations were identified from the comments received during those meetings;

- short term impacts on riparian areas,
- effects on visual resources,
- effects on wildlife habitat,
- effects on cultural resources;
- long-term potential for the introduction or spread of invasive species,
- impacts on rangeland permit holders,
- effects on nutrient cycling as a result of various treatment methods.

Table 1. Public Meeting Locations, Dates and Number of Attendees

Meeting Location	Date	Approximate Number of Attendees
Tulelake	August 24, 2004	18
Macdoel	August 25, 2004	12
Bieber	August 31, 2004	30
Fall River Mills	August 31, 2004	0
Alturas	September 2, 2004	15
Likely	September 3, 2004	2
Cedarville	September 14, 2004	15
Susanville	September 15, 2004	15
	Total	105

Formal scoping, again, reaches out beyond the decision makers and agencies and attempts to clarify the issues that are high in the public conscience. Comments that are submitted by the public and government agencies are reviewed and organized.

The formal scoping process for this effort began with the publishing of the Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) in the Federal Register on July 18, 2005. A Public Scoping Notice was distributed following the NOI and a public notice was published in the Modoc Public Record on July 28, 2005.

The scoping comment period ended on September 9, 2005. Some comments were received after this date but were still included in the content analysis and scoping report. This scoping report presents the results of a content analysis completed on the comments. Content analysis is a process that identifies specific, separate statements within each submitted letter and categorizes them. These categories will be used to help frame the public issues for consideration and further refine the proposal and developing alternatives in the EIS. The report also identifies points that may need to be clarified in the EIS.

The formal scoping process generated 23 letters from a variety of groups and individuals. Figure 1 displays the distribution of those letters by group. Those 23 letters contained 284 individual comments. Figure 2 shows the distribution of comments by category.

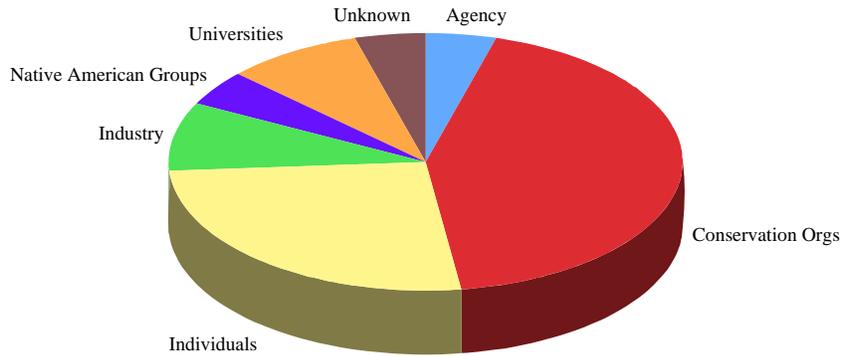


Figure 1. Distribution of Scoping Comments by Type of Organization.

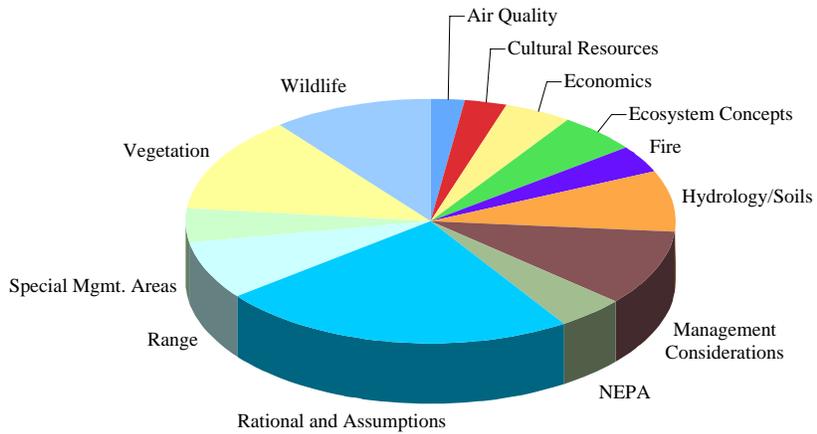


Figure 2. Distribution of Scoping Comments by Comment Category.

2 Comment Categories

The following 13 comment categories were identified in the comments submitted, and the discussion of the comments is divided into those categories.

- Rationale and Assumptions
- Management Considerations
- Range
- Vegetation
- Wildlife
- Hydrology and Soils
- Fire
- Air Quality
- Cultural Resources
- Economics
- Ecosystem Concepts
- NEPA
- Special Management Areas

2.1 Rationale and Assumptions

Nearly one third (28 percent) of the letters addressed the rationale and assumptions inherent to the purpose and need for the project as stated in the NOI. The majority of these challenged, disagreed with, or asked for clarification of the stated need for restoration or causes of juniper expansion. A few of these comments did express support for the project's goals and accepted the stated need for the project.

Some of the comments on the purpose and need make general statements about the project. Others address specific issues and challenge stated assertions in the NOI including the historical range of juniper across the landscape, the role of fire on juniper expansion, the magnitude of the proposed actions, the causes of the loss of biodiversity, and need for restoration for wildlife and hydrologic function of the area's watersheds. There were also a few comments about the stated objective of implementing the national renewable energy direction as it pertains to an assumed biomass plant.

2.1.1 General Comments

There were several general comments regarding the purpose and need. Some of these comments express reservations about the project. One commentor expressed concern that the fundamental assumptions upon which the purpose and need is based do not hold up to scientific scrutiny. Although not explicitly stated, many of the more specific comments on the purpose and need reflect this viewpoint. A few of the commentors indicated a belief that this project is really

designed to use tax dollars to improve livestock grazing and is concerned that grazing management will not be modified to prevent continuing problems. One stated that the purpose and need for juniper removal projects should be to increase ecosystem health, not just to improve livestock forage. Another general comment indicated a concern that the design of the project is not scientific and is looking for evidence that the methods and act of juniper removal will be effective in improving forage conditions.

Other commentors expressed their support for the restoration goals. There is support for the stated goals of improving wildlife habitat and improving forage. A comment lauds the project as a worthy goal, recognizing the substantial landscape alterations that the project will achieve. This comment includes a caution that given the scope it is critical that the best possible approaches are used. Another commentor supports the viewpoint that juniper expansion is a real concern and destructive to the landscape. This commentor supports the programmatic approach of this EIS that can then facilitate detailed project designs that would be tailored to site-specific circumstances. The California Department of Fish and Game expresses support for the removal of juniper, provided that the areas are regenerated with sagebrush or bitterbrush.

2.1.2 Magnitude of the Project

There were many comments that specifically mentioned the magnitude of the project. All but two of these comments express reservations about conducting restoration over such a large area and timeframe. One commentor stated that “the magnitude of the project is stunning,” and another expressed a view that the ecosystem should not be disturbed over such a large area. These comments also express concern over the length of time to achieve the goals, particularly in light of continuing juniper encroachment. Some of the comments indicate support for juniper removal but on a smaller scale, believing that the scope of the proposal is not warranted or justified in the NOI. One suggestion is that the scope of the project be reduced and coupled with an aggressive program to prevent further juniper encroachment. This is echoed by a comment that states that the scope of the project is too large given an assumed lack of definitive scientific research on juniper expansion and control that support the project. These commentors are generally looking for a more modest approach coupled with monitoring the areas of juniper removal to determine the most effective approaches and to verify that juniper removal will achieve the stated goals.

Several of the comments support the project scale. One from the California Department of Fish and Game indicates support of the scale, adding that after numerous small project proposals it is good that the agencies are considering a landscape scale project. One comment stated that the scale and pace may not go far enough and points out that juniper encroachment is at a rate of 50,000 acres per year. This comment expresses concern that the project won't be able to get ahead of juniper invasion.

It is also suggested that there is a need to conduct landscape level assessments to understand the ecological principles before it is appropriate to develop a range of alternatives for landscape-level management.

2.1.3 Historical Range of Juniper

There were 32 comments addressing the Purpose and Need statement about the historic range of juniper across the landscape. Many of these comments are accompanied by supportive citations. These comments challenge some of the justification for the project in the NOI. Many indicate skepticism regarding the use of the year 1887 as a benchmark and make the point that juniper has expanded and contracted naturally over time in response to complex factors, often climatic. Some of these comments assert that by 1887, the range of juniper had already been significantly reduced by human activities.

Many commentators consider the use of one particular time period as arbitrary as a reference for historic juniper conditions and suggest that the project must consider the range of juniper over a long time period. These comments emphasize the need to understand the dynamics of juniper expansion and contraction including fire, climate change, and anthropogenic causes. One comment states that “the assumption that only 198,000 acres of juniper is naturally occurring out of approximately 3 million acres simply because that is what existed in 1887 is without merit.” Others ask for scientific data or sources for the assertions regarding juniper expansion including the Purpose and Need statement that Western juniper has increased 15 fold over the past 100 to 150 years.

Many individuals commented on complex interactions driving juniper expansion citing climate as a major factor. These comments challenge the Purpose and Need statement that the expansion of juniper is largely attributed to the removal of fire from the landscape, and are critical of the Purpose and Need in not acknowledging other driving factors such as climate and grazing practices. They also state that there is a difference of opinion among scientist as to the reasons for juniper expansion and that this should be acknowledged, but that generally, fire suppression is not considered a primary cause. Some of the comments assert that a warmer and wetter climate during the past 150 years has allowed juniper, which is limited by moisture, to expand. A commentator stated that the current extent of juniper may be within the historic range and that it may have covered even larger areas in the past. Another commentator is skeptical that fire could be a driving force of juniper expansion, stating that fire suppression could not be the cause of juniper expansion over such a large area primarily because most of the historical sagebrush had long fire return intervals. This commentator requests an accurate documentation of the fire history of the planning area.

One comment was that human activities beginning around the mid 1800s sought to reduce juniper and interrupted what was a natural expansion of juniper. This comment looks at the current rapid expansion as a resumption of a natural cycle that was interrupted 150 years ago. One commentator also believes that the current range of juniper should not be considered “unnatural” but does point out that the current episode of expansion is unusual not because of its size but because it is occurring during a predominantly dry period, which contradicts the assertions that juniper is expanding because of a unusually warm and moist period.

2.1.4 Role of grazing and fire

There are 18 comments that specifically address the purpose and need as it relates to grazing and fire as disturbance factors. Most of the comments are critical of the omission of grazing in the NOI as a significant factor in juniper expansion, and an important management concern for the project. A variety of comments point to livestock grazing as a cause for alteration of herbaceous vegetation, reduction of fine ground fuels, a subsequent alteration of the fire regime, and introduction of non-native invasive species. In these comments there are many inferences to a concern that by not acknowledging the critical role-played by grazing management practices, the restoration approach will not adequately restore the processes that maintained the sagebrush steppe ecosystem. Several comments present research that supports their contention that grazing weakens herbaceous plants so that they cannot out-compete juniper, while vigorous grassland can exclude many juniper seedlings. This effect, according to some commentators, is as, or more, significant than fire suppression.

There is concern about the long-term effectiveness of restoration of the landscape if actions are not taken to truly achieve a functioning ecosystem by addressing the fact that grazing occurs across nearly the entire Modoc Plateau. Merely removing juniper will not address the processes that led to the current problem. One comment is that the EIS needs to describe in detail how livestock grazing will impact the outcome of restoration activities. It is also asserted that by not addressing grazing management the project could ultimately result in an expenditure of time and money that does not achieve the restoration goals and may even push the ecosystem into a further degraded state. One commentator states;

“Removing juniper from public lands is not economically or ecologically justified if the lands will continue to be managed in such a way that juniper will simply reinvade.”

Many comments link the altered fire regimes to grazing management, alluding that fire suppression is only one part of the equation. One comment expresses a concern that the project’s goals are not attainable and questions whether it is possible to return to historic fire cycles on lands where the historic vegetation, soils and disturbance factors have been radically altered from historic conditions. Other comments stress the need to document the fire history and historical return intervals of the planning area and find ways to restore fire to its natural role on the landscape. It is also suggested that areas that have experienced fire suppression be examined to determine if juniper expansion in those areas fit the hypothesis.

One commentator states that the solution to juniper encroachment is the reintroduction of fire and elimination of grazing in grassland and desert ecosystems.

A couple of comments indicate support for the effort to consider juniper management and support the use of fire as a tool but also emphasize the need to recognize that a fundamental cause of western juniper expansion is the introduction of livestock to sagebrush ecosystems. These comments urge a restoration of fire’s role in the ecosystem and a full analysis that considers the interrelationships between juniper, native grasses, exotic weeds, fire, and livestock grazing.

2.1.5 Wildlife Goals

Several comments were submitted about the purpose and need's statement regarding wildlife. There are also numerous comments about wildlife species not specifically mentioned in the Purpose and Need, particularly birds, and the importance of juniper habitat to these species. These comments are discussed under the Wildlife Issue (below). However, two comments were submitted that disagree with the inference in the Purpose and Need that juniper has little or no habitat value and its expansion is an unnatural or undesirable condition. It is stated that these are important plant and wildlife habitat communities.

Another comment stated that if improving sage grouse populations is one of the goals, the priorities are incorrect. They cite a finding recently issued by the US Fish and Wildlife Service, which cited known threats to sage grouse. According to these commentors, piñon-juniper expansion was last on the list.

The need to improve forage for deer is also questioned. The presumption is that the Purpose and Need implies that juniper negatively impacts habitat for deer and the commentor requests scientific support for the assertion. This comment states that recent population declines have been observed over the past 30 years but that juniper have been encroaching for 130 years and looks for other causal factors.

2.1.6 Biodiversity

The purpose and need states that the conversion of the sagebrush ecosystem to a juniper woodland cover type has "resulted in a dramatic loss of biodiversity on the landscape." Most of the comments on the Purpose and Needs' stated goals question this premise and ask for additional evidence that this project will result in the restoration of natural ecosystems and processes. Many comments, both specifically discussing biodiversity, and discussing the various factors in juniper expansion, stress that simply removing juniper will not be enough to "restore sagebrush ecosystem vegetation composition, structure, function and configuration." It is requested also that the focus of the project should be on the restoration of the entire ecosystem with special emphasis on soil properties, cryptobiotic crusts and native seed banks.

Comments that challenge the premise of juniper's effect on biodiversity claim that there is no consistent resulting effect on biodiversity due to juniper encroachment and that bird diversity and species richness are consistently higher in juniper woodlands than neighboring big sagebrush communities. One commentor stated that it has been shown in Oregon that the communities that are highest in diversity were a mix of sagebrush and juniper, expressing concern at the possible loss of these habitats. This comment also asserts that the age and structure of juniper stands may be a more important determinant of diversity than simply looking at species composition. These comments include numerous citations of scientific literature supportive of their claims. Several ask for scientific evidence of the claims regarding loss of diversity. Other comments cite research that challenges the claim that juniper is detrimental to the ecosystem and that a literature review failed to find evidence contradicting this research or proving that juniper removal will achieve the stated goals to "restore biodiversity and productivity to these ecosystems." It is felt that there is

insufficient evidence that the project will result in this kind of true restoration. Finally, another comment states that the agencies involved have been removing juniper from these ecosystems for decades and asks whether biodiversity has been improved in the areas of juniper removal. The commentor would like the EIS to include information on the history of previous attempts to replace juniper with sagebrush.

One commentor that supports the conclusions of the Purpose and Need statement, states that most scientists believe that the expansion of western juniper has reduced the diversity of sagebrush steppe ecosystems. This commentor states that Joy Belsky, who is often cited by commentors critical of the contention that western juniper woodlands in the Northwest are currently expanding at an unprecedented rate, supports the significant decline of herbaceous production.

2.1.7 Biomass

The Purpose and Need does not specifically address the use of removed juniper to fire a biomass power plant, however, many commentors assume that the statement “implementing, where appropriate, national renewable energy direction,” is referring to that use. Most of these commentors are concerned with the economics of the project and are discussed under the issue “Economics-Use of Biomass.” However, one comment takes issue with the project, particularly upon seeing treatments in higher elevation forested communities. This commentor feels that the real purpose of the project is to benefit ranchers and local contractors for biomass use. Another remarks that the common assumption that a biomass power plant is “green energy” is untrue, citing the numerous pollutants generated by burning. This commentor suggests a program of replacing the biomass that is removed to mitigate the generation of carbon dioxide.

2.1.8 Hydrologic Function

Several comments address the Purpose and Need as it pertains to hydrologic functions. Three of these comments challenge the assertion in the NOI that juniper stands “substantially degraded hydrologic conditions on many watersheds.” These commentors state that these statements by the agency are not supported by scientific evidence and are merely anecdotal; there is no verified data that show a link between juniper and altered hydrologic regimes. Without evaluating the actual effects of juniper encroachment on soil water balance, agencies cannot reasonably conclude that juniper out-competes other species for water. Any on the ground studies would need to factor out the impacts of grazing, particularly as management of the area is modified. One commentor questions whether it is the expectation of the project that streamflows will improve as a result of restoration and requests evidence to back up any claims to that effect. One commentor does support claims that western juniper degrades hydrologic function.

2.2 Management Considerations

Many commentors addressed some basic management considerations. Most of these comments are addressed to the implementation of the project, or use of monitoring and adaptive management to most effectively achieve the desired results. Some of the comments are

concerned with the role of special interests that may be driving the project forward. One comment suggested that;

“The EIS should prohibit new road building as a means to accomplish juniper treatments because new roads pose a risk of introducing noxious weeds, off road vehicles and other management problems.”

2.2.1 Adaptive Management and Monitoring

Many of the commentors expressed a concern about the large or “unprecedented” scale of ecosystem modification and have reservations about going forward without a reliable feedback loop that will prevent large-scale mistakes. Many commentors are supportive but urge caution going forward. They are concerned that there is a lack of history or science regarding removal of juniper and sagebrush steppe restoration, and that the project should only go forward if there is funding and staff available to monitor the effectiveness of treatments. It is also stated that there is a lack of research as to what the likelihood of shrub regeneration will be, a particular concern to ungulates and several wildlife species.

This group of comments specifically request or imply that a cautious, experimental or adaptive management approach be at the core of all action alternatives and that the treated acreages should increase slowly, or in steps, to allow for adjustments as the agency learns what is the most effective treatment and where these treatments are most effectively applied. The treatments should be organized specifically to allow the agency to learn from the results. It is suggested that the treatments begin by focusing initially on areas that are the most economically feasible and that the agencies experiment with different grazing patterns, rest patterns, and intensity of grazing rotations. It is also suggested that some areas could experiment with goats that eat juniper. After an initial experimental phase, agencies could ramp up the scope and scale of treatments that have proven effective.

Many commentors indicate that full-scale treatments should not be considered until more knowledge is gained as to what vegetation will successfully regenerate in treated areas. It is also asserted that the adaptive management approach needs to allow for flexibility in the expectations of acreage treated and timeline for completion. It is suggested that this type of approach would allow for adjustments if recovery is slower than expected or if there is unanticipated encroachment of cheatgrass, particularly in areas of poor recovery. The point is made that it is important to establish a trajectory for recovery. Then, if the treated areas begin falling off this trajectory, modifications or delays of additional treatments would be triggered as treatment methods and locations are adjusted.

Similar comments warn of the inappropriateness of “locked-in” output levels, particularly on a project of this scale. A part of this concern is the establishment of community expectations that are beyond what the monitoring and scientific review will show to be ecologically sustainable levels for this ecosystem. Output levels determined at any level should carry the caveat of possible revision based upon responses to new information and effectiveness of treatments over time (adaptive management).

Some of these comments stress the importance of regular policy and scientific review by scientific professionals, particularly from universities and research stations. One suggestion is the establishment of a permanent scientific advisory committee made up of ecologists, wildlife biologists, fire scientists, cultural and other resource management professionals, and other technical experts to guide the EIS, as well as its implementation. It is also recommended that all biologists and managers in the US Forest Service and BLM play an active role in the sagebrush steppe restoration and EIS.

The need for a complete and rigorous monitoring program is frequently mentioned in these comments, both to determine whether the treatments are effective in achieving the stated goals and whether there are unintended consequences. It is suggested that all alternatives need a scientifically designed protocol for monitoring the effects of treatments and look to a university or research station to assist in the design. However, a concern is raised that the agency will not have the resources to fund and conduct the surveys required by NEPA over 6.5 million acres. It is also suggested that if funds are not available for this type of monitoring program, that the project should not go forward until those funds are available. Several commentors request that the monitoring plan be disclosed along with associated funding. Photo monitoring is mentioned as an especially effective monitoring method (comment includes references).

A final comment on adaptive management recommends that the EIS produce a list of management practices that will maintain and restore the ecological balance of the sagebrush steppe ecosystem. This should be aimed at preventing subsequent juniper expansion from reclaiming previously treated sites in a few decades. For example, it may be necessary to rest a site from grazing for a specified period after prescribed fire.

2.2.2 Special Interests

Several commentors are concerned that special interests are driving the process. A request is made for the scientific basis for the “desired future condition.” The discussion of the comments on the purpose and need show a concern that grazing interests and private energy companies are influencing the need for the project (see above). Additional comments remark that the scoping notice reveals a range-biased examination of western juniper, excluding consideration of its benefits, and request that the agency involve foresters and ecologists, not range professionals in the process. It is suggested that many Western land grant colleges and their extensions and research are inherently biased. Peer review of the project should be by foresters and ecologists not currently employed by agriculture departments or land grant colleges. Another comment is that the current federal administration and political appointees in the BLM want to see implementation of this project. The concern is that the objectivity of local BLM and Forest Service personnel is in question when there is pressure from higher officials.

There is also a request from a conservation group that mining, drilling, logging and grazing be banned from the area. Another suggestion is that hunting and trapping be eliminated.

2.3 Range

There were many comments regarding the impacts of grazing on the ecosystem and management of grazing in the planning area. Some of these comments were discussed previously under Purpose and Need – Role of grazing and fire and reflect a viewpoint that grazing is a major disturbance factor that is at least as significant as the absence of fire in juniper expansion. In those comments, grazing is discussed as playing a role in altered fire regimes.

In this section the comments on grazing focus on management issues surrounding grazing and the proposed actions. This includes the impacts of grazing on soils and vegetation, impacts regarding utilization of the land for grazing, and management of the land after juniper treatments.

2.3.1 Soil and vegetative impacts due to grazing

These comments suggest that grazing has impacted both soils and on-site vegetation, reducing biodiversity and altering historic fire regimes (see Purpose and Need – Role of grazing and fire). Some of the impacts of grazing that the comments point to are erosion of the topsoil from trampling and removal of vegetation, and elimination of an understory in many areas, making it difficult for the areas to carry a low intensity ground fire, which may prevent the establishment of juniper seedlings. It is also mentioned that grazing may reduce the number and health of herbaceous plants such that they cannot out-compete juniper seedlings. The comment is that vigorous grasslands can exclude the establishment of juniper. These comments often point to grazing as responsible for current problems or lack of diversity as much as juniper replacing sagebrush.

These comments generally assert that better livestock grazing practices are essential to effect a permanent restoration of areas currently occupied by juniper. It is stated that all planning alternatives must incorporate plans to improve range management and that healthy soils and native seed banks should be emphasized in these plans. The EIS document should analyze and disclose any contributions to juniper encroachment due to impacts to soil and understory vegetation by livestock grazing. One comment expresses a view that the costs of restoration should be carried by the livestock industry, as this industry has been federally subsidized, and presumably will benefit from restoration and is at least part of the disturbances that have created a restoration need.

2.3.2 Utilization of the land for grazing

Comments in this category generally reflect a belief that the agencies need to recognize and deal with the problems created by the current level of utilization and grazing management practices on the land, despite resistance from the livestock industry to modify practices or reduce the number of allotments. It is stated that grazing reform may meet with substantial opposition but that the benefits would ultimately be substantial to all.

It is suggested that the BLM and the Forest Service should complete a current livestock grazing suitability analysis. Only lands that are producing 200 lbs/acre or more of forage should be considered suitable for grazing. These areas should be documented and mapped. Another suggestion is that in the EIS, a suitability analysis for range include an examination of slope,

distance to natural water, dispersion of forage across the landscape, areas inaccessible due to snow, summer desiccation, etc.

In order to maximize the chances of successful restoration, it is suggested that the agencies consider reducing the utilization of the range by retiring grazing permits and implementing sharp reductions in livestock numbers as a viable alternative. Once the lands to be treated have been removed from grazing, restoration could progress. Another suggestion is to reduce livestock numbers to manageable levels and only continue grazing on lands not susceptible to invasive species.

2.3.3 Rest periods and post treatment livestock use

One concern that is frequently reflected in the comments is that the post treatment uses of the land, particularly with regard to grazing, will not be compatible with successful restoration. Comments on this topic specifically address rest periods from grazing during and after treatment. Many comments regarding the Purpose and Need expressed concern that the project would ultimately be a waste of taxpayer money if grazing management is not appropriately addressed (see Purpose and Need discussion). A specific comment is that this project is a massive investment in restoration and that post treatment of the lands must be managed for success. It is suggested that any treated areas be rested from grazing for a minimum of 5-10 years with specific, measurable standards of recovery. The assumption is that a sufficient rest period would support the establishment of sagebrush and perennial grasses and forbs. It is also stated that a rest period of two years is often inadequate. When the lands are reopened to grazing, stocking rates on treated lands should be sharply reduced to protect the ecological health and economic investment. It is stated that ultimately agencies must establish standards of protection to prevent continued livestock damage to the lands and to allow recovery. One commentator believes that recent agency livestock grazing decisions have not done this and therefore these decisions cannot be used as a basis for portraying current impacts.

It is also suggested that the EIS should identify areas where grazing is unsustainable, or where it will cause harm to vegetative communities that are still intact. The EIS should also identify areas where grazing would impede short or long-term recovery of sites following treatment. There also is a concern that the treated areas will become very attractive to livestock producers because of the improved forage conditions. Treatment areas must therefore take into account the potential patterns of use by livestock and appropriateness of treatment.

One question raised is that, given the nearly full utilization of the Modoc plateau for grazing, how could this project incorporate rest periods into the implementation of the project? It is believed that the EIS needs to provide strategies for managing livestock while grazing allotments are being treated. One suggestion is the promotion of a voluntary grazing permit buyout program or legislation to aid ranchers who desire to scale back operations or are considering retirement. Another suggestion is that federal agencies should retire grazing permittees whenever possible to assist with implementation and long-term restoration.

One commentor suggested considering grass banking as a strategy that has been used in other areas to move livestock off of certain areas. The difficulty for this planning area is that there is nearly 100 percent utilization of suitable range lands. Additionally, a commentor emphasizes that the agency would need to examine the environmental impacts of any proposal to convert vacant federal lands into grassbanks. One concern would be whether moving livestock from an allotment targeted for restoration onto an ungrazed area would cause juniper to spread on to the banked area. The question is, what are the tradeoffs of such a program?

Finally, one commentor suggests that this project should be an opportunity to look into innovative experiments being conducted on ranches in the west and to take a leadership role in range management. The Modoc National Forest and Alturas Field Office have opportunity to take a leadership role in experimenting with approaches to improve grazing patterns to decrease ecosystem damage.

2.4 Vegetation

2.4.1 Juniper

Many of the comments on juniper make specific requests of information that should be provided in the EIS. Comments include a request that the EIS present a scientific description of the history of the juniper woodlands and that a professional ecologist evaluate whether the presence and density of juniper is within the historic range. It is also suggested that the EIS provide discussions that examines all the causes of juniper expansion including; grazing, topsoil loss, change in site potential, climate change and increased atmospheric carbon dioxide. One question that is posed is whether conditions have changed such that the current condition provides an adaptive advantage to juniper over other species. It is also questioned as to whether juniper is moving back into areas from which it had been eradicated, or whether it is possible that site conditions now favor juniper over sagebrush. The implication of these comments is whether restoration can be successful if site conditions today are substantially different from what existed historically.

One commentor brings up a concern over new and unexplained mortality of juniper that is occurring in eastern Oregon. There is a further suggestion that the EIS provide a current and detailed assessment of juniper conditions across its range, including reports of escalating mortality. It is stated that a cautious approach is warranted given possible and uncertain reductions in juniper elsewhere in its range.

There are several comments that express a concern about the mechanics of the restoration and juniper removal. One comment asks for an explanation of the scientific basis for a determination that 20 percent canopy cover is the point at which it may become viable to remove juniper as a biomass product. Another asks that the EIS display the rationale for recommended treatments. In particular, the basis for using canopy cover and precipitation to design treatments must have a basis in science. It is suggested that the EIS will need to differentiate between the unique Sierra

Nevada sub-species of juniper and other species. It is stated that removal of any unique species would threaten unique components of California's flora.

The risk of regeneration of juniper in treated areas is also of concern to some commentors. For example, one has suggested that juniper clearcutting near Alturas has resulted in regeneration of juniper in densities that are equal to or in excess of pre-treatment densities. The concern is that the project could inadvertently contribute to the further expansion of juniper. Another concern is the site regeneration potential following fire and juniper removal during drought conditions. More specifically, would there be synergistic effects from juniper removal, possible fire, grazing and drought that would cause additional problems for achieving the goal of sagebrush restoration?

2.4.2 Noxious Weeds

There are many comments that recognize that non-native invasive species pose a significant risk to the ecosystem and native vegetation, and acknowledge a body of scientific literature about the vulnerability of arid lands to noxious weed invasion following disturbance. The comments do not reflect any controversy as to the seriousness of this problem but primarily vary in the types of measures commentors feel should be taken to document conditions and prevent further invasions. It is recommended that the EIS require a thorough and systematic baseline inventory for invasive species across the landscape. It is recommended that before an area is considered for treatment, the EIS must first assess the vulnerability to noxious weeds following fire or other disturbance.

It is also suggested that the EIS should explicitly state that one of the project's goals is to restore native plant communities in all areas where juniper is removed. This would require using only native species for seeding and carefully considering how to manage invasive species problems. Management strategies should consider the potential to exacerbate the spread of invasive non-native species and take measures to minimize this effect. In some highly sensitive cases, burning of individual juniper trees may be necessary to avoid ground disturbance that would invite weed invasions.

Roads are mentioned as a conduit for the spread of non-native invasive species. It is suggested that a current inventory of roads be prepared and that all alternatives make a careful assessment of new road locations in relation to areas most at risk to noxious weed invasion. It is stated that recently burned or treated areas will invite OHV use even if closures exist. It is also suggested that all new roads and two stroke vehicles should be banned from treated areas to prevent new introductions.

It is asserted that the EIS must disclose impacts from any new road construction and the possibility of exacerbating noxious weed invasions along each specific road segment and the area one-mile from existing roads and areas of isolated treatments. Also, the EIS must disclose ground disturbance and how this affects the proliferation of noxious weeds.

Cheatgrass is specifically mentioned as an invasive species that is of particular concern. There is a concern that the project will implement the removal of juniper and increase cheatgrass in the process. It is suggested that juniper treatments should be limited to those areas where there is only a low risk of increasing the spread of cheatgrass. More specific suggestions include

limiting treatments on drier and lower elevation sites as well as in dense juniper stands and considering longer pre- and post-treatment grazing rest periods. One comment recommends that the EIS mandate the use of fire as a primary tool to eradicate flammable invasive species such as cheatgrass.

Some concern is brought up about the risk of desertification. It is requested that the EIS assess the current levels and degree of desertification that has occurred across the landscape and adjacent lands. It is stated that this is a necessary step to understand the potential suitability of the land and potential ramifications of vegetation manipulation and continued grazing. It is also requested that the EIS assess the role of exotic invasive species on the process of desertification.

2.4.3 Old Growth

There are several comments that express concern about preservation of old growth juniper, making the point that junipers that are from the pre-1850s era are not part of the current juniper expansion and should not be removed. It is requested that the EIS incorporate guidelines that only post-settlement trees are to be targeted for removal and that all old growth junipers pre-dating effective fire suppression be retained (approximately 100 to 150 years in age). There is also concern that the age of junipers be appropriately evaluated stating that even some of the oldest junipers (up to 1,000 years) do not exhibit characteristics such as a large diameter trunks. Other metrics should be used including the presence of lichen characteristic growth form.

According to one commentor, the BLM has identified and mapped approximately 200,000 acres of “original” old growth juniper and would like acknowledgement and protection of these areas in the EIS. In areas where old growth is present, it is suggested that treatments use only selective methods, such as hand removal of marked trees.

2.4.4 Sagebrush

There are only a few comments specifically about sagebrush. One of these is a concern about the condition of the existing sagebrush in the planning area. It is asserted that all of the alternatives need to include measures to protect and repair damage in existing sagebrush, in part to reduce further juniper encroachment. Since restoration to a sagebrush steppe ecosystem is the desired condition, the project should protect that condition where it exists. The point is also made that sagebrush is very slow to regenerate and that seeding may be required in areas that do not have an adequate seed source. Finally, it is asked that the EIS not ignore the value of mixed composition communities such as sagebrush mixed with juniper. Removal of juniper in these areas may alter or destroy important structural attributes.

2.4.5 Special plant communities

A couple of comments request clarification regarding treatments proposed in aspen or higher elevation forests. The need for treatments in these areas is questioned as well as what species are to be removed. It is also requested that the EIS carefully catalogue the plant species composition across the landscape including where old growth and special plant communities occur.

2.5 Wildlife

2.5.1 Birds and small mammals

Nearly one-third of the wildlife comments address the importance of juniper habitats to migratory or wintering birds and small mammals. The comments are accompanied by numerous scientific references. There is a concern that the proposal fails to recognize the importance of juniper woodlands for some species. It is asserted that juniper woodlands support a diverse wildlife fauna that is sometimes restricted to that habitat and won't occur in sagebrush steppe. These species include the gray flycatcher, Cassin's Vireo, juniper titmouse, western scrub jay, rock wren, and several raptor species. Some of the uses cited in the comments include nesting and roosting cavities for birds, shelter for bats and small mammals, and hunting areas for larger species. Several comments request that the proposal retain stringers and clumps of smaller and younger junipers for wildlife habitat. These areas would provide songbird and small animal habitat.

According to these comments, junipers also provide an important winter food source, particularly during harsh winters for wintering birds and several small mammals. Juniper berries are consumed in winter and juniper foliage is consumed by several small mammals and may be an important food source in harsh winters. Migrating cedar waxwings are known to forage heavily on juniper berries in high elevation juniper-aspen plant communities in early fall. It is requested that the EIS identify particular groups of birds that utilize juniper berries during seasonal migrations and provide analysis of impacts.

The statement is made that the area is popular with birdwatchers and that songbirds are of particular interest. It is requested that information be included on songbirds in the analysis of special status animal populations. It is also asked that the project follow the spirit of Executive Order 13186, which directs agencies to incorporate migratory bird conservation into agency planning processes whenever possible. It is noted that the BLM and USFWS have not yet signed a Memorandum of Understanding (MOU) on this direction.

One comment acknowledges the limited resources available to specifically evaluate bird species. It is suggested that given these limitations, a "guild approach" (grassland, shrubland, woodland) be taken in the EIS to analyze songbirds. It is suggested that special attention be given to Brewer's Sparrow and Juniper titmouse. The comment includes several publications that could be used as a resource for evaluation.

One commentor is concerned that many bird populations show declining trends and that this is indicative of poor riparian habitat condition.

2.5.2 Sagebrush Obligate Species

The Purpose and Need cites "severely diminished habitat values, particularly for sagebrush obligate species," which generated several specific comments. Some commentors requested that the EIS specifically address how the proposal would aid specific sage grouse populations. They stated that the treatments should be focused on areas where there will be the most effect on populations. Another comment is that although juniper encroachment appears to negatively

impact sage grouse, their populations fluctuate and dynamics are poorly understood. Improved habitat quality may not mean immediately improved populations. There is also a question in the comments as to the effect of fire on sage grouse. One commentor states that fire will probably help sage grouse but that it is not a direct relationship. Another states that there is no indication that restoration of fire will improve sage grouse populations.

Several comments state that mitigation measures must be clearly outlined to ensure that the impact of other threats to the sagebrush biome are not worsened by juniper removal. Additionally it is asserted that agencies must cooperate across boundaries, using consistent methodology for evaluation of populations and habitats to insure a common means to monitor and evaluate the project's effects

There is strong scientific support for application of grazing use standards that provide for 7-9 inches of residual stubble height left uneaten on native grasses. Current livestock utilization levels will not provide for necessary residual stubble heights and cover for sage grouse nesting. This effect would be exacerbated during drought.

One comment states that the Forest Service, BLM, NDOW, and CDFG have been committed to sage grouse conservation planning for several years and have agreed to follow specific guidelines. It is recommended that these guidelines be specifically implemented as part of the plan. There is also a comment that the strong evidence for grazing standards that provide for 7-9 inches of residual stubble height for sage grouse nesting, which would likely require modification of grazing practices.

Finally, it is recommended that any treatments within 6 kilometers of sage grouse strutting grounds should be limited to hand treatments only, consistent with WAFWA guidelines, which should only affect about 20 sites in the project area. If hand treatments are not feasible, there should be no treatment in these areas.

2.5.3 Cumulative Effects Analysis

Commentors request documenting and disclosing the direct, indirect and cumulative effects on wildlife of juniper treatments across federal and private lands. One comment states that the EIS must disclose the impacts of the project on the viability of species associated with juniper woodlands. Another comment states that the following must be included in the analysis of cumulative effects; wells and windmills, pipelines, troughs, roads, salting sites, weed infestations, powerlines, fences, aquifer depletion, cheatgrass, altered fire cycles, altered understory species composition and structure, altered overstory species structure, existing vegetation treatments, grazing disturbance conflicts with nesting birthing, wintering, etc., livestock structural alteration of shrubs, energy project siting, mining, OHV use, and unregulated motor use.

2.5.4 Mature habitats and fragmentation

Some concern was expressed that, in the interest of restoration, acknowledgement of the importance of older juniper stands as important habitat will be lost. The importance of mature or old-growth juniper to cavity nesting birds, neotropical migratory birds and other species must be discussed and protective measures taken to avoid impacts to old growth dependent species.

Fragmentation of these habitats is also brought forward as a concern. A mosaic approach to landscape management may result in fragmentation of important habitats, particularly those that are dependent on intact or mature habitat.

2.5.5 Sensitive Species

Commentors state that the EIS must disclose the results of surveying for Sensitive, Species at Risk, and Management Indicator Species (MIS) that is required annually under the Modoc Forest Plan. It is also stated that the effects to wildlife habitat must be assessed in quantitative and qualitative terms and that data references provided as to various habitat types for each species. Also included should be discussions of the amount of habitat for various life cycles, and how habitat has been and will be affected (cumulative effects). Population trends should also be disclosed. It is emphasized that the agencies must use the appropriate species lists and that numerous surveys be conducted during various times of the year and across the landscape to determine baseline conditions

During implementation of treatments, it is requested that the EIS stipulate full avoidance of treatments during sensitive periods for sensitive species such as during for nesting, birthing, or wintering activities.

2.6 Hydrology and Soils

2.6.1 Hydrologic Function

Several commentors expressed concerns regarding the project and hydrologic function. Some disputed that juniper removal alters water yield. Some comments indicate concern that the deforestation proposed by this project could profoundly alter or harm the hydrologic function of affected watersheds. The overall health of the watershed is critical in limiting sediment, water yields, and preservation of springs and riparian areas. It is stressed that disturbances must be assessed on an appropriate level and across watersheds. It is requested that there is considerable collection of baseline data to monitor hydrologic changes. Specific concerns are also raised including the post-treatment loss of shaded ground and how that affects hydrologic conditions. Another comment is that the predominant form of precipitation is snow accumulation and melt and there is a lack of research as to the effects of western juniper on these dynamics.

The comments request a complete and thorough analysis of the cumulative effects of livestock grazing, past, present and future, and treatments of riparian areas, erosion, water quality, etc. It is also requested that the analysis include detailed descriptions of past projects, as well as commitments and funding agreements made in connection with these actions.

The potential for a biomass plant in the area is also addressed. The question is raised about the quantity of water consumption for a biomass plant and how that compares to anticipated changes from the management proposals.

2.6.2 Erosion

Erosion is a concern both for water quality and for a potential loss of topsoil and site productivity. Comments indicate a concern that ecological processes such as erosion on the

Modoc Plateau have already been fundamentally altered due to grazing and other disturbances. It is recommended that for all sites considered for treatment, a determination be made as to how much topsoil has eroded and whether the site conditions have become so rocky as to have been converted to a juniper site. This would prevent treatments in areas that no longer exhibit the site conditions preferred by sagebrush.

Before a decision is made to treat an area, the comments stress that the EIS must first assess the susceptibility/vulnerability of watersheds to erosion following a fire-induced disturbance. There is also concern about the use of yarding machines, ground based skidding, and the use of heavy equipment which could further erode existing soils.

2.6.3 Water Quality

There were few comments about water quality other than those discussed under erosion. One comment requests that current water quality data be provided for all seeps, springs, and streams in the watersheds that will be affected. This information should be collected during the time when livestock are present. Another request is for the EIS to detail the number of 303d listed streams as well as TMDLs in various stages of development, finalization or implementation that exist in the project area.

2.6.4 Soil Nutrients

Nutrient cycling is brought up by many commentors under various subjects including the causes of juniper expansion discussed under the purpose and need. It is a general sense in the comments that nutrient cycling has been altered or interrupted due to destruction of cryptobiotic soils, reduction in herbaceous vegetation and changes in the fire regime. There is a concern that removal of juniper will cause a collapse of the ecosystem in some areas because the majority of the nutrients are tied up in that biomass, and there would be a catastrophic loss of nitrogen and carbon from the system. It is asserted that because the cryptobiotic soils have been destroyed, there remain few nitrogen fixing organisms to bring nitrogen back into the soils. Soil carbon has been seriously reduced due to a reduction in soil litter available for decomposition. To correct these problems, it is suggested that juniper woodlands in these conditions be rested for a number of years before treatment is attempted to allow regrowth of an understory. These species would take up nitrates and other nutrients that would otherwise be lost once the juniper are removed. In areas where density is too high for the development of a vigorous undergrowth, a staged removal could be accomplished.

It is also suggested that juniper keep the salt in the soils in check. Once this ecology is disturbed, the salt could surface and eventually kill plant life in the area. The point is made that salinization destroys huge areas every year.

The commentors would like to see the inclusion of recommendations on ways to restore cryptobiotic crusts and encourage the cycling of nutrients back into the soil. The restoration of soil health, combined with reintroduction of fire, is key to the sustainability of these forests. These commentors also see soil loss through erosion as a loss of nutrients as well as topsoil. Juniper removal must be accomplished in such a way as to prevent large-scale disturbances such

as may occur with chaining, cabling, dragging of trees, compaction from vehicles or dragging boles on the ground.

2.6.5 Riparian, springs and other wet areas

Some comments express a concern about the effects of the proposal on riparian areas, springs, and other wet areas. There is a request for a detailed survey to identify and characterize all spring sites and assess each one's ecological condition and the effect of management and livestock use on the site. The concern is that the deforestation of juniper will further alter fragile springs due to heavy biomassing, compaction of soils and possible desertification. It is also requested that the EIS include a study of riparian vegetation and habitats it provides and potential effects to these areas.

The comments recommend that, as part of restoration, all alternatives include actions to repair and improve damaged or diverted riparian areas. It is also requested that the restoration potential of springs, ephemeral and intermittent drainages be assessed and plans be developed to restore these sites. Past failed riparian management actions must be reviewed to prevent future damage.

Finally, it is stated that there needs to be detailed studies that describe, define and quantify aquifer and ground water sources and any changes or depletions that may be occurring or have occurred or are foreseeable from management actions.

2.6.6 Monitoring and surveys

The comments request that regular, rigorous and long-term monitoring be part of any plan presented in the EIS. They suggest that this plan should include parameters to measure water quality, flow rates, aerial extent of wetted area, plant species composition, trampling, etc. According to one commentor, it is important that the surveys are conducted over multiple years and include periods when livestock have been present for a significant amount of time for comparison with any studies in livestock-free periods.

2.7 Fire

There are conflicting comments about the degree to which fire should be used as the dominant treatment for juniper removal. One viewpoint is that the plan expects too much from prescribed burning and underestimates the capability of mechanical harvesting to economically remove juniper with minimal environmental impact. This commentor believes that prescribed fire is often ineffective at achieving goals and given the types of conditions that would be needed to carry a fire in this ecosystem (hot and windy) would require a large amount of staffing.

The other viewpoint is that the claim that certain areas cannot carry a fire are incorrect. This viewpoint sees prescribed fire as a way to restore the landscape in a way that provides a needed and missing disturbance regime back to the landscape. Fire provides opportunities to reproduce patchiness and variability across the landscape. This view points to mechanical methods of juniper removal as destructive, aesthetically displeasing and less effective without providing the ecological benefits of fire.

There is caution in the comments about the ability of some of the areas to carry a fire and whether especially the larger juniper would be able to ignite in areas with little ground fuels. The point is also made the grazing causes lower limb removal on juniper that protects the juniper from ignition during ground fires. Several comments suggest resting areas scheduled for treatment from grazing for several seasons prior to burning. This would allow growth of underbrush, increasing surface fuels and making the likelihood of success much greater. It is also suggested that if ground cover is still inadequate to carry a ground fire that will ignite the larger trees, that trees should be individually torched.

The comments do include some caution regarding fire and the sagebrush ecosystem. It is stated that burning almost always kills all sagebrush so it is critical to manage the burning so that a local seed source is preserved, or have plans for manual seeding following the burn. There is some concern regarding an increase of the frequency of fire in the sagebrush steppe ecosystem and the effect on shrub species. It is requested that the EIS provide more details of how the burning will be accomplished and what the dynamics of the sagebrush ecosystem are and how they will be emulated.

It is also stated that the EIS must assess the risk that increased fire may accompany all of the treatments that are proposed. It is also a concern that restoration of fire to the landscape not create a homogenized landscape by imposing an even fire return interval on all areas. A different viewpoint is that creating a mosaic of fire intensities and extent across the landscape may reduce the effectiveness of juniper removal. Again, clarification in the EIS as to how the plan would work is requested.

2.8 Air Quality

The assumed likelihood of the establishment of a biomass plant brought several comments regarding air quality. It is stated that the EIS must disclose the impacts of burning this biomass material to air quality. It is requested that the air quality impacts from the prescribed burning in combination with a biomass plant be evaluated on a regional basis and that the impacts on property values in the region be evaluated. One comment is opposed to any prescribed burning due to concerns for public health.

A few comments request an evaluation of the net carbon dioxide balance due to juniper removal and the biomass plant.

2.9 Cultural Resources

The cultural resources comments present a general opposition to the project because of an assumed policy of eradication of the piñon-juniper plant community, which are important plants to regional tribes, for 150 years. Both juniper and piñon pine are very important culturally to the Paiute, Washoe, Shoshone, Pit River, and Maidu Tribes. The comment is made that juniper was systematically eradicated from its historical range beginning about 1860. Sagebrush was also eliminated later with herbicides. NEPA requires the EIS to fully analyze the impacts on plants

that are of importance to Native American culture. Juniper is also frequently successional to piñon pine. Destruction of juniper may truncate natural successional processes and have long-term adverse impacts on Native American cultural practices and subsistence gathering of traditional foods. The cumulative impacts to Native American cultures and ecosystems must include the historical disturbances.

The comments state that the inventory and monitoring of Native American culturally important plants is required by the recent forest plan revision (Sierra Nevada Forest Plan Amendment). The EIS, it is asserted, must also consider that tribal people will be disproportionately affected by the proposal due to their traditional uses of these plants. The EIS must show how the proposal complies with requirements of Executive Order 12898, Environmental justice, and display monitoring data to evaluate the loss of Native resources from the systematic destruction of juniper-piñon woodlands over the last 150 years.

The comments also assert that the Forest Service must engage in government-to-government consultation with affected tribes and must respond in a meaningful way to the concerns of tribal people, adjusting the proposal appropriately. The FS is required under NEPA, NFMA, AIRFA, ARPA, NAGPRA, NHPA, RFRA and Executive Order 13084 and 13007 to consult with tribes and other interested traditional practitioners and Cultural Leaders. The Sierra Framework also directs the Forest Service to give high priority status to consultation with affected tribes in conjunction with inventory and monitoring of traditional plant resources.

2.10 Economics

2.10.1 Biomass

The comments on biomass reveal public concerns about the presumptive use of the removed juniper to fire a biomass power plant in the area. One concern is that the pressure to sustain a new industry and produce power could drive an ecologically unsound level of vegetation removal or result in decisions about the use of prescribed fire that are not best for the ecosystem. In order to support this use, the EIS needs to show that this is a cautious, ecologically suitable, scientifically sound utilization of woody biomass.

There is a concern that in general economic interests, particularly grazing and biomass, could trump sound scientific and resource management judgments, resulting in a less than ideal outcome. If the juniper is to be used as an economic resource, then due diligence should be used to insure that this does not happen. The comment is also made that there are many other ways to generate electricity other than burning biomass.

Another concern is the reliance that local populations may develop on the biomass plant as a source of jobs. The agencies have a responsibility to insure that local industries do not develop that are dependent on the juniper resource which could collapse local economies in 20 to 30 years when the supply of juniper runs out, or when energy policies change. It is important that commercial uses of juniper not expand to unsustainable levels of industrial use. There are many questions that commentors would like answered in the EIS, including:

Which biomass plants would use the junipers?

If a plant is built in Alturas, how much of the juniper from the 40,000 acres treated each year will be consumed?

Who will pay cost of getting juniper to the power plant?

What if the energy policies of the government changes and biomass power plants go out of favor or a local plant is not built?

It is suggested that the EIS should analyze the tradeoffs between the increase in energy prices, which will increase demand for biomass power, and the increased cost of mechanical harvesting and trucking the biomass to the plants.

Another viewpoint is that although the reintroduction of fire is important to the ecosystem, initial treatments should be by mechanical means with juniper removal required. The juniper can be chipped and used to make electricity. The point is made that burning the juniper under controlled power plant conditions is 97 percent cleaner than open burning. Requiring mechanical removal will bring badly needed jobs to the area.

One commentor stated that mechanical harvesting of juniper biomass, properly completed, is an effective means of land restoration and management. This commentor believes that the project may be an expensive failure if over-caution and low expectations define the program. There is disagreement that mechanical harvesting is uneconomic in juniper stands of less than 20 percent canopy cover, as stated in the Purpose and Need. The point is made that economics depend on many factors including location, slope, stem distribution, soil, presence of rock, and stand size. In addition, the cost of burning is often underestimated and its effectiveness overestimated. There is also disagreement that 30 percent slope should be a cutoff criterion for mechanical harvesting. Again, factors such as location, stand density, distribution, soil, presence of rock and tree size will influence the operating feasibility.

Commentors stated that the EIS must also provide a thorough economic analysis of the costs of the project. Information must be provided on the costs/success rate with or without grazing so that taxpayers can judge the worthiness of the project. There is concern that money will be spent only to result in accelerated soil erosion, weed invasion, habitat fragmentation, loss of viable species dependent on forested habitats.

2.11 Ecosystem Concepts

2.11.1 Biodiversity and ecosystem approach to land management

Land restoration implies an approach to management that addresses the ecosystem as an integrated and complex system with many factors contributing to its overall health. These comments respond to that impression. Many comments bring up the need to consider the complexities of the system and include the interrelationships between soils, aspect, and site conditions in determining the natural inherent biodiversity of vegetation. The comments reflect a desire to see as part of the process, the identification of the important habitat components that

determine natural diversity on the lands and then design management actions to enhance and restore these habitats and populations.

There is concern about the accuracy of current agency information on ecological conditions, status, and range survey methodology for determining plant community types. There is concern that there may be an overall lack of systematic ecological assessment of the health of native plant communities across the landscape. This leads to many requests for detailed and extensive surveys across the area. One example is a request that the EIS should assess the full range and diversity of native plant communities that exist across the landscape. The conditions of these communities should be assessed including factors such as soil stability, erosion, presence of microbiotic crusts, loss of soil horizons, susceptibility to wind and water erosion, and ecological integrity.

One commentor asks that the agencies conduct a full inventory and assessment of all existing livestock facilities and developments on the allotments, all water haul and salting sites, and all vegetation treatments that have been conducted. The full range of cumulative effects must be analyzed. This is necessary to understand possible causal factors in vegetation degradation that this EIS is attempting to treat.

It is also stated that the EIS must address what elements of the historic biodiversity have been lost or altered and where these effects occur. The question is, what factors have contributed to loss of native biodiversity, what management strategies have been taken to mitigate them, and have these measures have been effective?

There is some concern that across the landscape, use of biomass, burning, logging, and other proposed treatments will have many of the same effects as grazing. The result could be the creation of hotter, harsher, drier sites, eliminating or reducing ground litter and exposing soils to wind and water erosion. Should there be continued grazing disturbance and invasion of noxious weeds, native plant communities could cross thresholds from which recovery is very difficult if not impossible.

In general, the comments support the use of an ecosystem approach to land management. One commentor expresses concern about the existing impacts that have developed over time due to altered fire frequencies, combined with ubiquitous grazing, invasion of exotic species and fragmentation on populations of mammals and birds. However, the comments also caution that juniper treatments should only be considered a first step to restoring the ecosystem. It is stated that the benefits will be short-lived if fire continues to be excluded from the landscape and livestock utilization increases or is not properly addressed.

2.11.2 Mechanics of Restoration

Many of the commentors would like to see methods of restoration that support the concept of landscape restoration. There is some concern as to the amount and types of mechanical treatments that are proposed. Treatments that utilize "chaining" for juniper removal may be effective but this method is damaging to other steppe community species and can be less beneficial. If "chaining" is contemplated, commentors request that other methods be considered in the EIS.

In keeping with the ecosystem and land restoration concept, it is suggested that alternatives should include a wide range of passive restoration techniques such as closure of unnecessary roads and constraints on livestock use. This comment suggests that uses should not be shifted or extended into currently less-utilized lands under any treatments as these areas are refugia for native species and many of which are undergoing fragmentation. It is also suggested that the EIS should establish an ecologically based fire restoration program so that fire can play its natural role in the sagebrush steppe ecosystem.

The priority of treatments should be in those areas with the highest productivity and lowest risk, such as those areas with good soils receiving over 14-16" of annual precipitation.

It is recommended that the EIS produce a list of management practices that will maintain and restore the ecological balance of the sagebrush steppe ecosystem. This should be aimed at preventing subsequent juniper expansion from reclaiming previously treated sites in a few decades. For example, it may be necessary to rest a site from grazing for a specified period after a fire.

In keeping with landscape restoration, it is suggested that the EIS prohibit new road building as a means to accomplish juniper treatments because new roads pose a risk of introducing noxious weeds, off road vehicles and other management problems.

2.12 NEPA

2.12.1 Project Scope

It is suggested that the 30-year project duration is unreasonable and fails to recognize NEPA's intent to base the EIS process upon accurate scientific analysis, existing conditions, and public scrutiny. The comment indicates an expectation that an EIS would need to be revised or redone when significant new circumstances or information occurs, or every 3-5 years for on-going plans and projects. How this project fits with this direction is questioned.

2.12.2 Baseline and effects assessments

Many of these comments set out expectations for the type of analysis that should be conducted by the EIS. Comments suggest that agencies must provide current and basic information about the soils, watersheds, native vegetation, wildlife habitats and populations, recreational uses, and other important values. This information should include current baseline information on ecological condition and seral status of all vegetation communities must be examined. It is also asserted that site-specific inventories for the full spectrum of special status species must be collected as part of the EIS efforts.

It is also assumed that agencies must examine all historic disturbances (human or natural) and determine how these disturbances have affected the current ecological conditions on the site. When examining past actions it is asserted that agencies must assess the health of past actions or occurrences before undertaking new treatments. It is requested that the EIS include an inventory and assessment of all historic disturbances before a range of alternatives is developed. Commentors would like to see maps in the EIS that show the extent of past vegetative treatments

over the entire area and an assessment of their ecological condition. It is a belief that this is essential information for alternative development.

Once baseline conditions are established, commentors expect that the EIS will thoroughly examine the negative effects of the proposed actions and fully discuss and disclose the impacts to wildlife, vegetation, soils, hydrology and weed invasions and other resources of value.

2.12.3 Range of Alternatives

Comments emphasize the need for the EIS to develop a wide range of alternatives for treatment that address all the important values and the large number of environmental effects. It is emphasized that the best available science must be used for all alternatives. According to the comment, this complies with NEPA, helps the agencies make better decisions, and provides the public with realistic expectations for the restoration project.

One comment is that it is important not to structure the alternative development process around the needs of livestock or the maximization of juniper removal. Instead agencies should develop suitable alternatives that address the array of important values on these public lands. Key components of Land Use Plans should be incorporated to protect and sustain vegetation communities. Agencies should not sacrifice western juniper or other species for sagebrush species needs. It is also requested that there be consideration in the alternatives of many passive restoration techniques such as no new roads to achieve treatment.

Another comment states that the range of alternatives must include those that do not expand livestock facilities or associated activities. These activities and increased livestock use associated with them will result in depletion of native vegetation, loss of macrobiotic crusts, weed invasions, and fragmentation and are not compatible with the project's goals for landscape restoration.

2.13 Special Management Areas

There are several special management areas in the project area, including wilderness areas, Forest Service inventoried roadless areas, and BLM roadless areas. There are specific requests in the comments as to how these areas should be managed during treatment.

It is requested that adjacent to special areas, the EIS should mandate the use of fire as the primary juniper control tool while concentrating mechanized activities around homes, private property and major roads.

In areas where there exists an array of overlapping values, or unique values that are important to protect, agencies should consider designating large areas of sagebrush vegetation needed for these values as an ACECs or RNAs, in order to better ensure sustainability of special populations.

2.13.1 Wilderness Areas

In the South Warner Wilderness Area, a commentor notes that it appears that "forest management treatment" is a possibility. This usually means logging which the Wilderness Act prohibits. In this wilderness area, the comments encourage the Forest Service to use prescribed fire rather than hand treatments citing that fire is a natural process and more likely to be justified under a minimum tool analysis and may only require the use of a Categorical Exclusion (CE).

However, since vegetation management with handtools or chainsaws is allowed in designated wilderness areas under certain circumstances, so long as wilderness values are enhanced, there may be alternatives to fire under certain unusual circumstances. This would require a minimum tool analysis and at the least, an Environmental Assessment (EA).

2.13.2 BLM Roadless Areas

It is stated that the BLM has not completed its own survey of areas with wilderness characteristics in Northeast California. However, the October 29, 2003 RMP scoping letter requests that the BLM survey for and agree to protect the following areas with Wilderness characteristics: Observation Peak RA, Shaffer Mountain RA, Shinn Mountain RA, Skedaddle Flats RA, Skedaddle West RA, and Snowstorm RA. It is indicated that mechanical or hand treatments may be accomplished in these areas. Shinn Mountain, Observation Peak, and Snowstorm Mountain are quite steep and unsuitable for heavy equipment with the exception of cherry-stemmed routes, which could facilitate minimum impact roadside cutting with chainsaws. It is requested that only fire and chainsaws along existing cherry stems be allowed in these areas.

2.13.3 Forest Service Inventoried Roadless Areas

In these areas it is suggested that the Forest Service mimic natural processes to the maximum extent possible through the use of prescribed fire. Specific suggestions for each roadless area are described below.

Steele Swamp Roadless Area

Forest Service provided information indicates that portions of this Roadless Area are proposed for "Priority mechanical treatment areas" and "isolated mechanical treatment." These methods raise the possibility of new road construction. A substantial portion of this roadless area is to be managed as a Semi-primitive non-motorized (SPNM) recreation opportunity. Timber cutting can occur in SPNM only if it is intended to remove trees killed by "fire, insects and disease." This is not the case here.

If mechanized juniper removal (not including people on foot with chainsaws) is proposed in this area, with or without new road construction, it is believed that an EIS would be required. This RA is over 5,000 acres in size and remains primarily primitive. Thus it qualifies for future consideration as wilderness. The courts have affirmed "the possibility of future wilderness classification triggers, at the very least, an obligation on the part of the agency to disclose the fact that development will affect a 5,000 acre Roadless Area." Also the Forest Service Handbook (FSH) states that if a "substantial alteration" of a Roadless Area's primitive character is proposed, an EIS must be prepared and the impact of the proposed action on the Roadless Area must be considered. This direction recognizes the ecological importance of these areas and controversial nature of development in them. By contrast, a prescribed fire in this area may only require a CE and would have the support of many conservation groups.

Roadless Areas: Big Canyon, Mount Vida, Mount Bidwell, Crane Mountain RA, Powley, Soldier, Dry, Parsnip, Bear Camp Flat

It is requested that prescribed fire be used in these roadless areas rather than priority mechanical treatment, sensitive hand treatment or forest management treatment for the same reasons as outlined for Steele Swamp Roadless Area (further mapping details in commentors letter).

Roadless Areas: Knox Mountain, Hat Mountain, Sears Flat, Damon Butte

For these partially roaded and logged Roadless Areas, it is requested that no new roads be built in the remaining roadless portions of these areas.

2.13.4 Uninventoried Roadless Areas

There are 12 areas zoned by the Modoc National Forest's Land and Resource Management Plan (LRMP) as SPNM that are either stand-alone new Roadless Areas or additions to RARE II areas. It is requested that fire be the primary juniper control method used given that timber management is precluded in SPNM areas by the LRMP.

2.13.5 BLM Wilderness Study Areas – Tule Mountain and Pit River

These two BLM wilderness study areas (WSA) may be slated for hand treatment and priority mechanical treatment. Pit River WSA is also zoned for forest management treatment. It is suggested that these areas must be managed according to FLPMA's non-impairment standard, which provides a minimum level of protection. It is requested the BLM use fire in these areas to most closely mimic natural processes and enhance wilderness values. An advantage to the process is that a prescribed fire can be accomplished with a CE rather than an EA or EIS.