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Agriculture

Forest  
Service

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# Draft Environmental Assessment

## Tucker Grazing Allotment

Pacific Southwest Region  
Modoc National Forest, Doublehead Ranger District  
Modoc County, California



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# Table of Contents

<b>Introduction</b> .....	1
Background .....	1
Purpose and Need .....	3
Desired Conditions.....	3
Proposed Action .....	4
Decision Framework .....	4
Tribal Consultation .....	4
Public Involvement .....	4
<b>Alternatives, Including the Proposed Action</b> .....	5
Alternatives .....	5
Alternatives Considered but Eliminated from Detailed Study .....	12
Comparison of Alternatives .....	12
Monitoring .....	16
<b>Environmental Consequences</b> .....	18
Vegetation and Rangeland Resources .....	18
Soils and Hydrology .....	22
Heritage Resources .....	24
Botany .....	25
Noxious Weeds .....	26
Terrestrial Wildlife .....	27
Management Indicator Species .....	30
Aquatics .....	30
Socio-Economic Factors .....	45
Short-Term Uses and Long-Term Productivity .....	46
Irreversible and Irrecoverable Commitment of Resources .....	47
<b>Consultation and Coordination</b> .....	47
<b>References</b> .....	49



## Introduction

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The Forest Service has prepared this Environmental Assessment in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This Environmental Assessment discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives.

Additional documentation, including more detailed analyses of project-area resources, may be found in the project planning record located at the Doublehead Ranger District Office in Tulelake, Modoc County, California.

## Background

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The Tucker Allotment has 28,272 acres of suitable grazing, 899 acres administered by US Fish and Wildlife Service, and 40 acres of California State land within its boundary. The allotment is just south of Clear Lake National Wildlife Refuge and east of Highway 139 in Modoc County (Figure 1).

Livestock grazing has been a historic use in the area since 1873. Prior to 1900 livestock numbers and the season of use was unmanaged but some reduction in livestock numbers had begun. Historic accounts indicate that 75,000 to 80,000 cattle and horses ran between Mt. Dome and Goose Lake, and as far south as Quaking Aspen near Mud Lake until 1920 (Figure 1). After 1900, bands of sheep were brought into the area from Oregon and the Sacramento Valley to winter and remained to lamb on the range in the spring. It has been estimated that up to 100,000 sheep came in between 1917 and 1920, using the area between Mt. Dome and Doublehead Mountain. In the 1950s and 1960s, livestock numbers were greatly reduced and management of grazing permits was established. There has been a steady decline in livestock numbers since the 1950s.

A decline in the fire frequency following European settlement has resulted in the increased dominance of shrubs and trees and a decrease in perennial forbs and grasses (Crawford et al. 2004). Across the sage steppe ecosystem, Mountain big sagebrush cover has increased from less than 20%, to 30% and 40% in sagebrush grasslands (Winward 1991 as cited in Miller et al. 1994). The overall trend on a large portion of the sagebrush steppe has been a reduction in palatable grasses and forbs and an increase in sagebrush species (Ellison 1960, Young et al. 1976 as cited in Miller et al. 1994), and Western juniper.

Over the past seven years the following grazing activity has occurred:

Table 1. Head Months for cattle and sheep on Tucker Allotment.		
Year	HMs - Cattle	HMs - Sheep
2008	1509	None
2007	1509	3025
2006	1509	3025
2005	1588	2571
2004	1509	3025
2003	1509	2268
2002	1509	3025

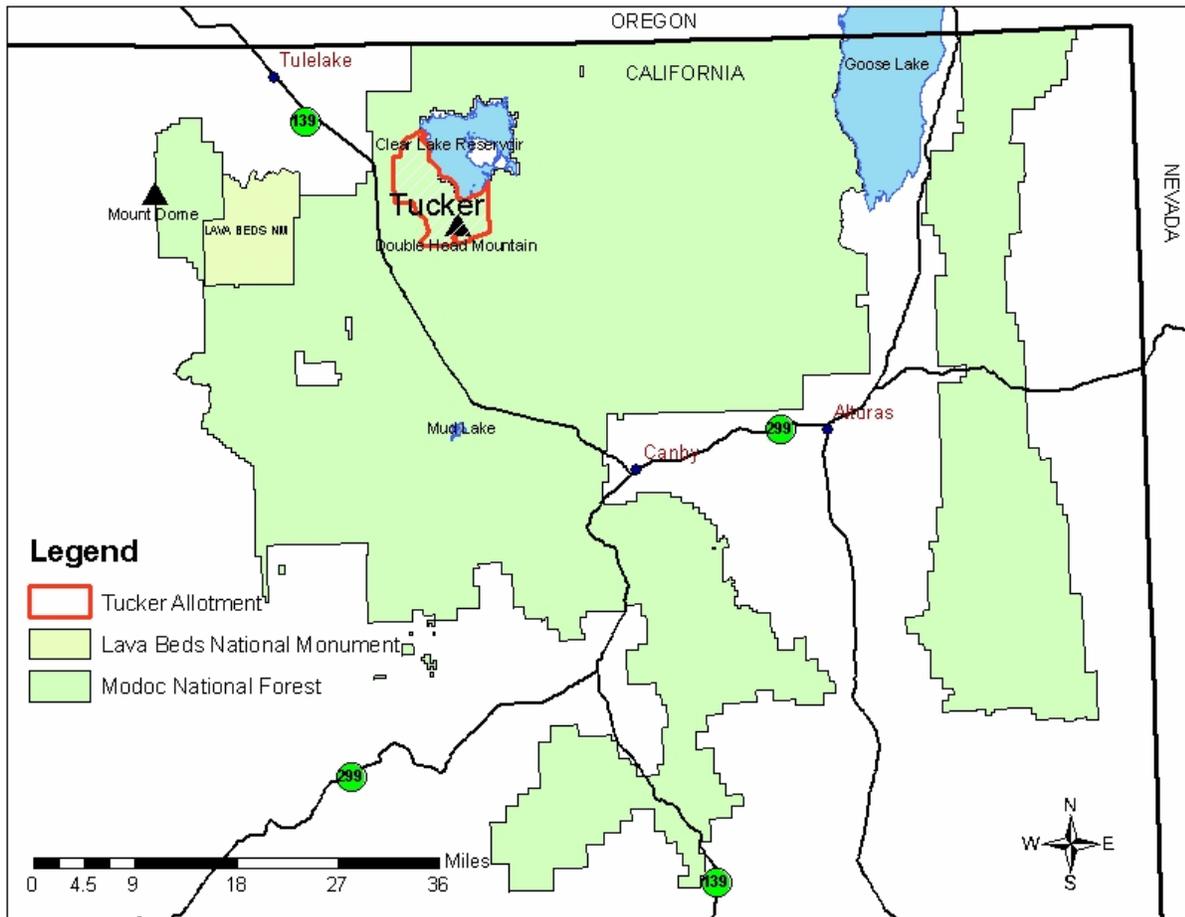


Figure 1. Location of Tucker Allotment

## Purpose and Need for Action

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Section 504(a) of the 1995 Rescissions Act, Public Law 104-19, as amended, requires updated environmental analyses of all allotments across the Modoc National Forest by December 31, 2010. The Rescissions Act addresses grazing on National Forest System lands, specifically allotment analysis, grazing permit issuance and compliance with NEPA.

It is Forest Service policy to contribute to the economic and social well being of people by providing opportunities for economic diversity and by promoting stability for communities that depend on range resources for their livelihood (Forest Service Manual [FSM] 2202.1). The Modoc National Forest has determined that lands within the Tucker Allotment are suitable for producing forage for grazing.

The permittees grazing livestock on this allotment have a need to implement a grazing program that is economical and sustainable. The Forest Service has a need to meet multiple-use objectives while ensuring that healthy rangeland conditions are achieved, as directed under the Modoc National Forest Land and Resource Management Plan (LRMP, 2001) as amended by the Sierra Nevada Forest Plan Amendment (SNFPA 2004).

## Desired Conditions

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Review of existing conditions within the allotment indicates that desired conditions are being met related to current livestock grazing for the following resources: Watershed, soils, recreation, range, and visual quality. Long term range monitoring data indicates that overall rangeland conditions within the allotment are healthy and in satisfactory ecological condition except in some areas dominated by Western juniper. Between 2005 and 2007 a total of 138 plant species (ten shrub species, 109 forb species, 15 grass species, two species of sedge, and two tree species) were identified on the Tucker Allotment. Based on this information the allotment is considered to be in a mid- to late seral stage. Thirteen of the genera present on the allotment, some represented by multiple species, have been documented to be present in the diets of sage-grouse. Based on information located in the project record, sage-grouse prefer forbs that are listed in each of the three seral stages. Continued monitoring, yearly meetings with the grazing permittees and developing an Allotment Management Plan (AMP), which directs livestock use for the next ten years, will ensure that the Tucker Allotment continues to move toward the desired condition and that it is maintained.

The primary emphasis is to manage rangeland vegetation, provide for healthy ecosystems, and make forage available for use by livestock, wildlife, and wild horse herds. The vegetation management goal is to provide desired expressions of herbaceous, shrub and forest vegetation according to site potential and resource needs. Resource uses occur to the extent that they do not adversely affect maintenance of the desired vegetation expression (LRMP, pg 4-99). The standards and guidelines pertaining to grazing in the Modoc LRMP are as follows: Manage grazing to maintain desired vegetation expressions and satisfactory ecological condition (LRMP 4-100). Within an eighth-of-a-mile radius around each sage-grouse lek, rejuvenation projects will not reduce big sagebrush to <20% canopy cover. When present, sagebrush will be retained up to 100 yards from the edge of riparian areas, meadows, seeps and springs (LRMP, pg 4-102). Maintain or improve forage conditions with an

emphasis on increasing the variety of vigorous plants available for forage and on providing a mixture of shrub age classes (LRMP, pg 4-102).

## **Proposed Action**

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The Forest is proposing to authorize continued cattle grazing on the Tucker Allotment, while discontinuing sheep use. The proposal is to allow 300 cow/calf pairs on the allotment for 5 months of the year, from approximately May 1 to September 30 each year. Cattle would graze the five pastures of the allotment using a deferred rotation system, which is the same as current management. Discontinuing domestic sheep grazing would reduce potential impacts on sage-grouse nesting and brood rearing habitat. A full description of the Proposed Action is covered under “Alternatives, Including the Proposed Action”.

## **Decision Framework**

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Given the purpose and need, the deciding official, Laurence Crabtree, Doublehead District Ranger will review the proposed action, other alternatives, project record and other pertinent information in order to make the following decision:

Whether to authorize livestock grazing on the Tucker Allotment as proposed, to implement one of the alternatives, to modify the proposal, or to adopt the no action alternative.

## **Tribal Consultation**

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Modoc personnel attended several Native American Consultation meetings dealing with the Tucker Allotment. The first occurred on May 3, 2006 to explain the need to conduct an analysis to bring the allotment into compliance with the 1995 Reversions Act. On June 13, 2007 Forest Service personnel had a field trip with a member of the Klamath Tribal Council regarding fencing the remaining open shore of Clear Lake.

## **Public Involvement**

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The Tucker project was listed in the Forest Service’s Schedule of Proposed Actions in October 2005, January 2006, March 2006, June 2006, October 2006, March 2007, June 2007, October 2007, January 2008, March 2008, and in June 2008. Letters were mailed to adjacent permittees, the Klamath and Pit River Tribes and other interested parties on May 16, 2006. On May 11, 2006, and again on December 15, 2006 Forest Service personnel attended meetings of the Modoc County Cattlemen’s Association. In response to scoping, we received a comment from an individual in Bend, Oregon concerning monitoring and available funding to allow the Forest Service to conduct studies in a timely manner, and his overall support of livestock grazing. In July 2007 an individual emailed the Forest asking to be included on the Tucker Allotment scoping mailing list, to which the District responded by adding the person to the mailing list. On February 7, 2008 the Doublehead Ranger District had a meeting on sage-grouse and the need to move sheep to another area. Representatives from the California Department of Fish and Game, the Alturas Office of the Bureau of Land Management (BLM), and the Natural Resources Conservation Service (NRCS) attended the meeting.

## **Alternatives, Including the Proposed Action**

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This chapter describes and compares the alternatives considered for the Tucker Allotment. This section also presents the alternatives in comparative form, defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public. Some of the information used to compare the alternatives is based upon the design of the alternative and some of the information is based upon the environmental, social and economic effects of implementing each alternative.

### **Alternatives**

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#### **Alternative I – No Action (No Grazing)**

The no action alternative for NEPA decisions on grazing authorizations has been defined as no grazing by the Forest Service (FSH 2209.13, Section 92.31). The no grazing alternative forms the baseline for the analysis of environmental effects.

This alternative does not implement the action proposed. For this project, No Action equals No Grazing, for the Tucker Allotment. Under this alternative, the term grazing permits would be cancelled. Cancellation of term permits must follow direction in Forest Service Manual (FSM) 2231.62d, Forest Service Handbook (FSH) 2209.13, Chapter 10 Section 16.24, and Part 2 item 11b of the term permit. Structures related to grazing, such as water troughs and fences, would be removed if and when feasible. Under this alternative, routine land stewardship would continue. These include: Threatened, Endangered and Sensitive species monitoring, fire suppression, road maintenance, or other administrative activities that address threats to life and property. This alternative complies with 40 CFR 1502.14(d), which requires that a no-action alternative be included in the analysis.

#### **Alternative II – Traditional (Past) Management**

Under this alternative, the Forest Service would authorize livestock grazing at the same number of livestock and length of grazing season as specified in the Tucker term permit (Table 2) for the Tucker Allotment. Under the permit, 300 cow/calf pairs are permitted to graze between May 1 and September 30 of each year, and 2000 ewe/lambs are permitted to graze from April 16<sup>th</sup> to May 31<sup>st</sup> of each year.

Allotment	Livestock			Period of Use		Head Months (HM)*	
	Permitted Numbers*		Kind	Class	From		To
	Cows	Sheep					
Tucker		2000	Sheep	Ewe/lamb	April 16	May 31	3,060
	300		Cattle	Cow/calf	May 1	Sept 30	1,530

\*Permitted Numbers are represented by cow/calf pairs (cc). A Head Month is the number of cow/calf pairs times the season of use, considering only one head for each cow/calf pair. A head month is defined as one month's use and occupancy of the rangeland by one weaned or adult cow over six months of age (with or without calf), bull, steer, heifer, burro, mule, bison, ewe (with or without lambs), ram, or goat (Forest Service Handbook 2209.13).

The Tucker Allotment is located within the Doublehead Ranger District of the Modoc National Forest. It is divided into five pastures (Figure 2). The legal description for the allotment is as follows:

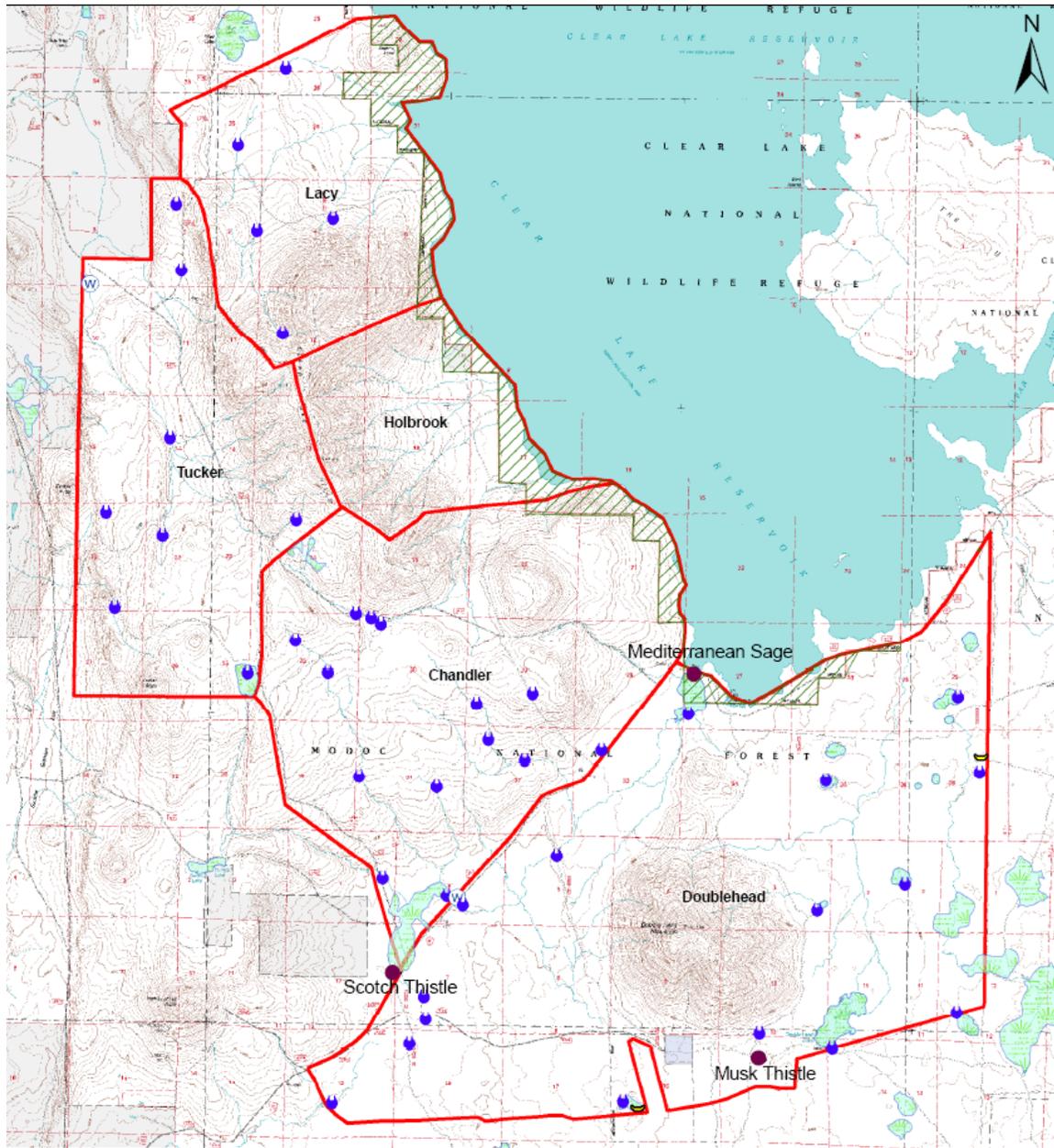
**Tucker** - T47N, R6E, Sections 25, 35 & 36; T47N, R7E, Section 31; T46N, R6E, Sections 1, 2, 10 - 15, 22 - 27 & 36; T46N, R7E, Sections 6 - 8, 17 - 21, 24 - 36; T45N, R7E, Sections 1 - 12, 14 - 18, and T45N, R6E, Section 13.

The allotment has 12 key areas for measurement of grazing utilization, and three utilization standards. The utilization standards are 50% for uplands, 40% for browse, and 35% for the shoreline of Clear Lake. The cattle are managed under a five pasture deferred rotation grazing system under which no single pasture is grazed first in the season any two years in a row. Utilization standards, by key area, are presented in Table 3.

Pastures	Location/Legal Description	Standard	
Lacy	Cattleguard K01/ T47N R6E Sec35	50	Herbaceous
	Goose K02/ T47N R7E Sec31	35	Riparian
Holbrook	Brush K03/ T46N R6E Sec13	50	Herbaceous
	Lake K04/ T46N R7E Sec17	35	Riparian
Tucker	Bitter K05/ T46N R6E Sec26	50	Herbaceous
		40	Browse
	Fayne K06/ T46N R6E Sec3	50	Herbaceous
		40	Browse
Chandler	Dike K07/ T46N R7E Sec21	35	Riparian
		40	Browse
	Ranch K08/ T46N R7E Sec30	50	Herbaceous
		40	Browse
Doublehead	Egg K09/ T46N R7E Sec26	50	Herbaceous
	Homestead K10/ T45N R7E Sec10	50	Herbaceous
		40	Browse
	Radar K11/ T45N R7E Sec17	50	Herbaceous
		40	Browse
	Wildhorse K12/ T46N R7E Sec33	50	Herbaceous

Traditionally, sheep use has started in the Tucker Pasture on April 16<sup>th</sup>. Starting May 1<sup>st</sup>, the permittee has moved his sheep to the Chandler Pasture. Around May 15<sup>th</sup>, the sheep are moved to the Doublehead pasture where they remain until May 31<sup>st</sup>. The predominant pattern of sheep use on the Tucker Allotment since 1996 is shown in Figure 3.

Based on information from the sheep permittee, Fernand Larranaga, the Tucker Pasture is the most important pasture for its forage value to sheep. Lambing on the allotment is limited.



**Legend**

- Pit Tank
- Water Troughs
- Well
- Noxious Weeds
- US Fish and Wildlife Service
- State of California

**Tucker Allotment**

- Vernal Pools
- Allotment/Pasture Bdry

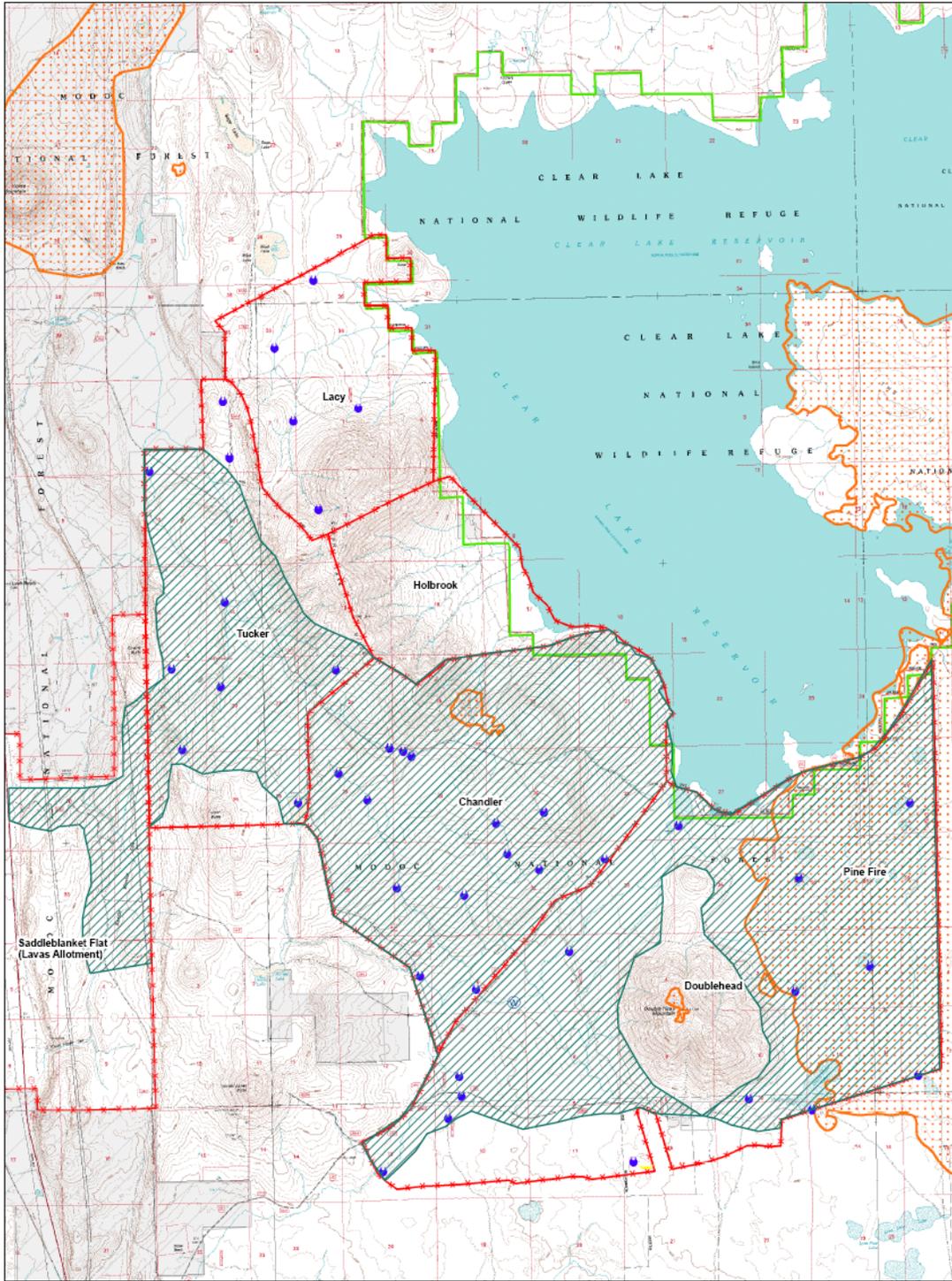
1:77,079  
 0 0.250.5 1 Miles

United States Department of Agriculture  
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 Pacific Southwest Region  
 Modoc National Forest  
 Doublehead Ranger District



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 Produced by: Christina Pearson  
 April 1, 2008  
 P:\swapa\2008 Tucker Vernal Pools.mxd

Figure 2. Tucker Allotment.



- Legend**
- Spring Development
  - Stockponds
  - wells
  - Larranga Sheep Grazing Pattern
  - Wildfires 1979-2001
  - Tucker Allotment Fences
  - Private or Unclassified
  - US Fish and Wildlife Service

**Tucker Allotment  
Sheep Grazing Area  
Current Management  
Figure 3**

1:61,793  
0 0.4 0.8 1.6 Miles

United States Department of Agriculture  
Forest Service  
Pacific Southwest Region  
Modoc National Forest  
Columbia River District

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Produced By: Christine Pearson  
December 7, 2007  
F:\maps\0007\Tucker Sheep grazing.mxd

### Alternative III - Current Management

Under this alternative, 2000 ewe/lamb pairs would be permitted to graze the Tucker Allotment from June 1 to July 15. The areas within the Tucker Allotment used by the sheep would remain the same as under traditional (past) management (Alternative II). The cattle grazing system would also be the same as under traditional (past) management (Alternative II). Flexibility for the order of pasture rotation would be available under the Annual Operating Instructions (AOI).

Allotment	Livestock				Period of Use		Head Months (HM)*
	Permitted Numbers*		Kind	Class	From	To	
	Cows	Sheep					
Tucker		2000	Sheep	Ewe/lamb	June 1	July 15	3,060
	300		Cattle	Cow/calf	May 1	Sept 30	1,530

\*Permitted Numbers are represented by cow/calf pairs (cc). A Head Month is the number of cow/calf pairs times the season of use, considering only one head for each cow/calf pair. A head month is defined as one month's use and occupancy of the rangeland by one weaned or adult cow over six months of age (with or without calf), bull, steer, heifer, burro, mule, bison, ewe (with or without lambs), ram, or goat (Forest Service Handbook 2209.13).

### Alternative IV – Proposed Action

The Forest is proposing to authorize continued cattle grazing on the Tucker Allotment, while discontinuing sheep use. The proposal is to allow 300 cow/calf pairs on the allotment for 5 months of the year, from approximately May 1 to September 30 each year. Cattle would graze the five pastures of the allotment using a deferred rotation system, as in Alternative II. Discontinuing domestic sheep grazing would reduce potential impacts on sage-grouse nesting and brood rearing habitat.

Flexibility exists under the Annual Operating Instructions to rotate cattle through the pastures in a different order each year to accommodate certain resource needs. The rotation schedule can be changed at any time in order to meet certain needs and is negotiated with the livestock permittee. Under the AOI, cattle grazing would be deferred in the pastures where sage-grouse are concentrated during the breeding season and where nests have been found, until July 15 of every year. These pastures currently include Holbrook, Lacy, and portions of Tucker and Chandler. Deferral would be limited to two pastures during any given year. Currently, Holbrook and Lacy appear to be the most critical for the sage-grouse. Cattle would be rotated through the pastures which are not deferred so that no single pasture is grazed first in the season two years in a row. Theoretically a pasture would only be grazed first during one out of every three years.

A proposed rotation schedule which would rotate pasture use first in the season between the Tucker, Chandler, and Doublehead Pastures, while delaying cattle use of the Lacy and Holbrook Pastures until after July 15, is shown in Table 5. The dates are approximate and

the length of time in each unit is based on a minimum of 200 pounds of forage being produced per acre per year. Occasionally it may be necessary to graze Holbrook or Lacy earlier in the grazing season, based on other resource needs or concerns.

Pasture	Year 1	Year 2	Year 3
Chandler	May 1 to June 4	July 12 to Aug 15	June 12 to July 16
Doublehead	July 5 to Aug 15	May 31 to July 11	May 1 to June 11
*Holbrook	Aug 16 to Sept 7	Sept 8 to Sept 30	Aug 16 to Sept 7
*Lacy	Sept 8 to Sept 30	Aug 16 to Sept 7	Sept 8 to Sept 30
Tucker	June 5 to July 4	May 1 to May 30	July 17 to Aug 15
*Notes pastures with sage-grouse concerns			

Under the Annual Operating Permit, actual livestock on-dates are determined by range readiness standards, therefore use dates for each pasture can vary by several days to 2 weeks. During years of abundant forage, livestock may be allowed to graze slightly longer in given pastures, and during years of limited forage (under drought conditions), livestock would be removed early. Grazing use may also be adjusted during years of high winter/spring precipitation, which may preclude entering the allotment on the normal on-date. The allotment pastures are shown in Figure 2.

This proposed action responds to the goals and objectives outlined in the Modoc LRMP by:

- Making lands allocated to livestock grazing available for use by qualified livestock operators. (LRMP, pg 4-19).
- Improve rangeland condition with permitted grazing and forage capacity in balance. (LRMP, pg 4-1).
- Grazing will be managed to maintain desired vegetation expressions and rangelands in satisfactory ecological condition. (LRMP, pg 4-94).
- Contribute to the community economy and provide for sustained outputs of forage products. (LRMP, pg 4-2).
- Provide diverse and productive habitat for a variety of wildlife and fish species. (LRMP, pg 4-2).
- Meet habitat or population objectives for Management Indicator Species. (LRMP, pg 4-4).
- Maintain soil productivity by applying guidelines to areas where management prescriptions are applied: land for timber production, range allotments, and other areas where healthy or productive vegetation is desired. (LRMP, pg 4-21).
- Manage allotments to protect soil, water, and streamside dependent resources. (LRMP, pg 4-19).
- Protect habitat for sensitive plants. (LRMP, pg 4-3).

- Protect cultural resources largely by directing activities or use away from sensitive areas, by maintaining confidentiality, and by informing Forest users of cultural resource protection requirements. (LRMP, pg 4-14).

## Alternatives Considered but Eliminated from Detailed Study

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Federal agencies are required by NEPA to rigorously explore and objectively evaluate all reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 CFR 1502.14). The following alternative was considered but dismissed from detailed consideration for the reasons stated.

### Alternative V: Restricted Sheep Use

**Descriptive Overview:** Allow sheep use in portions of the Tucker Allotment which are currently less suitable as sage-grouse nesting habitat. Use would be restricted to approximately Sections 10, 15, 22, 26, and 27 of the Tucker Pasture, Sections 6, 25, 31, 32, and 36 of the Chandler Pasture, and Sections 6, 13, 17, and 18, and the southern half of Sections 7 and 8 of the Doublehead Pasture. Permitted sheep use would remain at up to 2,000 Ewe/lamb pairs from June 1 through July 15 of each year.

#### Alternative V was eliminated from further consideration due to the following:

- The sheep permittee has indicated on several occasions that he was not interested in using the Tucker Allotment if restricted to use after June 1. The reasoning is that during most years the range forage is inadequate for the sheep. In addition, the potential still remains for conflict between sage-grouse resource needs and sheep use.

## Comparison of Alternatives

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This section provides a summary of the effects of implementing each alternative. Information in the Table 6 is focused on different levels of effects or outputs which can be distinguished quantitatively or qualitatively among alternatives.

<b>Table 6. Comparison of resource effects, by alternative.</b>				
	<b>RESOURCE EFFECTS BY ALTERNATIVE</b>			
<b>RESOURCE</b>	<b>ALTERNATIVE I: NO ACTION (NO GRAZING)</b>	<b>ALTERNATIVE II: TRADITIONAL MANAGEMENT</b>	<b>ALTERNATIVE III: CURRENT MANAGEMENT</b>	<b>ALTERNATIVE IV: PROPOSED ACTION</b>
<b>SUITABLE ACRES GRAZED</b>	0 acres	28,272 acres	28,272 acres	28,272 acres
<b>RANGELAND</b>	Highest overall increase in vegetation production and diversity.	- Trend in forage productivity would continue to increase in areas previously planted with introduced grasses. - No effect to mid and late seral grasslands, but a potential reduction in forb productivity & fine fuels.	Same as Alternative II.	- Trend in forage productivity would continue to increase in areas previously planted with introduced grasses. - No effect to mid and late seral grasslands, but a reduction in fine fuels.
<b>HYDROLOGY/ SOILS</b>	Watersheds would continue to be well below the threshold of concern for cumulative watershed effects.	- Localized areas of soil disturbance in livestock holding and dispersal areas. - No water quality impacts. - No changes to the hydrologic response from storm events. - No additional compacted acres.	Same as Alternative II	Same as Alternatives II & III
<b>BOTANY Threatened, Endangered, &amp; Sensitive Plants (TES)</b>	No adverse effects.	Continued grazing is not likely to have a detrimental impact upon playa phacelia (Sensitive Species) or its habitat. No threatened or endangered plant species concerns.	Same as Alternative II	Same as Alternatives II & III
<b>NOXIOUS WEEDS</b>	Three sites with Mediterranean sage, Musk thistle, or Scotch thistle are located along travel routes, and there is a low to high risk of weed spread due to continued disturbance unrelated to grazing.	Mediterranean sage, Musk thistle and Scotch thistle occur just within the boundaries of the Tucker Allotment. Continued livestock grazing will have a moderate risk of weed spread.	Same as Alternative II	Same as Alternatives II & III

**Table 6. Comparison of resource effects, by alternative.**

<b>RESOURCE EFFECTS BY ALTERNATIVE</b>				
<b>RESOURCE</b>	<b>ALTERNATIVE I: NO ACTION (NO GRAZING)</b>	<b>ALTERNATIVE II: TRADITIONAL MANAGEMENT</b>	<b>ALTERNATIVE III: CURRENT MANAGEMENT</b>	<b>ALTERNATIVE IV: PROPOSED ACTION</b>
<b>TERRESTRIAL WILDLIFE</b>	<p><u>Greater sage-grouse Effects from Cattle &amp; Sheep</u> Potential increase in the availability of forbs &amp; grasses for food &amp; cover, resulting in beneficial effects on sage-grouse habitat. No potential for direct disturbance to nesting sage-grouse or young. <b>Swainson's hawk</b> No negative effects.</p>	<p><u>Greater sage-grouse Effects from Sheep</u> - Sheep use period overlaps with 75% of the peak active growing season of sage-grouse food/cover plants, potentially affecting plant vigor &amp; needs of sage-grouse. Herbaceous plants also potentially affected by repetitious spring use pattern by sheep, which use the same areas every year. Actual potential impacts are unknown. In areas suitable for sage-grouse nesting, preference for forbs &amp; Sandberg's bluegrass by sheep has potential for effects on sage-grouse reproductive success if forbs are limited. <u>Effects from Cattle</u> - Cattle use period overlaps with 50% of the peak active growing season of sage-grouse cover/food plants. Cattle diets dominated by grasses therefore potential effects on habitat components (forbs) critical for sage-grouse reproductive success are limited to grass height. Based on utilization measurements, impacts on grass</p>	<p><u>Greater sage-grouse Effects from Sheep</u> - Delay of sheep use on allotment until June 1 eliminates overlap with the peak of the active growing season of sage-grouse food/cover plants, thus removes pressure during critical growth stages. - Overlap with critical stages of sage-grouse breeding cycle not avoided. <u>Effects from Cattle</u> - Effects the same as under Alternative II. <b>Swainson's hawk</b> Same as Alternative II.</p>	<p><u>Greater sage-grouse Effects from Sheep</u> Elimination of potential impacts to food/cover plants. Potential impacts to nesting sage-grouse &amp; broods eliminated. <u>Effects from Cattle</u> <i>Delay of grazing (under AOI) in areas of concentrated sage-grouse nesting until July 15 would:</i> - Lessen potential impacts to live &amp; residual grass height (cover). - Provide sage-grouse food plants the opportunity to store energy reserves. - Avoid direct disturbance to nesting sage-grouse &amp; broods. <b>Swainson's hawk</b> Direct disturbance to nesting Swainson's hawks unlikely.</p>

<b>Table 6. Comparison of resource effects, by alternative.</b>				
	<b>RESOURCE EFFECTS BY ALTERNATIVE</b>			
<b>RESOURCE</b>	<b>ALTERNATIVE I: NO ACTION (NO GRAZING)</b>	<b>ALTERNATIVE II: TRADITIONAL MANAGEMENT</b>	<b>ALTERNATIVE III: CURRENT MANAGEMENT</b>	<b>ALTERNATIVE IV: PROPOSED ACTION</b>
		height believed to be minimal. - No repeated spring use of the same areas; spring use of a given pasture limited to 1 out of 5 years therefore sage-grouse cover/food plants can build energy reserves & set seed. - Some flexibility exists to avoid known sage-grouse nesting areas during critical stages under the Annual Operating Instructions (AOI). <i>Swainson's hawk</i> - Livestock grazing could result in conditions favorable for prey. - Direct disturbance to nesting Swainson's hawks could occur from the herding and watering of sheep.		
<b>AQUATIC RESOURCES</b>	No negative effects to federally listed Lost River & shortnose suckers.	No perennial streams or spawning habitat for federally listed Lost River & shortnose suckers, thus negative effects very unlikely.	Same as Alternative II	Same as Alternatives II & III
<b>HERITAGE RESOURCES</b>	Trampling of surface artifacts would not occur, but there is potential for accumulation of ground fuels, which could alter or destroy ability to date/age archaeological sites if there is a fire.	Effects through various disturbance mechanisms (reduced ground cover, exposing artifacts to illegal collection), allows possible disturbance to artifacts. Grazing could help in reducing ground fuels & protect archaeological sites	Same as Alternative II	Same as Alternatives II & III

<b>Table 6. Comparison of resource effects, by alternative.</b>				
	<b>RESOURCE EFFECTS BY ALTERNATIVE</b>			
<b>RESOURCE</b>	<b>ALTERNATIVE I: NO ACTION (NO GRAZING)</b>	<b>ALTERNATIVE II: TRADITIONAL MANAGEMENT</b>	<b>ALTERNATIVE III: CURRENT MANAGEMENT</b>	<b>ALTERNATIVE IV: PROPOSED ACTION</b>
		from fire.		
<b>ECONOMICS</b>	Negative effect to Modoc County.	Positive effect.	Positive effect.	Would have a minimal negative effect to Modoc County.

## Monitoring

The type of monitoring that would occur for the proposed action is displayed in Table 7. This plan includes both implementation and effectiveness monitoring. Implementation monitoring is used to determine whether the proposed action is implemented as planned. Implementation monitoring may include range readiness and utilization studies. Effectiveness monitoring is conducted to determine if the management practices applied have been effective in moving the allotment towards meeting the resource goals and objectives as found in the LRMP.

Studies completed by Natural Resources Conservation Service (NRCS), show that low sagebrush canopy cover averaged 22%, ranging from 12% to 32%. On two big sagebrush sites that were surveyed, sagebrush canopy cover averaged 36%. In terms of population, low sagebrush averaged 2,500 plants per acre with an estimated population change (#juvenile-#dead) of +213 plants per acre. On the two big sagebrush sites, the average population size was 4,800 plants/acre with an estimated population change of -70 plants/acre (not enough observations to give a high confidence interval). From these results it was determined that the canopy cover presently meets Western Association of Fish and Wildlife Agencies (WAFWA) Guidelines. (Initial Summary of 2007 Sage-Grouse Habitat Survey Results – Clear Lake, CA).

<b>Table 7. Grazing monitoring/utilization and implementation of the proposed action.</b>				
<b>Monitoring Activity/ Type of Monitoring</b>	<b>Indicator or Standard</b>	<b>When Monitoring Would Occur</b>	<b>Where Monitoring Would Occur.</b>	<b>Frequency of Monitoring</b>
Range readiness/ Implementation	The range would be considered ready when soil is firm enough that livestock would not cause trampling damage to soil and vegetation and when phenological stage or growth of vegetation meets standards. For example when Idaho fescue ( <i>Festuca idahoensis</i> ) is 3 to 4 inches tall & boot has formed or when Sandberg bluegrass ( <i>Poa secunda</i> ) is 2 to 3 inches tall & flowers are open.	Monitoring would occur prior to livestock grazing.	Upland and lake shore key areas.	Annually
Forage utilization of uplands/Implementation	Maintain a minimum of 50% cover. 50% utilization of perennial grasses allowed on rangelands in satisfactory condition. ≤30% utilization on rangelands in unsatisfactory condition.	Utilization monitoring would occur periodically during the grazing season and/or after livestock have left each pasture.	<b>Upland key areas (50%):</b> K01(Cattleguard), K03(Brush), K05(Bitter), K06 (Fayne), K08 (Ranch), K09(Egg), K10 (Homestead), K11 (Radar) & K12 (Wildhorse); <b>Browse key areas (40%):</b> K05 (Bitter), K06 (Fayne), K07 (Dike), K08 (Ranch), K10 (Homestead), and K12 (Wildhorse); & <b>Clear Lake shore key areas (35%):</b> K02 (Goose), K04 (Lake) & K07 (Dike).	Annually
Effectiveness monitoring on range ecological condition and trend.	Seral stage.	Middle of growing season when plants can be identified (May, June or July).	At pre-selected monitoring locations.	Every five years

## Environmental Consequences

This section summarizes the physical, biological, social and economic environments of the affected project area and the potential changes to those environments due to implementation of the alternatives. It also presents the scientific and analytical basis for comparison of alternatives presented in Table 6, above.

## Vegetation and Rangeland Resources

### Affected Environment

The analysis area for rangeland resources consists of the Tucker Allotment boundary. The allotments on the Doublehead are typical of the semi-arid sagebrush steppe of the intermountain west. The Tucker Allotment is dominated by Western juniper (8,798 acres) bunchgrass/dry meadow (5,651 acres), low sagebrush (4,981 acres), and big sagebrush (8,451 acres). In this ecosystem type, wide spaces of bare soil between shrubs and bunchgrasses are common. In field surveys conducted on the Tucker allotment from 1960 to 2007 138 plant species have been identified (Supplemental Range Report, Tucker Allotment. June 2008).

With the exception of areas dominated by Western juniper, the Tucker Allotment appears to be in good ecological health with a seral rating of mid- to late (Table 8) (Ecological Status; Draft R5 Rangeland Plant List revised December 2007). In the 1960s, some areas within the Tucker Allotment had been disked to remove sagebrush, and then seeded with introduced grasses such as wheatgrass. Plots within these areas were visited in 2005. It was observed that the vegetation consisted of an increased number of native grasses, forbs and shrubs, and fewer of the introduced grasses. Comparing the 2005 plot data with data collected from these plots in prior years indicates the ecosystem is recovering.

Seral Stage:	Number of Plants:	Seral Stage:	Number of Plants:
Early/Introduced	47 (27 early)	Early/Mid	7
Mid	40	Mid/Late	8
Late	36	Totals:	138
(Introduced Only)	(20)		

This allotment falls within the Modoc LRMP Management Area #66 – Clear Lake, and has a grazing strategy of C (Extensive Management Strategy, Modoc LRMP, Appendix O), which states: “Management seeks full utilization of forage available to livestock. Cost effective management systems and techniques, including fencing and water developments, are designed and applied to obtain relatively uniform livestock distribution and use of forage to maintain plant vigor.

Approximately 2000 acres have been invaded by medusahead, which in Modoc County is a “C” rated weed. “C” rated weeds are those where holding action and eradication occur only when found in nurseries or in cropseed. “C” rated weeds are generally widespread. One area

with “C” rated weeds is located in the Doublehead pasture as a result of the 1999 Pine Fire; the second is located in the Lacy pasture. It is most likely that current livestock grazing is not a major factor in the introduction and spread of these weeds. A Noxious Weed Risk Assessment was prepared for this project. Issues regarding weeds are also being addressed at the Forest level through a Forest-wide EIS, and therefore, noxious weed management activities will not be included in this analysis.

### ***Capability/Suitability***

Land capability and suitability for livestock grazing is determined at the Forest and site-specific levels. The Tucker Allotment was determined to be capable for livestock grazing during the planning and analysis for the LRMP in 1991. Capability is defined in 36 CFR 219.3 and Forest Service Manual 1905. Capability, specific to grazing, is defined as lands accessible to livestock, producing forage or having inherent forage-producing capability, and able to withstand grazing on a sustained basis under reasonable management practices. Accessible areas that produce forage as a result of timber management practices, fire, or other events may be classified as capable rangeland. Capability depends upon current conditions and site conditions such as climate, slope, landform, soils, and geology. Non-capable lands include areas of steep slopes (not accessible), areas where palatable forage is lacking, where water sources are too distant, or where lands cannot be grazed without extensive management improvements added. The LRMP, as amended, defines capable rangeland as accessible land with forage-producing capability of 200 pounds per acre or more that can be grazed on a sustained yield, multiple-use basis (SNFPA, 2004). As Table 9 shows, the Tucker Allotment is 99.9% suitable for livestock grazing.

The Tucker Allotment is comprised of lands identified in the Modoc LRMP as suitable for grazing. Where consistent with other multiple use goals and objectives, congressional intent is to allow grazing on suitable lands (*Multiple Use and Sustained Yield Act of 1960, Wilderness Act of 1964, Forest and Rangeland Renewable Resources Planning Act of 1974, Federal Land Management and Policy Act of 1976, National Forest Management Act of 1976*). Where consistent with the goals, objectives, standards and guidelines of the LRMP and its amendments, Forest Service policy is to make forage from lands suitable for grazing available to qualified livestock operators (*FSM 2202.1, FSM 2203.1, 36CFR 222.2 (c)*). Suitability for grazing on the Tucker Allotment has been verified as being appropriate. A rangeland capability and suitability assessment is included in the project record, and is available upon request.

<b>Table 9. Estimated Allotment Suitable Acres.</b>			
<b>Allotment</b>	<b>Total Forest Service Acres</b>	<b>Suitable Acres</b>	<b>% Suitable</b>
Tucker	28,288	28,272	99.9%

## Alternative I – No Action (No Grazing)

### **Direct and Indirect Effects**

Under this alternative, routine land stewardship would continue, which includes: fire suppression, road maintenance, or other administrative activities that address threats to life and property. This alternative complies with 40 CFR 1502.14(d), which requires that a no-action alternative be included in the analysis.

The long-term vegetation trend would likely be continued improvement in health and vigor of forage plants; however, some species that are adapted to disturbance may begin to show decline. Implementation of Alternative I would result in the highest overall increase in vegetation production and diversity.

With no grazing there is potential for an increase of non-native species that may be kept under control by grazing. There would likely be an increase in fine fuels which could increase the chances of catastrophic wildfires.

## Alternatives II and III – Traditional Management and Current Management

### **Direct and Indirect Effects**

The direct effects of livestock grazing on the allotment are possible soil compaction and trampling along trails to and from water, salt licks, and from one grazing area to another. Soil compaction and trampling would be minimal and the effects would be for a short duration as the sheep move from one area to another without covering the same area twice. Other direct effects would be some disturbance occurring to Swainson's hawk's nests in the area as sheep, dogs and the herders move through the different pastures. Cows tend to shade up under the larger junipers during the heat of the day under trees that could potentially be used by Swainson's hawk's for nesting.

Additionally, disturbance to sage-grouse could occur as sheep, dogs and herders move through the different pastures and because sheep eat similar forage to sage-grouse. Cattle disturbance can occur to nesting birds as cows and calves eat hiding cover, and scratch or rub on larger sagebrush. To minimize these impacts and how sheep are grazed through each pasture, discussions and grazing routes will be mapped out, as well as on the ground meetings of where sheep are to graze. For cattle grazing, meetings will be held annually with the permittee to discuss grazing rotations, salting locations, and other pertinent information as it comes up.

The direct effects of sheep and cattle on the allotment are possible soil compaction and trampling in those areas where the sheep are herded for grazing, and where cattle are concentrated. For Alternative II where the timing of sheep use would be early in the growing season, introduced annual grasses such as cheatgrass and medusahead could be grazed, therefore there could be less pressure on native grasses in localized areas. There is the

potential for disturbance to nesting sage-grouse and impacts to herbaceous cover by both cattle and sheep.

Permitted livestock grazing would be consistent with LRMP allowable use standards and guidelines. Implementing LRMP direction has demonstrated rangelands in satisfactory condition are maintained or improved. Annual utilization monitoring along with range readiness checks each spring and before livestock move into the next scheduled unit are tools used to check on the health and condition of an area.

Overall, a trend in forage productivity would continue to increase in areas previously planted with introduced grasses. There would be no effect to mid and late seral grasslands, but potential for a reduction in forb productivity and fine fuels.

## Alternative IV – Proposed Action

### **Direct and Indirect Effects**

In the absence of sheep, there may be an increase in introduced annuals, such as cheatgrass, due to the lack of grazing pressure. Reduced grazing pressure by sheep may increase forb productivity. Exclusion of cattle from certain pastures early in the season on a consistent basis could decrease plant species diversity due to the development of medusahead thatch.

Absence of cattle in the pastures used by nesting sage-grouse would remove disturbance to sage-grouse during the critical periods of the reproductive cycle and remove pressure on herbaceous plants needed for cover by sage-grouse.

Overall, a trend in forage productivity would continue to increase in areas previously planted with introduced grasses. There would be no effect to mid and late seral grasslands, but there would be a reduction in fine fuels.

The proposed action would not adversely impact public health and safety. In the area east of Highway 139 the major recreational activity is mule deer and pronghorn antelope hunting. Because water is scarce in the area of the Clear Lake Hills and Doublehead Mountain, most of the dispersed camping occurs around Quaking Aspen Spring.

### **Cumulative Effects for Alternatives II, III, and IV**

In 2006 the District wildlife biologist proposed a western juniper thinning project which encompassed 2,569 acres within the Clear Lake Hills in T46N, R7E sections 17 through 21, 28, 29, 32 and 33. Called the Mountain Big Sage Maintenance Project, it involved the cutting of western juniper trees in order to reduce the competition with the understory vegetation for nutrients, moisture and light. The majority of the project area was to be treated. The only acreage which was not treated is currently devoid of juniper. The purpose of the project was to remove western juniper, which has encroached into the mountain big sage habitat in the Clear Lake Hills on the Tucker Allotment. This management action would improve habitat conditions for sage-grouse and other wildlife dependent upon sage and the herbaceous understory of forbs and grasses. The mountain big sage habitat in the Clear Lake Hills provides some of the best available nesting habitat for the only remaining sage-grouse in this portion of northwestern California, referred to as the Devil's Garden.

## **Soils and Hydrology** \_\_\_\_\_

### **Affected Environment**

The Tucker range allotment lies entirely within the Land Type Association (LTA) called "M261Gb\_WJmc" (Smith and Davidson 102). It is a flat area composed of basalt and andesite. The soil temperatures are mesic, meaning that they are warm during the summer.

The soils themselves are mostly lithic argixerolls (clayey, shallow, and dry), a type of mollisols, which is a productive soil type.

Presently within the allotment there are intermittent or seasonally flowing streams, stock ponds, and vernal pools. There are no known floodplains, but there may be seasonally wet or moist areas associated with the south western shore of Clear Lake within the Tucker Allotment. Soil compaction has occurred within these areas from the effect of multiple use land management activities. Within the Tucker Allotment the soils have a range of moderate to high maximum erosion potential (on steeper pitches with slopes greater than 35%), with the dominant erosion rate of moderate. The soils with high erosion potential have a tendency to be a coarse textured soil (poorly developed soils that have a shallow depth to bedrock) and are generally associated with the steeper pitches of the Clear lake Hills Area.

No Proper Functioning Condition Ratings have been completed for the intermittent drainages within the Tucker Allotment.

#### Alternative I: No Action (No Grazing)

##### **Direct and Indirect Effects**

Hydrologic processes would continue to be shaped by natural events, including snow melt, storm events, and wildfires. Watersheds would continue to be well below the threshold of concern for cumulative watershed effects.

#### Alternatives II, III, & IV: Traditional Management, Current Management, & Proposed Action

##### **Direct and Indirect Effects**

The most likely effects of livestock grazing are associated with areas of concentrated use (stock trails, gathering areas, stock ponds and travel corridors) and livestock impacts (trampling and chiseling) within areas with sensitive soils.

The soils associated with stock ponds are compacted and trampled from livestock activity. The level of soil compaction around stock ponds is an acceptable level of impact as these sites were developed as water sources in order to keep cows out of more sensitive stream and riparian areas. Soil compaction severity from the effects of livestock depends on the scale of the analysis area (7<sup>th</sup> field sub watershed to small basin) and the maximum erosion hazard of the soils effected. The level of soil compaction around stock ponds when considered at the 7<sup>th</sup> field sub watershed scale, generally accounts for no more than two percent of the watershed (7<sup>th</sup> field sub watershed = approximately 2000 acres).

The remainder of the effects to soil quality may be from soil disturbance in areas associated with stock trails, gathering locations, and travel corridors. The disturbance to the soil would be from breaking up the surface soil layer, and compaction of soil associated with a high and very high erosion hazard rating. Based on the effects analysis, and comparison of effects of livestock grazing across the forest, it has been estimated that approximately six percent of the land base has been disturbed by livestock grazing.

The primary effects of livestock grazing are impacts to water quality (increased levels of turbidity and water temperature), and the possible modification of rainfall runoff based on increased levels of soil compaction.

Past Best Management Practices (BMPs) monitoring has shown that with the exception of isolated areas adjacent to Clear Lake there are generally no water quality impacts from livestock grazing within the Tucker Allotment.

Best Management Practices (BMPs) to be applied is as follows:

1. BMP 8.1 Range Analysis and Planning
2. BMP 8.2 Grazing Permit System
3. BMP 8.3 Rangeland Improvements

### **Cumulative Effects**

The overall effects of livestock grazing do not appear to create additional compacted acres within the affected sub-watershed to create changes to the hydrologic response from storm events, nor will they create irreversible changes to the overall watershed resource. It is unlikely to result in the occurrence of cumulative effects to either soil or water quality. Since LRMP Standards & Guidelines and BMPs would be applied, the proposed activity would meet Region 5 Soil Quality Standards. Less than six percent of the land base will have additional soil compaction from the proposed activity.

## **Heritage Resources**

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### **Affected Environment**

The Tucker Allotment lies within the ethnographic territories of the *Gumbatwas* band (western portion) and the *Kokiwias* band (eastern portion) of the Modoc Tribe. There have been about 13 previous acceptable archaeological surveys within the allotment covering about 1,340 acres (4.7% of the Allotment). These surveys have yielded 75 archaeological sites (73 prehistoric, 1 prehistoric/historic, and 1 historic), collectively covering about 530 acres. The prehistoric site types include lithic scatters, temporary camps, and sites with complex rock stacks and/or alignments, and habitation structures. At present there are no properties listed on the NRHP within the allotment.

### **Alternative I: No Action (No Grazing)**

#### **Direct and Indirect Effects**

The indirect effect of the “No Action” alternative would result from a lessening or elimination of site trampling, lateral displacement of surface artifacts (especially when livestock walk over a site in muddy ground conditions), and soil compaction attributed to general livestock grazing. However, some level of site trampling/lateral displacement/soil compaction would still take place as result of large wildlife species (e.g., elk).

### **Cumulative Effects**

This action would most likely result in an overall reduction of site disturbances due to trampling, lateral displacement of artifacts, and soil compaction, due to the elimination of livestock. It is also possible that an associated increase in surface vegetation, primarily grasses, may result in the reduction of ground surface visibility, making the surface identification of archaeological remains (e.g., surface lithics) more difficult. This reduction surface visibility, however, may result in increased site protection from “pot hunters” because they can no longer easily see surface artifacts.

### **Alternatives II, III & IV: Traditional Management, Current Management, & Proposed Action**

#### **Direct and Indirect Effects**

These alternatives would result in a continuation of direct effects on Heritage Resources, as it would result in the continuation of livestock grazing. This action would continue on-going site disturbances due to trampling, lateral displacement of artifacts, and soil compaction, due to livestock grazing. It is also possible that it would keep surface vegetation, primarily grasses in present condition, allowing for the continued surface identification of archaeological remains (e.g., surface lithics). This surface visibility also allows “pot hunters” to easily see surface artifacts and subject them to illegal collection.

Indirect effects would continue to subject archaeological sites to some level of site disturbance and slow degradation.

#### **Cumulative Effects**

This action would most likely result in the continuation of site disturbances due to trampling, lateral displacement of artifacts, and soil compaction, due to continued livestock grazing. It is also possible that an associated *status quo* in surface vegetation, primarily grasses, may result in the continued ground surface visibility, making the surface identification of archaeological remains (e.g., surface lithics) relatively unhindered. This surface visibility also allows “pot hunters” to easily see surface artifacts and subject them to illegal collection.

## **Botany**

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### **Affected Environment**

#### **Threatened, Endangered, and Sensitive Plant Species**

No federally listed Threatened or Endangered plant species are known within the analysis area. The Sensitive species Playa phacelia (*Phacelia inundata*) occurs along the edge of this allotment, and the habitat for this species is vernal pools.

## Alternative I: No Action (No Action)

### **Direct and Indirect Effects**

There would be no adverse impacts to Playa phacelia in the absence of grazing.

## Alternatives II, III & IV: Traditional Management, Current Management, & Proposed Action

### **Direct and Indirect Effects**

Vernal pool habitat exists for the sensitive species Playa phacelia (*Phacelia inundata*), and there was one occurrence of this plant found during field surveys on the Tucker Allotment. On August 30, 2005 a field survey was conducted on the Tucker Allotment and at that time no plants were found due to the lateness of the survey. Habitat was found but impacts from livestock were minimal. Continued grazing at currently permitted use levels is not likely to have a detrimental impact upon Playa phacelia or its habitat.

### **Determination of Effects**

It has been determined that under the action alternatives, grazing activity “may impact individuals or habitat, but will not likely contribute towards a trend in federal listing or loss of viability to the population or species” for playa phacelia.

## **Noxious Weeds** \_\_\_\_\_

### Affected Environment

The following species are known to exist along the perimeter of the Tucker allotment: Scotch thistle (*Onopordum acanthium*), Mediterranean sage (*Salvia aethiopsis*), and musk thistle (*Carduus nutans*) (Figure 2).

Vulnerability within the allotment to noxious weeds ranges from low to high. Soils in the project area are nearly all mollisols, which are favorable to weed growth. Noxious weeds always pose a threat to sensitive plants on this Forest and other Federal lands. Any habitat that has a low percent cover of native vegetation, or is disturbed, has a high level of vulnerability for noxious weed invasion.

## Alternative I: No Action (No Grazing)

### **Direct and Indirect Effects**

Because grazing would not occur on the allotment there is the decreased risk of introduction and spread of noxious weeds.

## Alternatives II, III & IV: Traditional Management, Current Management, & Proposed Action

### **Direct and Indirect Effects**

Vulnerability within the allotment to noxious weeds ranges from low to high. Soils in the project area are nearly all mollisols, which are favorable to weed growth. Noxious weeds always pose a threat to sensitive plants on this Forest and other Federal lands. Any habitat

that has a low percent cover of native vegetation, or is disturbed, has a high level of vulnerability for noxious weed invasion.

## Terrestrial Wildlife

### Affected Environment

Sagebrush and the native grasses and forbs of the shrub-steppe are important sources of food and cover for wildlife (Dealy et al. 1981 as cited in Paige and Ritter, 1999). Many of the species associated with sagebrush are restricted to these habitats during the breeding season and/or year-round (obligates). Of these sagebrush obligates, sage-grouse is the only species of urgent concern on the Modoc National Forest due to its low population level and rapid decrease in numbers at the one known remaining active sage-grouse lek (display/breeding site) within the forest.

A list of R5 Forest Service Sensitive, and federally threatened, endangered, and candidate wildlife and aquatic species, which are present or have the potential to occur within the project area, are presented in Table 10. This table indicates which species could potentially be affected by the project.

Table 10. Region 5 Forest Service Sensitive Species, and Federally Threatened and Endangered Species known to occur, or with the potential to occur, within the Tucker Allotment, Doublehead Ranger District, Modoc National Forest.			
Common Name ( <i>Scientific Name</i> )	Habitat is not in or adjacent to the Project area and would not be affected	Habitat is in or adjacent to the project area, but is not negatively affected directly or indirectly	Habitat is potentially affected by the project
<b>R5 USFS Sensitive Species</b>			
<b>Birds</b>			
Northern goshawk ( <i>Accipiter gentillis</i> )	X		
Swainson's hawk ( <i>Buteo swainsoni</i> )			X
Great gray owl ( <i>Strix nebulosa</i> )	X		
California spotted owl ( <i>Strix occidentalis occidentalis</i> )	X		
Greater sage-grouse ( <i>Centrocercus urophasianus</i> )			X
Greater sandhill crane ( <i>Grus Canadensis tabida</i> )	X		
Willow flycatcher ( <i>Empidonax trailii</i> )	X		
<b>Mammals</b>			
Pallid bat ( <i>Antrozous pallidus</i> )	X		
Townsend's big-eared bat ( <i>Corynorhinus townsendii</i> )	X		
California wolverine	X		

Table 10. Region 5 Forest Service Sensitive Species, and Federally Threatened and Endangered Species known to occur, or with the potential to occur, within the Tucker Allotment, Doublehead Ranger District, Modoc National Forest.

Common Name ( <i>Scientific Name</i> )	Habitat is not in or adjacent to the Project area and would not be affected	Habitat is in or adjacent to the project area, but is not negatively affected directly or indirectly	Habitat is potentially affected by the project
( <i>Gulo gulo luteus</i> )			
American marten ( <i>Martes americana</i> )	X		
Sierra Nevada red fox ( <i>Vulpes vulpes necator</i> )	X		
California bighorn sheep ( <i>Ovis canadensis californiana</i> )	X		
<b>Federally Threatened or Endangered Species</b>			
<b>Birds</b>			
Northern spotted owl ( <i>Strix occidentalis caurina</i> )	X		
Bald eagle ( <i>Haliaeetus leucocephalus</i> )	X		
<b>Federal Candidate Species</b>			
<b>Birds</b>			
Yellow-billed cuckoo ( <i>Coccyzus americanus</i> )	X		

## Swainson's Hawk

Due to its association with grassland and agricultural fields, this species is not common on the Modoc National Forest. The known historic concentration of nest sites on the forest is in the extreme northwestern portion of the Doublehead Ranger District where 11 nest sites were known to occur. This area is about 20 miles from the Tucker Allotment.

Swainson's hawk nest territories could be present within the Tucker Allotment due to the presence of open shrub habitats and grass dominated low sage sites south of Clear Lake. Potential nest trees are available throughout the allotment. Based on records in the National Diversity Database, an occupied Swainson's hawk nest territory was present within two miles of the Doublehead Pasture in 1981.

In native habitats, the Swainson's hawk forages in open stands of grass-dominated vegetation, sparse brushlands, and small, open woodlands, which is found on the Tucker Allotment has adapted well to foraging in agricultural areas such as wheat and alfalfa. Over most of the species' range, breeding Swainson's hawks show a strong dependence on ground squirrels, voles, or other abundant small mammal prey. In northeastern California, montane voles and Belding's ground squirrels contributed over 70% of prey items identified by Woodbridge (1991). Territory density appears to be positively associated with the availability of specific regional prey (Ibid).

## Alternative I: No Action (No Grazing)

### **Direct and Indirect Effects**

Woodbridge (1998) ranked various habitats as foraging habitat for Swainson's hawks in California based on studies in the Central Valley (Estep 1989) and Great Basin (Woodbridge 1991). Perennial grassland was ranked as having high prey population size as well as high availability due to consistently high access to prey. Areas within the Tucker Allotment impacted by the Pine Fire, which have not been overtaken by medusahead, remain dominated by perennial grasses. Based on the ranking of foraging habitat suitability, the elimination of grazing is unlikely to have much of an impact on the availability of prey in the areas dominated by perennial grasses. Sagebrush habitat was ranked by Woodbridge (1998) as having low populations of prey desirable to the Swainson's hawk. Because sagebrush is ranked low as foraging habitat and is not preferred by the Swainson's hawk, the elimination of grazing is unlikely to have much effect on the suitability of this habitat type to the Swainson's hawk.

Implementation of the no grazing alternative is unlikely to result in negative direct or indirect effects to the Swainson's hawk.

### **Cumulative Effects**

Implementation of the no grazing alternative would not result in cumulative impacts to the Swainson's hawk.

## Alternatives II, III & IV: Traditional Management, Current Management, & Proposed Action

### **Direct and Indirect Effects**

In general, foraging habitat for the Swainson's hawk could be favored by livestock grazing under these alternatives in areas of concentrated livestock use. Grasshoppers, which are eaten by the Swainson's hawk starting around August, are much more abundant on moderately or heavily grazed ranges than on ungrazed or lightly grazed ranges (Nerney 1958 and Holmes et al. 1979, as cited in Holechek 2001).

In perennial grassland vegetation types, heavy grazing can allow invasion by annual forbs and grasses (Ellison 1960 as cited by Holechek et al. 2001). Annuals are important foods of many species of rodents. Populations of several small mammal species appear to fluctuate in response to the availability of these food items (Wood 1969 as cited by Holechek et al. 2001). Because small mammals are important in the diets of Swainson's hawks during the breeding season, the result of livestock grazing could result in conditions favorable for prey. It is unlikely the presence of livestock grazing would have negative impacts on the foraging habitat of the Swainson's hawk.

Under Alternatives II and III, direct disturbance to nesting Swainson's hawks could occur from the herding and watering of sheep if these activities occur close to an active nest.

## Cumulative Effects

Implementation of Alternatives II, III, and IV would not result in any cumulative impacts to the Swainson's hawk.

## Sage-grouse

Because sage-grouse are a Management Indicator Species (MIS) as well as R5 Forest Service Sensitive, the analysis of effects for this species is covered in the following section titled "Management Indicator Species".

## Management Indicator Species

Management Indicator Species (MIS) for the Modoc NF are identified in the 2007 Sierra Nevada Forests Management Indicator Species (SNF MIS) Amendment (USDA Forest Service 2007). The habitats and ecosystem components and associated MIS analyzed for the project were selected from this list of MIS, as indicated in Table 11. In addition to identifying the habitat or ecosystem components (1<sup>st</sup> column), the CWHR type(s) defining each habitat/ecosystem component (2<sup>nd</sup> column), and the associated MIS (3<sup>rd</sup> column), the table discloses whether or not the habitat of the MIS is potentially affected by the Tucker Allotment (4<sup>th</sup> column).

Habitat or Ecosystem Component	CWHR Type(s) defining the habitat or ecosystem component <sup>1</sup>	Sierra Nevada Forests Management Indicator Species <i>Scientific Name</i>	Category for Project Analysis <sup>2</sup>
Riverine & Lacustrine	lacustrine (LAC) and riverine (RIV)	aquatic macroinvertebrates	1
Shrubland (west-slope chaparral types)	montane chaparral (MCP), mixed chaparral (MCH), chamise-redshank chaparral (CRC)	fox sparrow <i>Passerella iliaca</i>	N/A
Sagebrush	Sagebrush (SGB)	greater sage-grouse <i>Centrocercus urophasianus</i>	3
Oak-associated Hardwood & Hardwood/conifer	montane hardwood (MHW), montane hardwood-conifer (MHC)	mule deer <i>Odocoileus hemionus</i>	N/A
Riparian	montane riparian (MRI), valley foothill riparian (VRI)	yellow warbler <i>Dendroica petechia</i>	1
Wet Meadow	Wet meadow (WTM), freshwater emergent wetland (FEW)	Pacific tree frog <i>Pseudacris regilla</i>	1
Early Seral Coniferous Forest	ponderosa pine (PPN), Sierran mixed conifer (SMC), white fir (WFR), red fir (RFR), eastside pine (EPN), tree sizes 1, 2, and 3, all canopy closures	Mountain quail <i>Oreortyx pictus</i>	1
Mid Seral Coniferous Forest	ponderosa pine (PPN), Sierran mixed conifer (SMC), white fir (WFR), red fir (RFR), eastside pine (EPN), tree size 4, all canopy closures	Mountain quail <i>Oreortyx pictus</i>	1
Late Seral Open Canopy Coniferous Forest	ponderosa pine (PPN), Sierran mixed conifer (SMC), white fir (WFR), red fir (RFR), eastside pine (EPN), tree	Sooty (blue) grouse <i>Dendragapus obscurus</i>	1

Table 11. Selection of MIS for Project-Level Habitat Analysis for the Tucker Allotment.

Habitat or Ecosystem Component	CWHR Type(s) defining the habitat or ecosystem component <sup>1</sup>	Sierra Nevada Forests Management Indicator Species <i>Scientific Name</i>	Category for Project Analysis <sup>2</sup>
	size 5, canopy closures S and P		
Late Seral Closed Canopy Coniferous Forest	ponderosa pine (PPN), Sierran mixed conifer (SMC), white fir (WFR), red fir (RFR), tree size 5 (canopy closures M and D), and tree size 6.	California spotted owl <i>Strix occidentalis occidentalis</i>	N/A
		American marten <i>Martes americana</i>	1
		northern flying squirrel <i>Glaucomys sabrinus</i>	1
Snags in Green Forest	Medium and large snags in green forest	hairy woodpecker <i>Picoides villosus</i>	1
Snags in Burned Forest	Medium and large snags in burned forest (stand-replacing fire)	black-backed woodpecker <i>Picoides arcticus</i>	1

<sup>1</sup> All CWHR size classes and canopy closures are included unless otherwise specified; **dbh** = diameter at breast height; **Canopy Closure classifications:** S=Sparse Cover (10-24% canopy closure); P= Open cover (25-39% canopy closure); M= Moderate cover (40-59% canopy closure); D= Dense cover (60-100% canopy closure); **Tree size classes:** 1 (Seedling)(<1" dbh); 2 (Sapling)(1"-5.9" dbh); 3 (Pole)(6"-10.9" dbh); 4 (Small tree)(11"-23.9" dbh); 5 (Medium/Large tree)(≥24" dbh); 6 (Multi-layered Tree) [In PPN and SMC] (Mayer and Laudenslayer 1988).

<sup>2</sup> **Category 1:** MIS whose habitat is not in or adjacent to the project area and would not be affected by the project.  
**Category 2:** MIS whose habitat is in or adjacent to project area, but would not be either directly or indirectly affected by the project.  
**Category 3:** MIS whose habitat would be either directly or indirectly affected by the project.

Species categorized under Category 1 will not be discussed further in this analysis because their habitats do not occur within the Tucker Allotment. These species are aquatic macro-invertebrates, yellow warbler, Pacific tree frog, mountain quail, sooty or blue grouse, American marten, northern flying squirrel, hairy woodpecker, and black-backed woodpecker.

The fox sparrow, mule deer, and California spotted owl are not applicable to this document because the Modoc National Forest LRMP MIS list as amended by the SNF MIS ROD (2007) does not include them.

The MIS whose habitat would be either directly or indirectly affected by the Tucker Allotment, identified as Category 3 in Table 11, are carried forward in this analysis, which will evaluate the direct, indirect, and cumulative effects of the proposed action and alternatives on the habitat of these MIS. The MIS selected for Project-Level MIS analysis for the Tucker Allotment is the greater sage-grouse.

## Sage-grouse

### Affected Environment

Within the Devil’s Garden/Clear Lake Sage-grouse Active Population Management Unit, there were 46 active leks in the late 1940s and nine by 1977. Six out of the 46 leks were within the Tucker Allotment, and three leks were on the adjacent Clear Lake National Wildlife Refuge (NWR). Between the early 1990s and the end of the decade, the number of lekking male sage-grouse counted on the NWR dropped precipitously. The peak number of males counted on the main lek on the NWR declined from 60 birds in 1992 to 11 birds by

1999. Since the early 1980s sage-grouse had not been observed on 18 historic leks in the close vicinity to Clear Lake on the Modoc National Forest. In the spring of 2002, there was only one lek remaining which had five males, and one satellite lek with 11 males, both on the NWR. In 2005, the number of males at the only known remaining active sage-grouse lek on the NWR, dropped to six birds from the 2004 count of approximately 12 birds. Given the number of strutting males at the one remaining lek, the population estimate for the number of native sage-grouse would be 35 birds (Gregg 2007).

As a result of the noted declines in the sage-grouse population at Clear Lake, NWR staff conducted a radio-telemetry study of the habitat sage-grouse use between April of 2000 and April of 2002. The results of the study indicated the sage-grouse spent early to late summer either on the Modoc National Forest south of Clear Lake and east of Doublehead Mountain, or on the NWR. During the rest of the year, the majority were found on the NWR. Locations on the Modoc were mostly in the unburned areas within the perimeter of the 1999 Pine Fire within the Doublehead Pasture of the Tucker Allotment, and in the western portion of the adjacent Carr Allotment. Results of the telemetry also suggested the Devil's Garden/Clear Lake population is non-migratory and isolated.

From 2005 through 2008, over 50 sage-grouse were translocated to the Clear Lake area in an attempt to boost the population. Radio transmitters were also placed on these birds. Based on radio-telemetry data, habitat utilized by the trans-located sage-grouse for breeding is primarily located in the Clear Lake Hills and areas east to the shoreline of Clear Lake, and on the NWR. In 2007, data indicates areas within the Tucker Allotment are being used for nesting. General areas of sage-grouse use are shown in Figure 4.

The land within the Tucker Allotment provides important breeding and wintering habitat for sage-grouse. The majority of the sage-grouse habitat use on the Modoc National Forest by the Devil's Garden/Clear Lake population of translocated sage-grouse is on the Tucker Allotment. Sage-grouse native to the area primarily use the Carr and Tucker Allotments. Suitable sage-grouse habitat present in the Tucker Allotment includes Mountain big sagebrush present in the Clear Lake Hills, Doublehead Mountain and foothill areas, low sage in the flats south of Clear Lake, and seasonally wet areas. It is also believed there may be Lahontan sagebrush in portions of the Tucker Allotment (Horney 2008). Western juniper are scattered through portions of the sagebrush habitat and occur at the greatest densities in the southern portion of the Chandler Pasture and southwest portion of the Doublehead Pasture, and the western portion of the Tucker Pasture.

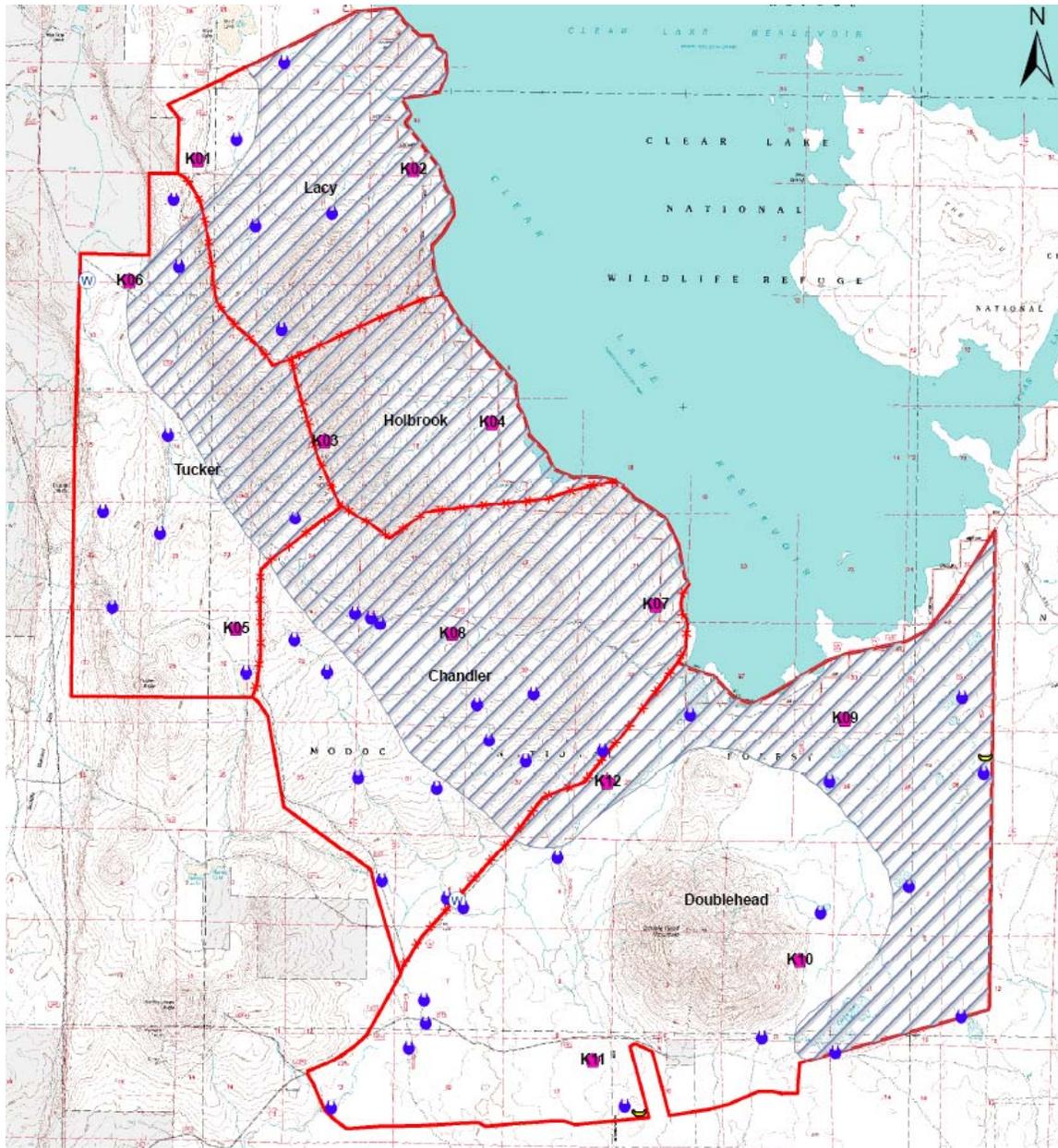
A large portion of the low sage habitat south of Clear Lake on the Doublehead Pasture was burned by the Pine Fire in 1999. As a result of the fire, the low sage habitat burned is no longer suitable for nesting. Islands of unburned sage habitat do occur however, and may continue to be used by the native sage-grouse. The burned area of the Pine Fire has become revegetated with native grasses and forbs and is believed to provide foraging habitat for sage-grouse, particularly during the breeding season. Low sagebrush sites have the potential to be richer in forbs than big sagebrush sites and are attractive to pre-laying hens (Barnett and Crawford 1994). However, since the Pine Fire, some areas have become infested with medusahead and native species have been unable to re-establish in these areas.

Plant species occurrence within the Tucker Allotment is available from range data collected within the Tucker Allotment through range condition and trend transects. Data collected

between 1960 and 2007 indicate that 138 species of plants occurred in the area over the 45 year period. These species include forbs, grasses, shrubs, and a few introduced species. Not all of these species are necessarily present currently. Plant species composition and cover data from these transects is not available. Of the forbs identified, those found in the range transects which are important in the diets of sage-grouse are listed in Table 12.

Vegetation data was also collected from April through October of 2007 in an effort lead by the Natural Resource and Conservation Service (NRCS). Seven transects were established in the Tucker Allotment, one in the adjacent Carr Allotment to the east, and one on the Clear Lake National Wildlife Refuge. Data was collected on the composition of forbs (wildflowers), grasses and shrubs. Five of the eight transects were located in areas known to be used by translocated sage-grouse based on radio-telemetry. Four of these same transects were located in areas which are known to have had concentrations of livestock use in the past, although not necessarily during the 2007 grazing season. These data are based on a small sample size of transects that are limited in number and distribution through the allotment. Although the data may not represent the variety of conditions occurring in the allotment, they are believed to represent the situation at the individual transect sites.

Over 65 species of forbs were identified collectively within the NRCS transects sampled (Table 12). Thirteen of the genera, some represented by multiple species, found by the Forest Service and the NRCS have been documented to be present in the diets of sage-grouse.



**Legend**

- Pit Tank
- Water Trough
- Well
- Key Areas
- Unit Fences
- Sage Grouse General Use Area
- Tucker Allotment

### Tucker Allotment Sage Grouse Current General Use Areas

1:76,885  
0 0.250.5 1 Miles

United States Department of Agriculture  
Forest Service  
Pacific Southwest Region  
Modoc National Forest  
Chandler Ranger District



**DISCLAIMER:**  
The USDA Forest Service uses the most current and complete data available. GIS data and product accuracy may vary. Using GIS products for purposes other than those for which they were intended may yield inaccurate or misleading results. The USDA Forest Service reserves the right to correct, update, modify, or replace GIS products without notification. This map was prepared using Modoc National Forest data as of 2007.

Produced By: Christina Pearson  
March 25, 2010  
F:\map\2010 Tucker\report\environment

**Figure 4. General location of sage-grouse on the Tucker Allotment.**

Table 12. Forbs identified by NRCS and the U.S. Forest Service in the Tucker and Carr Allotments, and on the Clear Lake National Wildlife Refuge.			
<i>Achillea millefolium</i>	<i>Adonis aestivalis</i>	<i>Agoseris glauca</i>	<i>Agoseris retrorsa</i>
<i>Alyssum desertorum</i>	<i>Antennaria argentea</i>	<i>Antennaria dimorpha</i>	<i>Apocynum androsaemifolium</i>
<i>Arabis sparsiflora</i>	<i>Arenaria congesta</i>	<i>Astragalus lemmonii</i>	<i>Astragalus purshii</i>
<i>Balsamorhiza macrolepis</i> var. <i>platylepis</i>	<i>Balsamorhiza sagittata</i>	<i>Blepharipappus scaber</i>	<i>Calyptridium umbellatum</i>
<i>Camissonia tanacetifolia</i>	<i>Castilleja applegatei</i>	<i>Chrysolepis chrysophylla</i>	<i>Cirsium cymosum</i>
<i>Collinsia parviflora</i>	<i>Crepis acuminata</i>	<i>Crepis modocensis</i>	<i>Crepis occidentalis</i>
<i>Crocidium multicaule</i>	<i>Cryptantha intermedia</i>	<i>Draba verna</i>	<i>Erigeron bloomeri</i>
<i>Erigeron divergens</i>	<i>Eriogonum nudum</i>	<i>Eriogonum umbellatum</i>	<i>Fritillaria pudica</i>
<i>Geum triflorum</i>	<i>Hieracium scouleri</i>	<i>Horkelia fusca</i>	<i>Hydrophyllum capitatum</i>
<i>Leucocrinum montanum</i>	<i>Lithophragma parviflora</i>	<i>Lomatium macrocarpum</i>	<i>Lomatium piperi</i>
<i>Lactuca serriola</i>			
<i>Lomatium triternatum</i>	<i>Lomatium vaginatum</i>	<i>Lotus purshianus</i>	<i>Lupinus agenteus</i>
<i>Lupinus brevicaulis</i>	<i>Lupinus Lepidus</i>	<i>Montia linearis</i>	<i>Paeonia brownie</i>
<i>Phacelia hastata</i>	<i>Phacelia linearis</i>	<i>Phlox diffusa</i>	<i>Phlox gracilis</i>
<i>Phlox hoodii</i>	<i>Phoenicaulis cheiranthoides</i>	<i>Plagiobothrys mollis</i>	<i>Polyctenium fremontii</i>
<i>Ranunculus glaberrimus</i>	<i>Ranunculus testiculatus</i>	<i>Senecio canus</i>	<i>Senecio integerrimus</i>
<i>Sidalcea glaucescens</i>	<i>Taraxacum officinale</i>	<i>Tragopogon dubius</i>	<i>Trifolium macrocephalum</i>
<i>Viola beckwithii</i>	<i>Viola glabella</i>	<i>Wyethia mollis</i>	
Green & Yellow = Genera/Species consumed by sage-grouse			
Yellow = found in Forest Service range condition & trend transects but not by NRCS.			

Several species of grass and an upland sedge were identified in the NRCS transects. Sandberg bluegrass (*Poa secunda*) comprised 75% of the observations in transects sampled. Measurements of grass height were made from late August through late September of 2007. Maximum leaf height for Sandberg bluegrass was 10 inches (26 cm), and average leaf height was 3 inches (8 cm). Other species present were bluebunch wheatgrass (*Pseudoroegneria spicata*) and crested wheatgrass (*Agropyron cristatum*), which is an introduced species. Maximum leaf heights for these two species were in excess of 12 inches (30 cm), with average leaf heights of 8 inches (20 cm). Based on observations, these species are present throughout the Clear Lake Hills, but are believed to be patchy in distribution. The densest bluebunch wheatgrass stand was at T04 on the Clear Lake Refuge at 15%, and the densest crested wheatgrass stand was at T06 in the Clear Lake Hills at 28%. In the remaining transects these grasses represented less than 5% of the count. Intermediate and pubescent wheatgrasses (varieties of *Elytrigia intermedia*) were seen in the Clear Lake Hills, but only detected at one transect (T10).

Connelly et al. (2000) recommends managing for grass height of at least 7 inches tall (18 cm) for nest concealment during the nesting period of sage grouse (April through June). Based on this limited data, areas where bluebunch wheatgrass, crested wheatgrass, or intermediate

wheatgrass are present, grass heights would probably meet the 7 inch height target. Outside of areas where those species are common, the grass height target may not be met, at least not during drought years. Grass measurements were made in 2007 which was considered to be a dry year for the Clear Lake Watershed (unpublished data, U.S.BOR 2007). During the growing season of 2006, which was considered to have above average precipitation, grass heights were approximately double of what they are in dry to average years (C. Pearson 2007). Given the dry conditions of 2007, the limited number and the distribution of transects, and the lack of site specific data on which areas were grazed by cattle and sheep, no conclusions can be drawn on the adequacy or limitations of grass height needed for sage-grouse nest concealment in the Tucker Allotment.

## Alternative I: No Action (No Grazing)

### **Direct and Indirect Effects**

The complete removal of cattle and sheep from the allotment would be expected to result in no negative effects to the vegetation and sage-grouse, and could result in an increase in the availability of forbs and grasses. The reduced competition for forage resulting from the absence of livestock, and potential increases in the amount of herbaceous cover, could result in beneficial effects to sage-grouse habitat.

### **Cumulative Effects**

There would be no cumulative effects as a result of implementation of the no grazing alternative.

## Alternative II: Traditional (Past) Management

### **Direct and Indirect Effects**

#### ***Introduction:***

Significant relationships between specific habitat characteristics and annual reproductive success of sage-grouse are substantiated by numerous studies (Crawford et al. 2004). Adequate habitat provides the cover necessary to conceal nests and provides the foods necessary for hens to lay eggs (Barnett and Crawford 1994). The condition of the habitat also has potential to influence other aspects of sage-grouse population dynamics including clutch size, nest and re-nest likelihood, and survival of juveniles and breeding-aged birds. Legumes and composite forbs, insects, succulent mesic vegetation, and sagebrush are important for chick survival and recruitment into the adult population (Crawford et al. 2004).

The degree of influence domestic livestock can have on plant community composition and sage-grouse depends upon intensity, season, duration and frequency of use, level of selectivity and site characteristics. These factors, in combination with climate, influence plant longevity and recruitment, and will affect plant composition over time. Also, the evolutionary history of the Intermountain-Sagebrush Region in relation to herbivory influences ecosystem response to livestock grazing (Stebbins 1981, Milchunas et al. 1988 as cited in Miller et al. 1994). Other factors which influence the potential degree of impact include condition of the habitat as a result of past management, fire frequency, and grazing history. These variables are discussed below.

### ***Effect of Grazing on Forbs Preferred by Sage-grouse:***

The degree of damage by cattle and sheep grazing to forbs preferred as food items by sage-grouse was summarized by Miller and Eddleman (2000). Results of the summary indicate that many forbs were either undamaged or only slightly damaged by sheep grazing; however, three were severely damaged by sheep, whereas only one of those sage-grouse preferred food items was severely damaged by cattle (Miller and Eddleman 2000). In addition, cattle grazing did not result in the decline of any of the preferred forb food species, whereas sheep grazing resulted in the decline of three forb species key to the diet of sage-grouse (*Astragalus* spp., *Crepis* spp., and *Lomatium* spp.), all of which are known to occur in the Tucker Allotment.

The range of utilization levels represented in the studies summarized by Miller and Eddleman (2000) is unknown. It is known that some of the experiments included heavy grazing pressure by sheep. Because of the variability between the grazing intensities in the studies and those on the Tucker Allotment, it is unknown if livestock grazing has resulted in damage to forb populations on the Tucker Allotment. Data on the site specific impacts of cattle and sheep grazing on the species diversity, distribution, density, and vigor of the food forbs preferred by sage-grouse are unavailable for the Tucker Allotment. It is possible, although unknown, that damage to forbs could occur in localized areas of concentrated livestock use on the Tucker Allotment. Until more data is available, conclusions regarding the degree of potential impacts from livestock grazing, on the forbs preferred by sage-grouse, cannot be made.

### ***Direct Disturbance From Livestock:***

Forced movement of cattle and sheep across the range would be the most likely scenario under which sage-grouse nests, hens, and young broods would be impacted by being caught in the path of such a livestock drive (Autenrieth 1981). It is known that hens will abandon the nest with little provocation while laying their eggs and yearling hens are prone to abandon their nests even during incubation, when disturbed (Ibid). Nelson (1955), as cited by Autenrieth (1981), reported a sage-grouse nest was deserted after cattle had been driven through the area. Nest desertion caused by migrant bands of sheep was documented by Patterson (1952), as cited in Rowland (2004). In situations other than livestock drives, there are only a few documentations of direct disturbance to nesting sage-grouse by livestock. In a study of sage-grouse in Utah, two out of 161 nests were found to be trampled by livestock (one sheep, one cattle) and five were deserted due to disturbance by livestock (Rasmussen and Griner 1938 as cited by Rowland 2004). In a different study in Utah, two instances of nest abandonment related to livestock grazing were found during seven years of observation; one was caused by cattle, the other by sheep (Danvir 2002, as cited by Rowland 2004).

Direct disturbance to strutting male sage-grouse at the Tuledad Valley Road Lek near Duck Flat south of Eagleville, California was documented in 2006. In this instance the sheep herder's trailer was parked within 50 yards of the lek. On April 6<sup>th</sup>, 30 sheep were observed standing directly in the lek. Three sheep dogs were present and barking, and one ran straight through the lek causing the sage-grouse to scurry out the way. On April 27<sup>th</sup>, 200 sheep were in the area, 50 of which were standing in the lek. There were also four dogs and a sheep herder in the lek. No sage-grouse were present, although 19 were present just a week earlier

when the sheep were further away from the lek. According to a May 10, 2006 Memorandum from the Surprise Valley Resource Area of the Bureau of Land Management, it was concluded that the presence of sheep directly in the lek caused the sage-grouse to temporarily abandon the lek, resulting in cessation of strutting. This type of direct disturbance resulted in a direct affect to the breeding activity of sage-grouse.

Social interactions between domestic livestock and wildlife are difficult to study because factors such as terrain, forage availability, water distribution, and vegetation structure confound results (Holechek et al. 2001). There are no data available to indicate whether or not there is a definite social aversion to livestock by sage grouse (Ibid).

For the purpose of this analysis, it is assumed that the presence of livestock (cattle or sheep) in areas used by sage grouse for nesting could have some negative effects. Based on professional judgment, potential effects could include avoidance of suitable habitat when livestock are present, disturbance of nesting activities, and effects on the movements of sage grouse broods during their search of suitable foraging habitat.

### ***Sheep Grazing Impacts:***

Under traditional grazing management, sheep are permitted in the Tucker Allotment from April 16 through May 31. This time frame coincides with critical stages of the reproductive cycle of sage-grouse, and is during the active growing period of herbaceous vegetation when grazing can affect plant vigor, as has been demonstrated by studies.

Sheep use of the allotment overlaps with several key phases of the sage-grouse breeding season as follows: 1) the pre-incubation period of sage-grouse females which is a time when forb consumption is positively correlated with the likelihood of brood production (Gregg 2006), 2) the peak nest initiation period (Gregg 2007), 3) the sage-grouse nesting period (Ibid), 4) peak hatching (Ibid), 5) early brood rearing period when insect availability, particularly Lepidoptera, are positively correlated with higher chick numbers (Gregg 2006); host plants for Lepidoptera include herbaceous plants, and 6) brood rearing, a time during which forbs are a very important dietary component for young sage-grouse survival.

The use of sage-grouse habitat by sheep within the April/May time frame carries the risk of decreasing herbaceous production and cover. This period of use overlaps with approximately 6 out of 8 weeks of the peak active growing season of the herbaceous understory. Grazing by sheep during this time, particularly heavy grazing, removes the photosynthetic material from forbs and grasses at just the time when it is needed for the repair of winter damage and for renewed growth (Laycock 1967). If protected during the spring, the herbaceous vegetation can reach full maturity unhindered, and increase in vigor (Ibid). In addition, sheep use on the allotment follows the same general pattern every year with use starting in the Tucker Pasture, then movement to the Chandler Pasture, and on to the Doublehead Pasture last. This pattern results in the same areas being grazed at the same time every year during the time when forbs and grasses are at their most vulnerable growth phase. Energy reserves for most perennial forbs are at their lowest as plants emerge from winter dormancy and begin to establish new leaf material. Grazing during early spring will put additional stress on range plants when their energy levels are already low (Adams et al. 2004). Grazing of grasses which may be of short stature to begin with (Sandberg bluegrass) could affect the height needed as cover for

concealment of sage-grouse nests. Sanberg bluegrass is known to be favored by sheep (B. Reed 2007 and Jensen et al. 1971).

Use of the Doublehead Pasture by sage-grouse native to the Devil's Garden/Clear Lake population has been documented through radio-telemetry. This pasture is believed to provide an important forb component in the diet of sage-grouse, as well as some nesting and lek habitat. The amount of suitable sage-grouse habitat in this pasture has declined due to the Pine Fire in 1999 and the resulting increase in areas dominated by medusahead. As a result, sheep are competing with sage-grouse for more limited resources in this pasture, than prior to the fire. In addition, the presence of sheep during the active growing period of the herbaceous layer is in conflict with the conservation action under Goal 7 of the conservation strategy for this population of sage-grouse. This management recommendation states "where cheatgrass and medusahead are present, grazing should be managed to allow existing perennial grasses and forbs to accumulate energy and complete their reproductive cycles at high vigor, so as to compete with the annuals."

Based on principles documented in the literature, it is assumed that the repetitious spring use pattern and period of use by the sheep during the nesting period of sage-grouse on the Tucker Allotment poses some risk to the vegetation components important as cover and in the diets of sage-grouse during the breeding season. These potential impacts to the herbaceous layer could affect the reproductive success of sage-grouse in the Devil's Garden/Clear Lake Population Management Unit. The actual impacts of sheep on the herbaceous layer in the Tucker Allotment have not been quantified.

### ***Cattle Grazing Impacts:***

Grazing of uplands at the initiation of the seasonal grazing period in spring by cattle coincides with sage-grouse nesting, peak hatching, and early brood rearing periods in a portion of the pastures during any given year. Under the current deferred rotation system, some flexibility exists to avoid use of pastures where sage-grouse nesting is known to occur; however, given the number of pastures and the known nesting areas for sage-grouse, total avoidance of nesting areas during the critical portion of the breeding cycle cannot be achieved.

The deferred rotation grazing system in place for cattle on the Tucker Allotment prevents repeated use of the same areas in spring, any two years in a row. Theoretically, any given pasture would only be grazed first in the spring once out of every five years. Over the ten-year period from 1997 through 2006, the number of times each pasture was grazed first in the season (starting May 1 and for a duration of 3 to 6 weeks) was as follows: Lacy – once; Tucker – four with no two years in a row; Doublehead – twice; Chandler – three with no two years in a row; Holbrook – Zero. The advantage of deferred rotation is providing an opportunity for the herbaceous vegetation to build its energy reserves and reach full maturity with production of seed, before the onset of grazing. Cattle grazing on the Tucker Allotment overlaps with about four out of eight weeks of the peak active growing season of herbaceous plants.

Although the diets of cattle are dominated by grass, they do also consume forbs; however, at a much lower percentage of their diets than is the case for sheep. Herbaceous vegetation in the pastures grazed during the first 6 weeks after the onset of cattle grazing is likely to be the most affected. Because these same pastures do not receive repeated use every spring, and because the diet of cattle are dominated by grass, the effects of cattle grazing on the forb component important to sage-grouse are believed to pose less risk than the impacts from sheep grazing.

Because cattle prefer grass, they could impact the height of grasses needed for sage-grouse nest concealment and protection from predators, particularly in areas utilized to the 50% level; however, this is unknown. Portions of the allotment receive little to no livestock use and the use that occurs is patchy. As a result, 50% utilization would occur only in localized areas. Utilization data collected at Key Areas in the Tucker Allotment from 1993 through 2007 indicated that out of 118 measurements at Key Areas, utilization levels only reached 50% in five instances. In 24 instances, utilization levels were between 35% and 45%, and one was between 45% and 50%. All other measurements indicated utilization levels were less than 35%. It must be noted however, that large gaps in sampling data occur.

In a study near Rawlins, Wyoming, 30 to 40% annual removal of herbaceous vegetation during the growing season by cattle made no significant difference on the cover and height of residual grasses the following spring during nesting, however, 50% removal resulted in significant reductions in residual grass heights (Heath et al. 1998 as cited in Kuipers 2004).

No studies are available to indicate any direct “cause and effect” relationship between cattle grazing and the population health of sage-grouse (Gregg 2007).

### **Cumulative Effects**

The cumulative effects of higher densities of western juniper, residual impacts of heavy historic grazing practices, vegetation type conversions, prescribed and wild fire, and drought have changed the quantity and quality of the habitat for sage-grouse in the Tucker Allotment and within the Devil’s Garden/Clear Lake Population Active Management Area. The influence of these factors has resulted in areas still dominated by wheatgrass, pockets of medusahead, and areas with very little herbaceous understory. The cumulative result is that there is less quality habitat for sage-grouse than was the case prior to European settlement. The presence of livestock during the vulnerable plant growth phases and in sage-grouse nesting and brood rearing areas introduces more competition with sage-grouse for potentially limited resources. This is more likely the case for the low sage habitat on the Doublehead Pasture than for the big sage habitat in the hilly areas in the Clear Lake Hills and on Doublehead Mountain. Big sage habitat is relatively productive and is able to withstand some grazing pressure if it is in good condition to begin with (Gregg 2007).

Current and planned juniper removal should play a significant role in restoration of sage-grouse habitat. Elimination of competition from juniper may result in buffering some of the potential effects of livestock grazing to the herbaceous understory.

## Alternative III: Current Management

### **Direct and Indirect Effects**

Delaying sheep use within sage-grouse habitat on the Tucker Allotment until June 1 eliminates overlap with the peak of the active growing season of the herbaceous understory. This timing helps remove pressure on the forbs when they are most vulnerable to impacts from grazing. Delay of sheep grazing until June 1 would not avoid conflicts with critical stages of the sage-grouse breeding cycle. The first two weeks of June correspond with the early brood rearing period during which the availability of forbs and insects is positively correlated with higher chick numbers/survival (Gregg 2006). During the last two weeks of June, most sage-grouse broods are not yet mobile, and are at a vulnerable stage (Gregg 2007). As a result, the presence of bands of sheep within nesting areas during the month of June would pose a high level of risk to sage-grouse chicks.

The impacts to sage-grouse and their habitat from cattle use would be the same as under Alternative II.

### **Cumulative Effects**

Cumulative effects to sage grouse habitat would be expected to be similar to those described for Alternative II.

## Alternative IV: Proposed Action

### **Direct and Indirect Effects**

#### ***Sheep Grazing:***

Discontinuing sheep use on the Tucker Allotment would remove the repetitious spring use pattern on the herbaceous understory by sheep during the time when the plants are coming out of winter dormancy. Protection of the herbaceous understory from sheep grazing during the peak of the active growing season would allow the plants to reach full maturity unhindered, to store energy reserves and increase in vigor. As a result, risks to the health of the vegetation components important as cover and in the diets of sage-grouse during the breeding season would be reduced.

In the absence of sheep during the critical stages of the sage-grouse breeding cycle, potential impacts to nesting sage-grouse and their broods would be eliminated.

#### ***Cattle Grazing:***

Beck and Mitchell (2000) suggest removing livestock from sage-grouse nesting areas prior to peak standing-crop development to maintain residual grass growth essential for nest concealment (Gregg et al. 1994) and then delay grazing the same areas until after nesting. Implementation of the Annual Operating Instructions described earlier in this document would result in delay of grazing in areas known to have nesting sage-grouse which would reduce potential impacts to grass height needed for nest concealment, and direct disturbance to sage-grouse. With specific reference to grazing management of the Tucker Allotment, Gregg (2007) recommended delaying use of the pastures with sage-grouse nesting until at least July 1, and preferably after July 15<sup>th</sup>, to avoid critical stages of the brood rearing period

and the most vulnerable stages of chick development. Implementation of the AOI described under Alternative IV would achieve this goal for areas of known concentrated nest establishment, but not for all potential nest areas in the Tucker Allotment.

Deferral of spring grazing would permit seed production of herbaceous plants, seedling establishment, and restoration of plant vigor in the pastures being deferred. Deferral is beneficial if it results in avoiding livestock use of pastures until after the critical growth stage of the herbaceous plants has passed (flowering, seed ripe, and maturity). Implementation of the AOI described under Alternative IV would result in rest from grazing during these critical growth stages of herbaceous plants. Deferral, along with moderate rates of stocking, promotes the full growth potential of range vegetation (Adams et al. 2004).

Regarding the sage-grouse breeding season, deferral of cattle use in the pastures with concentrated sage-grouse nesting would provide for the following:

- Avoid direct disturbance to sage-grouse during nesting and early brood rearing periods which would prevent the potential for cattle to trample nests and to affect the foraging patterns of juvenile sage-grouse.
- Avoid grazing during the critical growth stage of the plants, thereby allowing sage-grouse forage plants the opportunity to store energy reserves.
- Lessen the impact of grazing on live and residual grass height needed for concealment of nests.

### **Cumulative Effects**

Cumulative effects to sage grouse habitat by cattle would be expected to be similar to those described for Alternatives II and III. No cumulative effects would be expected from the removal of sheep from the allotment.

## **Aquatics**

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### **Affected Environment**

A list of R5 Forest Service Sensitive, and federally threatened, endangered, and candidate aquatic species, which are present or have the potential to occur within the project area, are presented in Table 13. This table indicates which species could potentially be affected by the project. Potential effects will be described for those species whose habitat is in or adjacent to the project area, but is not negatively affected directly or indirectly.

Table 13. Region 5 Forest Service Sensitive Aquatic Species, and Federally Threatened and Endangered Aquatic Species known to occur, or with the potential to occur, within the Tucker Allotment, Doublehead Ranger District, Modoc National Forest.			
Common Name ( <i>Scientific Name</i> )	Habitat is not in or adjacent to the Project area and would not be affected	Habitat is in or adjacent to the project area, but is not negatively affected directly or indirectly	Habitat is potentially affected by the project
<b>R5 USFS Sensitive Species</b>			
<b>Amphibians</b>			
Cascade frog ( <i>Rana cascade</i> )	X		
Northern leopard frog ( <i>Rana pipiens</i> )	X		
Spotted frog ( <i>Rana pretiosa</i> )	X		
<b>Reptiles</b>			
Northwestern pond turtle ( <i>Clemmys marmorata</i> )	X		
<b>Aquatic Invertebrates</b>			
CA floater (freshwater mussel) ( <i>Anodonta californiensis</i> )	X		
Scalloped juga (snail) ( <i>Juga (Calibasis) acutifilosa</i> )	X		
<b>Inland &amp; Anadromous Fishes</b>			
Goose Lake sucker ( <i>Catostomus occidentalis lacusanserinus</i> )	X		
Goose Lake tui chub ( <i>Gila bicolor thallassina</i> )	X		
Goose Lake lamprey ( <i>Lampetra tridentata ssp.</i> )	X		
Warner Valley redband trout ( <i>Oncorhynchus mykiss</i> ) pop 4	X		
Goose Lake redband trout ( <i>Oncorhynchus mykiss</i> ) pop 6	X		
<b>Federally Threatened or Endangered Species</b>			
<b>Fish</b>			
Lost River sucker ( <i>Deltistes luxatus</i> )		X	
Shortnose sucker ( <i>Chasmistes brevirostris</i> )		X	
Modoc sucker ( <i>Catostomus microps</i> )	X		
<b>Invertebrates</b>			
Shasta crayfish ( <i>Pacifastacus fortis</i> )	X		
<b>Federal Candidate Species</b>			
<b>Amphibians and Reptiles</b>			
Oregon spotted frog ( <i>Rana pretiosa</i> )	X		

## Lost River and Shortnose Suckers

### Affected Environment

Lost River (*Deltistes luxatus*) and shortnose (*Chasmistes brevirostris*) suckers are endemic to the upper Klamath Basin in south-central Oregon and north-central California. These species were federally listed as endangered in 1988 due in large part to a decline in the populations of Upper Klamath Lake, which at the time were considered the primary populations for both species (Federal Register 1988). Clear Lake also supports viable populations of Lost River and shortnose suckers. Results of studies subsequent to the 1988 listing indicated that Lost River and shortnose suckers in Clear Lake were more abundant than initially thought and may represent a large proportion of the total remaining fish of each species (USFWS 2002). Results of more recent fisheries investigations in Clear Lake indicate that populations of endangered suckers appear stable based on evidence of recruitment into the population (Barry et al. 2007).

The Lost River and shortnose suckers typically occupy lake environments and migrate up tributaries in early spring to spawn. Several weeks after hatching, young-of-year fish return to the lake environment (Buettner and Scoppettone 1990, Scoppettone and Vinyard 1991, as cited in Perkins and Scoppettone 1996).

Clear Lake is a shallow, turbid reservoir with lake levels regulated by a dam at the outlet to the Lost River. The area surrounding Clear Lake is largely volcanic in origin, which contributes fine inorganic silt to the lake.

Clear Lake's main tributary is Willow Creek, which is joined by Boles Creek 4.9 miles upstream. Willow Creek, Boles Creek, and Fletcher Creek (a tributary to Boles Creek), provide spawning habitat for the Lost River and shortnose suckers (Buettner and Scoppettone, 1991). These tributaries are outside the Tucker Allotment. Willow Creek enters Clear Lake on the east side of the lake. Within the Tucker Allotment, all drainages are intermittent and are not used by the Lost River or shortnose suckers.

### Alternative I – No Action (No Grazing)

#### Direct, Indirect, and Cumulative Effects

Implementation of the no grazing alternative would not result in any negative direct, indirect, or cumulative impacts to the Lost River and shortnose suckers.

## Alternative II – Traditional (Past) Management

### **Direct and Indirect Effects**

The traditional grazing management system for the Tucker Allotment was evaluated by the U.S. Fish and Wildlife Service through a Biological Opinion (B.O.) in 1996. This B.O. covered the grazing program for allotments within the Big Valley, Devil’s Garden, and Doublehead Ranger Districts which affected federally listed sucker species. According to the B.O., the grazing program may improve habitat conditions for the listed suckers, but relative to no grazing, the rate of succession may be slower under the traditional grazing system. The focus of the B.O. was on perennial streams, and associated riparian habitat, because of their importance to suckers as spawning, rearing, and holding habitat. No perennial streams or spawning habitat is present for the Lost River and shortnose suckers in the Tucker Allotment. In addition, drainages are intermittent and usually dry by the time livestock occupy the allotment. As a result, livestock do not concentrate in the drainages nor cause erosion of the stream banks. Thus, the presence of livestock should result in little to no sediment input to Clear Lake. Therefore, implementation of Alternative II is unlikely to have any impacts to the Lost River and shortnose suckers.

The B.O. issued by the U.S. Fish and Wildlife Service determined that “the effects of livestock grazing are not likely to jeopardize the continued existence of the federally endangered listed suckers.”

## Alternatives III and IV – Current Management and Proposed Action

### **Direct and Indirect Effects**

Effects to Lost River and shortnose suckers under these alternatives would be the same as under Alternatives II and III.

## **Socio-Economic Factors** \_\_\_\_\_

### **Affected Environment**

The analysis area for effects to socio-economic factors is Modoc County, California. The following demographic and statistical information was obtained from the Sage Steppe Ecosystem Restoration Strategy Final EIS, (April 2008).

The Tucker Allotment is located in Modoc County, California. In 2004 Modoc County had a population of 9,650. For the last 15 years, the population of Modoc County has remained nearly constant. Total personal income for Modoc County has steadily increased between 1990 and 2002. The business and industry sectors in Modoc County include: agriculture and mining; construction; manufacturing; transportation and public utilities; wholesale trade; retail trade; finance, insurance and real estate; services; government; and tourism. Over the 12-year period for which data was reported, agriculture earnings shows some fluctuation in earnings, probably due to variation in crop and beef prices and the costs of production. In Modoc

County the government and public administration sector accounted for the largest number of employees (1,300) in 2002, followed by the Agriculture and Mining sector with 746 employees. The average poverty rate in Modoc County in 1999 was 21.5 percent, above the statewide average of 14.2 percent. This was the highest poverty rate among all the northern California counties in 1999 and the fifth highest statewide.

None of the alternatives would have disproportionate effects on any person or group on the basis of race, color, national origin, age, sex, religion, or sexual orientation.

### Alternative I: No Action (No Grazing)

#### **Direct and Indirect Effects**

This alternative would result in no authorized grazing on the Tucker Allotment, and would have the biggest economic effect to the permittees in Modoc County. There would be a 100% reduction in the permitted number of head months (number of cow/calf pairs, and ewe/lambs multiplied by months in the grazing season) in the Tucker allotment. This would likely result in loss of income for the permittees, Modoc County, and loss of jobs in Modoc county. This loss in jobs would occur in the agriculture sector, which is already in decline.

### Alternative II: Traditional Management

This alternative would have continued livestock grazing on the Tucker Allotment. There would be no reduction in income for Modoc County.

### Alternative III: Current Management

Under this alternative, there would no reduction in income for Modoc County.

### Alternative III: Proposed Action

This alternative would result in sheep grazing being discontinued on the Tucker Allotment. This alternative would see a slight reduction for income in Modoc County. The primary industry in Modoc County is Government followed by Agriculture.

## **Short-Term Uses and Long-Term Productivity**\_\_\_\_\_

The National Environmental Policy Act requires consideration of “the relationship between short-term uses of man’s environment and maintenance and enhancement of long-term productivity” (40 CFR 1502.16).

The No Action Alternative would result in no livestock grazing and, therefore, no short-term rangeland use, and no effect to the long-term productivity of the allotment. The proposed alternative and monitoring plan, through the AMP (which includes LRMP standards and guidelines) and AOIs would ensure that both the short-term use and long-term productivity of the rangeland resources on the allotment are maintained and the ecological condition continues to improve.

Long-term productivity refers to the capacity of the rangeland to provide for resources into the future. All alternatives are expected to improve rangeland resources by improving the condition of the upland ecosystems on the allotment. One difference between the alternatives is the expected rate at which improvements in the ecological condition will be realized. All

of the alternatives are expected to positively affect the long-term productivity of the allotment through the improvement of the sagebrush habitat.

## **Irreversible and Irretrievable Commitments of Resources**

Irreversible commitments of resources are those that cannot be regained, such as the extinction of a species or the removal of a mined ore. No irreversible commitments of resources would result from implementation of any of the alternatives because no permanent, irreversible resource loss would occur.

Irretrievable commitments of resources are those that are lost for a period of time and are likely to remain so, such as the temporary poor condition of vegetation in an individual management unit. The gap between the current condition and the potential productivity would be an ongoing irretrievable loss. Irretrievable losses can be regained over time.

No irretrievable commitments of resources would result from implementation of Alternative I, the No Action Alternative, because no grazing would occur and, therefore no significant resource losses of any kind would result. Under Alternative II and III, short-term rangeland vegetation loss (foraging, browsing, and trampling of forbs and fine fuels) would occur in some areas within the Tucker Allotment. Forage productivity overall would continue to increase, mainly for mid- and late seral grasslands and shrub lands.

## **Consultation and Coordination**

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The Forest Service consulted the following individuals, Federal, State, and local agencies, tribes and non-Forest Service persons during the development of this environmental assessment:

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Klamath Tribes

Pit River Tribe

**FEDERAL, STATE, AND LOCAL AGENCIES:**

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