

United States
Department of
Agriculture

Forest
Service

Intermountain
Region

Uinta- Wasatch-Cache
National Forest

September 2009



Environmental Assessment

Monte Cristo Area Sheep Allotments

Ogden Ranger District, Uinta-Wasatch-Cache National Forest
Cache, Rich and Weber Counties, Utah

Township 8 North, Range 4 East, Sections 4-9; 15-36 SLM
Township 7 North, Range 4 East, Sections 4-6; 9 SLM

ENVIRONMENTAL ASSESSMENT

MONTE CRISTO AREA SHEEP ALLOTMENTS

Uinta-Wasatch-Cache National Forest
Ogden Ranger District
Cache, Rich, and Weber Counties, Utah
September 2009

Responsible Official:

Rick Hopson
Ogden Ranger District
507 25th Street
Ogden, Utah 84401
(801) 625-5112

For Further Information Contact:

Evelyn Sibbernsen, Environmental Coordinator
Logan Ranger District
1500 East Highway 89
Logan, Utah 84321
(435) 755-3620

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202)-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 1400 Independence Avenue, SW, Washington, DC 20250-9410 or call (202)-720-5964 (voice or TDD).

USDA is an equal opportunity provider and employer.

Table of Contents

Chapter 1	Purpose and Need	Page
1.1	Introduction	1
1.2	Background and History	2
1.3	Proposed Action	2
1.4	Purpose and Need	3
1.5	Forest Plan Direction	4
1.5.1	Management Prescriptions	4
1.5.2	Management Areas	4
1.5.3	Desired Future Conditions	4
1.5.4	Standards and Guidelines	5
1.6	Decision to be Made	5
1.7	Public Involvement	5
1.8	Issues	5
1.9	Other Disclosures	6
1.9.1	Rare Plants	6
1.9.2	Noxious Weeds	7
1.9.3	Inventoried Roadless Areas	8
1.9.4	Heritage Resources	8
1.9.5	Air Quality	9
1.9.6	Environmental Justice	9
Chapter 2 Alternatives		
2.1	Introduction	11
2.2	Formulation of Alternatives	11
2.3	Alternatives Considered and Eliminated from Detailed Analysis	11
2.4	Alternatives Considered in Detail	11
2.4.1	No Action (No Grazing)	12
2.4.2	Proposed Action (Current Management)	12
2.5	Mitigation and Management Requirements	18
2.6	Monitoring Activities	21
2.7	Comparison of Alternatives	23
2.8	Comparison of Effects	24
Chapter 3 Affected Environment and Environmental Effects		
3.1	Introduction	27
3.1.1	List of Past, Present, and Reasonably Foreseeable Future Actions	27
3.2	Aquatic Resources	28
3.3	Rangeland Resources	33
3.4	Recreation	37
3.5	Soil Quality	39
3.6	Water Quality	45
3.7	Wildlife	52
Chapter 4 Response to Comments		71
REFERENCES		87

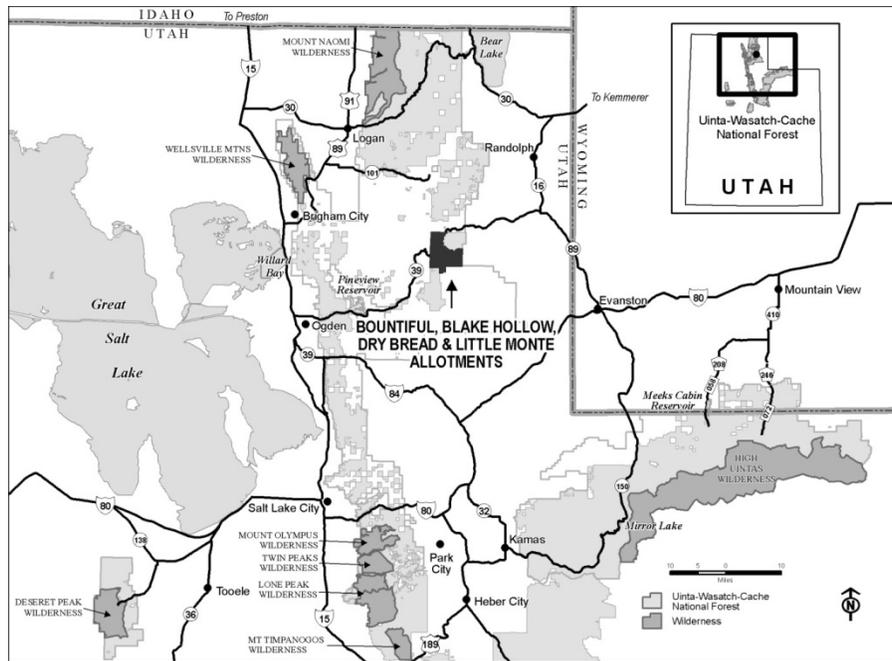
Environmental Assessment Monte Cristo Area Sheep Allotments

Chapter 1 – Purpose and Need

1.1 Introduction

The Blake Hollow, Bountiful, Dry Bread, and Little Monte Allotments (referred to as the Monte Cristo Area Sheep Allotments) are located in Cache, Rich and Weber Counties approximately 30 miles northeast of Ogden, Utah (see Figure 1.1) in T8N, R4E, Sections 4-9 and 15-36 and in T7N, R4E, Sections 4-6, and 9 SLM. Lands within these allotments are managed by the Ogden Ranger District of the Uinta-Wasatch-Cache National Forest. The allotments include approximately 16,400 permitted acres.¹

Figure 1.1 Monte Cristo Area Sheep Allotments Vicinity Map



The Ogden Ranger District of the USDA Forest Service has developed a proposed action for issuance of a term grazing permit for these allotments. Compliance with the National Environmental Policy Act (NEPA) is required when permits are issued (or re-issued). This document describes these allotments, and describes the proposed action, purpose and need for this action, and discloses the environmental effects.

¹ Acreage based on corporate GIS layer for the Wasatch-Cache National Forest, 2009. Any discrepancy in allotment acreages between this document and others referred to or cited herein are a result of differences and/or improvements in mapping technologies or mapping purposes.

1.2 Background and History

The Ogden Ranger District has authorized livestock grazing on the Monte Cristo Area Sheep Allotments for several decades via term grazing permit(s). The four allotments have been managed as sheep allotments for several decades.

Term grazing permits are generally valid for 10 years from the date of issuance. Compliance with the National Environmental Policy Act (NEPA) is required when permits are issued (or re-issued). Section 504 (b) of Public Law 104-19 provides: *“Notwithstanding any other law, term grazing permits which expire or are waived before the NEPA analysis and decision pursuant to the schedule developed by individual Forest Service System units, shall be issued on the same terms and conditions and for the full term of the expired or waived permit. Upon completion of the scheduled NEPA analysis and decision for the allotment, the terms and conditions of existing grazing permits may be modified or re-issued, if necessary to conform to such NEPA analysis.”* Grazing on the Monte Cristo Area Sheep Allotments is being managed accordance with this direction.

Grazing is currently authorized on these four sheep allotments under existing permits and is managed per their respective Allotment Management Plans (AMPs). Each year, specific direction is provided in the Annual Operating Instructions (AOIs) for each allotment. Reauthorization of livestock grazing would require reviewing and updating existing AMPs as necessary.

Table 1.1 Summary of current grazing on each of the four allotments.

Allotment	NFS Acres ²	Livestock Number-Class	Period of Use ³	Grazing System
Blake Hollow	4,050	1000 - ewe/lamb	7/1-9/30 (for 70 days)	4 Pasture Deferred Rotation
Bountiful	6,265	800 - ewe/lamb	7/1-9/30 (for 80 days)	8 Pasture Rest Rotation
Dry Bread	1,910	1150 - ewe/lamb	7/1-9/15 (for 65 days)	4 Pasture Deferred Rotation
Little Monte	4,170	1000 - ewe/lamb	7/1-9/30 (for 70 days)	4 Pasture Deferred Rotation

² From WCNF Corporate GIS layer. Acres are approximate and are not exact.

³ The period of use is specified in the grazing permit as a number of consecutive days within the grazing season for that allotment (i.e. for Blake Hollow, the permitted season is any consecutive 70 days between 7/1 and 9/30 each year).

1.3 Purpose and Need

The purpose is to authorize livestock (sheep) grazing in a manner that would meet or move towards the desired conditions defined in the Forest Plan, Wasatch-Cache National Forest (see Section 1.5). This analysis would comply with Section 504 of Public Law 104-19 to schedule and complete NEPA analyses on allotments where needed to authorize permitted grazing activity.

Grazing is a sustainable use of National Forest System (NFS) lands and is permissible through the Multiple Use Sustained Yield Act of 1960, as amended. The Monte Cristo Area Sheep Allotments lie within the Bear, Cache-Box Elder, and North Wasatch-Ogden

Valley Management Areas and contain lands considered capable and suited for domestic livestock grazing. (FEIS for the Forest Plan, pg. B9-2; Forest Plan, pg. 4-126, 4-137, and 4-149) Continued domestic livestock grazing is consistent with the goals, objectives and guidelines of the Forest Plan.

It is Forest Service policy to make forage available to qualified livestock operators from lands suitable for grazing consistent with land management plans (FSM 2203.1; 36 CFR 222.2(c)).

It is Forest Service policy to continue contributions to the economic and social well being of people by providing opportunities for economic diversity and by promoting stability for communities that depend on the range resource for their livelihood. (FSM 2202.1)

The Forest Plan, which directs the management of lands encompassing the project area, has as one of its desired conditions to permit livestock grazing use within active allotments and to recognize the importance of permitted grazing on the national forest to local agricultural communities, maintenance of open space, and the western ranching lifestyle (pg. 4-126).

1.4 Proposed Action

The Forest Service proposes to authorize continued grazing of sheep on the Monte Cristo Area Sheep Allotments at a level and in a manner consistent with the direction in the Forest Plan (see Section 1.5), and other applicable laws and regulations. The proposed action recognizes the need for forage production from Forest Service administered lands as identified in the Forest Plan.

Field data suggests current grazing management is meeting or moving towards desired conditions as stated in the Forest Plan and refined for this project area (see Section 2.4.2.1) on the majority of rangelands within each of the allotments. Current management would continue in the four Monte Cristo sheep allotments (see Table 1.1). A few isolated areas of concern (i.e., upland areas associated with sheep bed grounds) will be addressed through permit administration.

The proposed action would employ an adaptive management strategy (see Section 2.4.2) which allows for adjusting the timing, intensity, frequency and management of grazing as needed to meet Forest Plan standards and guidelines. Monitoring would determine the need and frequency for administrative adjustments in the timing, intensity, frequency, and/or management of grazing.

Preliminary soils reports indicate ground cover is meeting or exceeding Forest Plan standards of 85% of potential on the majority of all of these allotments. A review of the hydrologic and aquatic features during the summers of 2008/09 indicates that current livestock grazing has had little impact on the water resources within the allotments (see Sections 3.5 and 3.7). No long-term adverse effects to streambanks, water quality, or aquatic habitats were noted during the reviews. A review of range monitoring indicates the apparent rangeland conditions on the majority of each of the allotments are

satisfactory as indicated by adequate ground cover and variety in species composition across the allotments (see Section 3.3).

1.5 Forest Plan Direction

The Forest Plan sets forth direction for managing the land and resources of the Wasatch-Cache National Forest, and describes management goals and objectives, resource protection methods, and desired resource conditions. The Forest Plan is the result of programmatic analysis, which is addressed in the FEIS for the Revised Forest Plan (RFP) (USFS 2003).

The Monte Cristo Area Sheep Allotments environmental analysis is a project-level analysis; its scope is confined to addressing the significant issues and possible environmental consequences of the project. Where appropriate, this analysis will tier to the Forest Plan FEIS, as encouraged by 40 CFR 1502.20.

This analysis identifies site-specific desired conditions for the project area and compares them against the existing conditions. Identification of resource management needs is then the comparison of desired conditions with existing conditions to determine the extent and rate at which current management is meeting or moving toward those desired conditions. Where a particular existing condition and desired condition are the same, there is no need for change. Conversely, where an existing condition and a desired condition are not the same, there is a need for change.

1.5.1 Management Prescriptions

Management Prescriptions Categories provide a general sense of the management or treatment of the land intended to result in a particular condition being achieved or set of values being restored or maintained. These categories are just one part of the total management direction that includes goals, objectives, desired future conditions, standards and guidelines, and monitoring requirements. The Forest Plan management prescription allocations within which the allotment is located include Management Prescriptions 1.5 (Recommended Wilderness), 3.1W (Watershed Emphasis), 3.2D (Terrestrial Habitat Emphasis-Development allowed), 3.2U (Terrestrial Habitat Emphasis-Undeveloped), and 4.4 (Dispersed Motorized Emphasis). Within these management prescriptions, livestock grazing is allowed on open allotments to meet site-specifically defined desired conditions.

1.5.2 Management Areas

The Monte Cristo Area Sheep Allotments are within the Bear, Cache-Box Elder, and North Wasatch-Ogden Valley Management Areas as defined in the Forest Plan.

1.5.3 Desired Future Conditions

Desired future conditions (DFC) are described at both the Forest level (RFP, pages 4-5 through 4-15) and for each management area. Desired conditions for the management areas applicable to the Monte Cristo Sheep allotments are found in the Forest Plan as follows: Bear Management Area (RFP, pages 4-119 through 4-127), Cache-Box Elder Management Area (RFP pages 4-128 through 4-138), and North Wasatch-Ogden Valley (RFP pages 4-140 through 4-150). In accordance with direction in the Forest Plan (RFP,

Appendix X-5), the interdisciplinary team (ID Team) has reviewed and in some cases refined or supplemented the Revised Forest Plan prescribed DFC to be more specific to the project area and the proposed action. The refinements/supplements are consistent with the Forest Plan prescribed DFCs, and are outlined in the Table 2.4.2.1. In order to be meeting or moving toward desired future conditions, a majority of the key areas must be meeting or exceeding the requirement listed.

1.5.4 Standards and Guidelines

The Forest Plan (pages 4-36 thru 4-56, and pages 4-58 thru 4-78) contains standards and guidelines including some applicable to livestock grazing. Those pertinent to these allotments and this environmental analysis are summarized in Section 2.5 of this environmental assessment.

1.6 Decision to be Made

The Ogden District Ranger, as the Responsible Official, will decide whether or not to authorize grazing on the Monte Cristo Area Sheep Allotments and if so, under what conditions (design features, mitigation, monitoring). If continued grazing is authorized, the allotment management plan (AMP) will be revised to incorporate and implement the decision. The AMP will be completed and approved as soon as practical after the NEPA process is completed.

1.7 Public Involvement

In March 2009, a Forest interdisciplinary team met to develop proposed actions and to identify preliminary issues, concerns and measures to carry forward into the analysis. The proposal was provided to the public and other agencies during scoping in March, 2009. The project was included in the Spring 2009 Schedule of Proposed Actions (SOPA). Three comment letters were received during scoping. Using comments received during scoping the Forest refined the list of issues and concerns to address. The issues, proposed action, and alternative were further developed and in July 2009 were provided to the public and other agencies for notice and comment. A legal notice was placed in the Ogden Standard Examiner on July 3, 2009, identifying the beginning of the 30-day comment period. Three written letters and one oral comment were received during the formal comment period. The response to these comments can be found in the EA, Chapter 4, Response to Comments.

1.8 Issues

The ID Team identified the following issues from scoping to be pertinent to this environmental analysis. These issues were used to guide the formulation of alternatives and provide a framework for the effects analysis to be documented in the environmental assessment.

- Sheep grazing and bedding in uplands can cause ineffective ground cover resulting in accelerated soil erosion and degradation of soil quality.

- Sheep grazing can cause changes in plant composition and plant community structure, including potentially affecting threatened, endangered, or Forest Service sensitive species.
- Sheep grazing can decrease cover and forage used by a variety of wildlife species. Potentially affected species include USFWS-listed Threatened, Endangered, Proposed and Candidate species; Forest Service Sensitive species; Wasatch-Cache National Forest Management Indicator Species (MIS), migratory birds, and general species of local concern.
- Sheep grazing can affect the quality of the recreation experience due to the presence of livestock during recreation visits; some recreationists enjoy seeing livestock, others prefer not to see them while on recreation outings.

1.9 Other Disclosures

Evaluation of the proposed action indicated effects on the following would not vary between alternatives and/or there would be very little to no effect on these resources. Therefore, the following are not covered in detail in the EA, but are discussed briefly below to add to the overall understanding of the proposed action. Technical reports with additional information are available in the project record.

1.9.1 Rare Plants

Threatened, Endangered, Proposed, Candidate Plant Species

According to the U.S. Fish and Wildlife Service (Utah Field Office) March 2009 *List of Endangered, Threatened, Proposed, and Candidate Species for Utah Counties* (available in the project record), there are two Threatened (T) plant species found in Weber and Cache County: Maguire's primrose (*Primula maguirei*) and Ute ladies' tresses (*Spiranthes diluvialis*).

- **Maguire's Primrose**

Maguire's primrose occurs on damp ledges and shaded crevices along canyon walls in coniferous forests. It occurs mainly on north and east facing moss-covered cliffs belonging to the Lake Town/Fish Haven dolomitic limestones, but also occurs on open slopes on soils derived from this geologic formation. This species occurs from 4,800 to 6,600 feet in elevation. This species is known only in Logan Canyon and its immediate side drainages on the Logan Ranger District in Cache County. It is not found in or near the Monte Cristo Area Sheep Allotments.

- **Ute Ladies' Tresses**

Ute ladies' tresses occurs along streams, bogs, and open seepage areas in cottonwood, tamarisk, willow, and pinyon/juniper communities at elevations ranging from 4,400 to 6,810 feet. Historic populations of this species found along the Jordan River in Salt Lake County, several miles from the Forest, have not been relocated. The species exists on the Uinta National Forest to the south. However, surveys conducted in potential habitat on the Monte Cristo Area Sheep Allotments have not resulted in the location of any populations of the Ute ladies' tresses.

Since neither of these plant species is found in the project area, there will be no direct, indirect, or cumulative impact on them and they will not be discussed further in the EA.

Forest Service Sensitive Plants

A number of Forest Service Sensitive species were considered during this environmental assessment: tower mustard (*Arabis glabra* var. *furcatipilis*) (Recommended Sensitive); Brownie ladyslipper(*Cypripedium fasciculatum*); Maguire draba (*Draba maguirei*); Burke draba (*Draba burkei*); Cronquist daisy (*Erigeron cronquistii*); Logan buckwheat (*Eriogonum brevicaule* var. *loganum*); Mt. Naomi Penstemon (*Penstemon compactus*); and Starveling milkvetch (*Astragalus jejunus* var. *jejunus*). Although extensive surveys have not located any new populations of rare plants, it is possible these species may exist within the Monte Cristo Area Sheep Allotments.

Animal activities, both domestic and wild, may impact populations of plant species by herbivory and/or trampling. These plants can also be negatively affected by a variety of human activities, including impacts associated with unauthorized off highway vehicle (OHV) use, hiking, camping, picnicking and other activities that cause people to congregate in unique areas for long durations.

For those species listed above that have potential habitat within the project area and in habitats that may be utilized by sheep for either grazing or bedding, the proposed action may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species. Since there will be no difference between alternatives and population viability will be maintained in either case, sensitive plant species will not be addressed further in the EA.

1.9.2 Noxious Weeds

Noxious weeds are generally designated as such because they have the potential for negative effects on agriculture, economics, or ecosystems, and are usually not so abundant that eradication is infeasible. Noxious designation has legal ramifications for interstate transport, nursery stock inspections, and seed certifications.

Noxious weeds infest small portions of these allotments. The project area was included in a noxious weed inventory Utah State University did for the Forest in 2006-2008. Based on that inventory, less than 15 acres total between all four allotments were identified as being infested with noxious weeds (GIS analysis of Forest Noxious Weed Infestation data). The Monte Cristo Area Sheep Allotments have 60 known infestations comprising less than 15 acres of weeds, which is less than 0.05% of the allotted acres. It is important to note that there is no single large, contiguous infestation of any one species. The acres infested are comprised of numerous small infestations scattered throughout the landscape.

Transport by wind, vehicles, clothing or animals are all mechanisms for noxious weed dispersal into new habitats. For this reason noxious weed invasions due to recreational activities and permitted uses are a primary concern of managers. All of the species have multiple vectors of seed dispersal, including wild and domestic animals.

All weed species will be treated according to the 2005 WCNF Noxious Weed Management EIS. In recent years the Uinta-Wasatch-Cache NF and the Ogden Ranger

District have increased efforts in treatment of noxious weeds by hiring weed crews and becoming involved with local Cooperative Weed Management Associations. These increased efforts will continue across both the No Action and the Proposed Action alternatives. Therefore, noxious weeds will not be discussed further in the EA.

1.9.3 Inventoried Roadless Areas

The Upper South Fork roadless area is located within and immediately south of the Monte Cristo Area Sheep Allotments. Portions of the Little Monte, Dry Bread and Bountiful Allotments include about 4,760 acres of the 17,000 acre roadless area. The bulk of the roadless area is the land south to Causey Reservoir.

Appendix C2 of the Final Environment Impact Statement for the Wasatch Cache Revised Forest Plan is a document entitled “Evaluation of Roadless Area Values and Analysis of Effects of Individual Roadless Areas.” Every roadless area on the Forest was evaluated according the roadless values that the area possessed. The Upper South Fork roadless area was evaluated as a “medium to high value” roadless area (FEIS, Appendix C2, p. 37). This area was assigned a management prescription of 1.5 Recommended Wilderness in the Forest Plan. This prescription precludes many management activities, but grazing is allowed.

The effects of livestock grazing on wilderness attributes and roadless area characteristics are limited. Roadless characteristics include soil, water, diversity of plant and animal communities, habitat for TES and species dependant on large undisturbed blocks of land, primitive and semi-primitive non-motorized and motorized recreation, reference landscapes for research, study and interpretation, landscape character and scenic integrity, traditional cultural properties and sacred sites and other identified unique conditions. Of these, grazing has the potential to alter natural landscapes, disturb habitat, and change native plant and animal communities.

In general, neither the proposed action nor the no action alternative would have any measurable effect on the roadless area values as disclosed in the water resources, vegetation, aquatic species, wildlife, and recreation sections of this EA (see Chapter 3). Effects to the condition and structure of vegetation diversity would be isolated and non-significant under the proposed action. Grazing is not affecting other roadless values and would not affect wilderness suitability. Both the proposed action and the no action would maintain roadless values and wilderness attributes. There would be no measurable effect to roadless areas, and therefore, inventoried roadless areas will not be discussed further in the EA.

1.9.4 Heritage Resources

Heritage resources were not identified in scoping as a key issue. However, in addition to review under NEPA, Section 106 of the National Historic Preservation Act (NHPA), as implemented by 36 CFR Part 800, requires Federal agencies to take into account the effects of their undertakings on historic properties. Historic properties are defined as archeological sites, standing structures, or other historic resources listed in or determined eligible for listing in the National Register of Historic Places. For purposes of analysis of

potential effects to heritage resources, the area of potential effect (APE) for this project is the Monte Cristo Area Sheep Allotments.

Class I and II cultural resource surveys and investigations have been conducted for a number of Uinta-Wasatch-Cache National Forest range allotments. With the exception of site 42TO2699, located in the Stansbury Mountain Range, The USFS investigations did not identify adverse effects to significant cultural resources related to livestock grazing on Forest managed lands (Cultural Resource Report No. U-08-FS-1127f (WS-08-804) 2008).

Based on the results of the previous cultural resource inventories, the UWCNF made the determination that the proposed authorization of grazing will result in No Adverse Effect to Historic Properties per 36CFR 800.5(b). The Utah State Historic Preservation Office concurred with this determination in a letter dated December 8, 2008 and recommended no further action. Therefore, regardless of the alternative selected, there is no anticipated adverse effect to heritage resources in the area.

1.9.5 Air Quality

Forest Plan Forestwide Goal 1 for air resources states: Ensure National Forest management activities result in meeting state and federal air quality standards, and comply with local, state and federal air quality regulations and requirements.

Air quality in and around the area is high due to the relative isolation from urban centers, limited access, good vegetative ground cover, and the large scale of the analysis area. Currently, the air quality in the project area is within the standards and guidelines of the Forest Plan.

Activities resulting from this grazing project will not significantly affect the factors contributing to a high quality air shed. Therefore, grazing will not have direct, indirect, or cumulative effects on the resources in this airshed.

1.9.6 Environmental Justice

Environmental justice (EJ) is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Toward attaining EJ for all communities and persons in the United States, Executive Order 12898 (February 11, 1994) directed all Federal agencies to evaluate their proposed actions to determine the potential for disproportionate adverse impacts to minority and low-income populations.

In the memorandum to heads of departments and agencies that accompanied Executive Order 12898, the President specifically recognized the importance of procedures under NEPA for identifying and addressing environmental justice concerns. The memorandum states that “each Federal agency shall analyze the environmental effects, including human health, economic and social effects, of Federal actions, including effects on minority communities and low-income communities, when such analysis is required by [NEPA].”

Implementation of either of the alternatives evaluated in this EA would not result in adverse impacts to environmental resources and socioeconomic conditions. Therefore, disproportionate direct, indirect or cumulative adverse impacts on low income or minority populations would not occur.

Chapter 2 – Alternatives

2.1 Introduction

This chapter describes the formulation of the proposed action and alternatives and discusses alternatives considered but not analyzed in detail. It also summarizes the environmental impacts of the proposed action and the alternative to it, including associated mitigation measures.

2.2 Formulation of Alternatives

NEPA regulations require that agencies should “vigorously explore and objectively evaluate all reasonable alternatives” to the proposed action. The alternatives should achieve the same or similar purpose as the proposed action and should address issues raised and include appropriate mitigation measures not already included in the proposed action. Alternatives that would not be reasonable, either because they do not meet the purpose and need or because of other considerations, may be eliminated from detailed study. A brief discussion of the reasons for their having been eliminated is given.

The Forest Service ID Team evaluated the proposed action in consideration of the relevant issues. Alternatives to the proposed action addressing the relevant issues were developed. If alternatives were identified which were not applicable, they were recorded but not analyzed in detail (see Section 2.3 below).

2.3 Alternatives Considered and Eliminated from Detailed Analysis

Using Sheep to Control Dyer’s Woad

A suggestion was made that the Forest Service reduce the occurrence of the invasive weed Dyer’s Woad (*Isatis tinctoria* L.) within the allotments by using sheep as a principal component of an integrated weed control program. Sheep grazing on the plant in early summer prior to seed set and foraging in the fall on the basal rosette can be an effective control. It would require earlier access to pasture in the spring.

This alternative was raised in a scoping comment for consideration by the ID team. After ID team consideration it was dismissed from detailed study. Because this strategy could be incorporated into adaptive management it was not considered as an alternative to consider in detail.

2.4 Alternatives Considered in Detail

This section describes two alternatives considered in detail. The alternatives analyzed include the required “No Action”, which analyzes a no grazing alternative, and the “Proposed Action”, which represents the current management including an adaptive management component.

2.4.1 Alternative 1 - No Action (No Grazing)

The “no action” alternative is included to meet requirements of the National Environmental Policy Act [40 CFR 1502.14 (d)] and the Grazing Permit Administration Handbook, FSH 2209.13, Chapter 90, Section 92.31 which stipulates that “in addition to the proposed action, the no action alternative shall always be fully developed and analyzed in detail.” “No action” is synonymous with “no grazing” and means that livestock grazing would not be authorized within the project area.

Under this alternative, livestock would no longer be permitted to graze on the Monte Cristo Area Sheep Allotments. If this alternative were selected, grazing would not be authorized after a two-year notification to the permittee from the date the decision is made. Non-permitted recreational horse use would still occur.

2.4.2 Alternative 2 - Proposed Action (Current Management)

Under this alternative, no substantial changes would be made to the current grazing management on the Monte Cristo Area Sheep Allotments. The allotments would continue to be managed in accordance with the direction of the Forest Plan standards and guidelines described in Section 2.5 of this document.

The proposed action includes an adaptive management strategy which allows for adjustments in grazing strategy and infrastructure as needed to respond to changes in field conditions and trends, if so indicated through monitoring.

2.4.2.1 Details of the Proposed Action

The proposed action employs an adaptive management strategy which would adjust the timing, intensity, frequency and management of grazing on the allotment as needed to 1) meet Forest Plan standards and guidelines, and 2) continue to meet or satisfactorily move forest resources toward desired conditions and meet Forest Plan objectives. Monitoring would determine the need and frequency for administrative adjustments in the timing, intensity, frequency, and/or management of grazing. The following sections of this document outline site-specific management principles, limits and direction for the proposed action.

Site-Specific Desired Future Conditions

Desired conditions for the management areas applicable to the Monte Cristo Sheep Allotments are found in the Forest Plan as follows: Bear Management Area (pages 4-119 through 4-127), Cache-Box Elder Management Area (pages 4-128 through 4-138), and North Wasatch-Ogden Valley (pages 4-140 through 4-150). In accordance with direction in the Forest Plan (see Forest Plan Appendix X-5), the interdisciplinary team (ID Team) has reviewed and in some cases refined or supplemented the Forest Plan prescribed DFC to be more specific to the project area and the proposed action. The refinements/supplements are consistent with the Forest Plan prescribed DFCs, and are outlined in the following table:

Table 2.4.2.1: Additional Site-Specific Desired Conditions

Resource Ecosystem Community Type	Applicable Component of the Forest Plan Prescribed Desired Future Condition	Additional Site-Specific Desired Condition
Soil productivity	<p>Most soils have at least minimal protective ground cover. Soils have adequate physical properties for vegetative growth and soil-hydrologic function. Degradation of soil quality and loss of soil productivity is prevented. Soil productivity, quality, and function are restored where adversely impaired and contributing to an overall decline in watershed condition.</p>	<p>Minimal protective ground cover is defined by Forest Plan standard S7 as at least 85% of potential. In tall forb communities minimum ground cover is defined by Guideline G14 as at least 90% of potential. (see S7 and G14 in Section 2.5 of this EA).</p> <p>The Forest Plan (p. VII-1) identifies the following minimum ground covers (85% of potential) for some of the vegetative types in the project area:</p> <ul style="list-style-type: none"> • 76-82% silver sagebrush • 69-82% in few-flowered-sagebrush • 59% in low sagebrush • 78% in snowberry • 60-70% in curleaf mountain mahogany • 77-83% in aspen <p>Applying the direction above, the ID team determined that for this allotment the desired condition is to maintain at least the following average ground covers (% of potential) in vegetation communities impacted by livestock grazing:</p> <ul style="list-style-type: none"> • 78% in aspen, silver sagebrush and mountain brush communities. • 69% in few-flowered sagebrush • 60% in low sagebrush and curleaf mountain mahogany • 73% in mountain big sagebrush (potential is 81 to 96%; as reported in the North Rich Allotment FEIS potential there was 86%. The potential for these communities on these allotments is similar). • 85% in mesic riparian vegetation types.
Riparian areas	<p>Riparian areas have a range of vegetative structural stages that are at or moving toward properly functioning condition, provide a transitional zone between upland terrestrial habitats and aquatic habitats, and have the features necessary to promote stable stream channels and diverse habitat conditions. Desirable riparian vegetation occupies the historical floodplain. Riparian areas provide for fish, wildlife, and water quality requirements.</p>	<p>In accordance with Forest Plan direction (USFS 2003, LRMP p. VII-3) the ID Team has identified the following Class I riparian areas for the project area: perennial segments of Big Spring Creek, Silvia Hollow and Sleepy Gulch.</p> <p>The Class I riparian area listed in the Forest Plan for this area is: Wheatgrass (USFS 2003, LRMP p. VII-7). Although Wheatgrass is located in this area, there are no Class I riparian segments located within the project area.</p> <p>No Class II riparian areas within the</p>

Resource Ecosystem Community Type	Applicable Component of the Forest Plan Prescribed Desired Future Condition	Additional Site-Specific Desired Condition
		<p>project area are identified in the Forest Plan (USFS 2003, p. VII-7).</p> <p>In accordance with Forest Plan direction (p. VII-3), the ID Team has identified the following Class II riparian areas: Intermittent reaches in streams in Silvia Hollow, Big Spring, Sleepy Gulch and Frost Canyon.</p> <p>All riparian areas not identified above as Class I or II are Class III riparian areas.</p>
Springs and wetlands	Spring sources and associated wetlands in the Cache-Box Elder Management Area will be protected from excessive use and will be restored to proper functioning. Riparian areas will be protected from overuse and trampling from livestock grazing and recreation uses. Spring sources will be fenced and provide water for livestock.	<p>Existing livestock spring/wetland protection fences will be maintained in order to protect vegetation, water quality and habitat associated with these areas.</p> <p>Riparian areas will have adequate deep-rooted vegetation or armoring along banks to allow for sediment filtering and erosion prevention.</p> <p>Proper function of wetlands and riparian areas associated with springs will be maintained to meet or exceed conditions outlined in Forest Plan standards and guidelines S24, S25, S26, G4 and G7 (see Section 2.5 below).</p>
Aquatic Habitats	Habitats will be managed to maintain cool, clear water and well-vegetated stream banks for cover and bank stability. Cool water temperatures will be preserved through well-vegetated banks.	<p>Undisturbed stream banks exist on at least 80% of Class I riparian areas.</p> <p>Pool-riffle ratios are approximately 1:1 in fish-bearing streams.</p> <p>Summer water temperatures in fish-bearing streams do not exceed 20°C.</p>
Aspen	Associated herbaceous and woody vegetation is in aspen communities is highly variable and is dominated by desired perennial grasses and forbs with a range of shrub cover.	At least 10% of the understory cover in aspen communities is comprised of desired tall forb species ² .

² Plant species listed as moderate or high value rating for erosion control/watershed protection in the Region 4 Forest Service Handbook 2209.21 – Range Management Resource Value Ratings Guide.

Resource Ecosystem Community Type	Applicable Component of the Forest Plan Prescribed Desired Future Condition	Additional Site-Specific Desired Condition
Upland vegetation and big game winter range	<p>Maintain upland (sagebrush, mountain brush, grassland) plant communities are dominated by desired perennial grasses, forbs, and have a range of shrub cover. Associated herbaceous and woody vegetation provides for plant communities that are diverse in seral status and structure and provide food and habitat for wildlife, forage for livestock, and a variety of recreational opportunities and aesthetic values.</p>	<p>A wide variety of sagebrush cover closures exist, with a maximum closure of 35%. Most (greater than 50%) vegetation cover in sagebrush stands are desired grass and forb species</p> <p>A variety of shrubs such as snowberry, serviceberry, chokecherry, and elderberry are present in mountain brush communities.</p>
Riparian vegetation	<p>Riparian areas have a mix of seral and climax vegetation that is at or approaching PFC. Trees, willows, dogwood, birch, alder, sedges, rushes and hydric grasses, depending on stream substrate, gradient, and elevation, dominate riparian areas. These areas provide healthy self-perpetuating plant communities.</p> <p>Riparian plant habitats and rare riparian species will be protected from trampling and overuse by livestock grazing and recreational uses.</p>	<p>Adequate vegetative cover (as defined by the heights prescribed in Forest Plan standards S24 and S25) provide filtering of runoff, protection of the soil, and habitat for wildlife in riparian areas.</p> <p>Riparian shrub and trees are perpetuated by retaining at least 50% of annual growth of these plants (i.e., as provided for in Forest Plan standard S26 [see Section 2.5 of this EA]).</p>
Rangeland/Livestock Grazing	<p>Livestock grazing is a permitted use. Grazing levels will be adjusted and managed with up-to-date Allotment Management Plans (AMPs). AMPs prescribing rest and deferred rotation grazing systems and riparian pastures will be in place. Structural improvements such as fences and water developments will be constructed or reconstructed and maintained to improve animal distribution and control. Structural improvements that are not needed will be removed from the forest. Grazing permit holders will move livestock as needed to meet management objectives for the ground. Ongoing ecosystem monitoring will be used to refine standards.</p>	<p>Grazing levels will be adjusted and managed with an up-to-date Allotment Management Plan (AMP) that prescribes grazing systems and establishes management that ensures the time and timing of grazing is altered annually. When and/or if needed, structural improvements such as fences and water developments will be constructed or reconstructed and maintained, to improve animal distribution and control.</p>

Resource Ecosystem Community Type	Applicable Component of the Forest Plan Prescribed Desired Future Condition	Additional Site-Specific Desired Condition
	Permit holders will share responsibility with the Forest Service for monitoring use, and will hold full responsibility for movement and control of livestock. Excess and unauthorized livestock use will be minimal. The number of term grazing permits will be reduced by the formation of grazing associations and the issuance of grazing agreements instead of individual permits.	

Grazing Season

The specific grazing season would vary from year to year, but would generally occur between July 1st and September 30th. Turnout would not occur before *range readiness*—that point in the plant growth cycle at which grazing may begin without permanent damage to vegetation or soil (Heady and Child, 1994). The grazing season would generally end before the start of the rifle deer and elk hunting season. Annual adjustments would normally be authorized by the District Ranger in the Annual Operating Instructions (AOI’s).

Grazing Strategy

Livestock grazing would incorporate a grazing management system, such as deferred grazing and/or other adaptive management strategies (see Adaptive Management section) that ensures the time and timing of grazing use is altered on an annual basis. Grazing on portions of each allotment would be deferred annually until after seed ripe. Rest rotation would continue on one of the eight pastures in the Bountiful allotment.

Intensity

The intensity of grazing (utilization) would be according to grazing utilization standards and guidelines described in the Forest Plan. The applicable standards for grazing use under the proposed action would be as described in Section 2.5.

Annual forage utilization is measured by averaging the use of key species in key areas based on the measurement of typically 50 to 100 individual plants. Key areas are defined as “a relatively small portion of rangeland which because of its location, grazing or browsing value and/or use, serves as a monitoring and evaluation site” (FSH 2209.21). Key areas will be established in Grass/Shrubland, Aspen, and in Riparian areas. No key areas will be established in Conifer, Juniper, or Oak/Maple vegetation types because they are not grazed and are a minor component of the allotment. The proposed action identifies the following “key areas” (at a minimum) to be monitored for annual utilization and long-term trend:

- 1) Big Spring Fork (Riparian)
- 2) Dry Bread Pond (Aspen)
- 3) Hatch Springs (Sagebrush/Mountain Brush)
- 4) Little Monte (Tall Forb/Grassland)
- 5) Harriet Springs (Sagebrush)

Frequency

The frequency of grazing any certain area will be one time per season. Sheep would not be allowed to re-graze either upland or riparian sites where utilization had already been met. This means that sheep would be managed to ensure that grazing of re-growth of native species during the same grazing season does not occur.

Adaptive Management

Adaptive management involves identification of future management options that may be needed to accelerate or adjust management decisions to meet desired conditions and/or project standards and objectives, as the need is determined through monitoring. Building adaptive management flexibility into management allows for decisions that are responsive to needed adjustments in permitted actions (FSH 2209.13 Section 92.23b).

Adaptive management strategies

Implementation of the proposed action would include an adaptive management strategy. If monitoring indicates changes are needed, other adaptive management strategies to achieve the objectives of the proposed action would include:

Livestock Grazing Management Actions¹

Use of salt or supplement to draw livestock toward or away from specific areas.

Change season of use.

Change animal numbers.

Change animal class.

Change number of days of livestock utilization.

Rest from livestock grazing for one or more seasons.

Construct fence² to create riparian unit and allow livestock grazing under riparian grazing guidelines.

Construct fence² to exclude livestock from areas of concern (riparian, streams, springs, wetlands, mesic meadows, etc.).

Construct temporary electric fence or permanent fence² to control livestock distribution patterns.

Construct livestock water development² (pipeline, tanks, windmill, sediment traps, well, stock dam, submersible pumps, solar).

Remove existing water development (pipeline, tanks, windmill, well, stock dam).

Remove existing fence line (electric, standard, permanent or temporary).

Implement multi-pasture, deferred livestock grazing system.

Livestock Grazing Management Actions¹

Implement a high-intensity/short duration livestock grazing system (by riding, herding, temporary fence, etc.).

Implement rest-rotation livestock grazing system.

¹ The potential management actions are designed to be used either alone or in combination to best meet, or at least, move toward the desired resource condition within a timeframe of ten years.

² Other than those listed in the design criteria, permanent fences and stock tank installations would not be constructed without additional NEPA analysis.

2.5 Mitigation and Management Requirements

Mitigation measures, Best Management Practices (BMPs), and Forest-wide standards and guidelines included in all action alternatives are listed below. Research and information substantiating these requirements are found in the Forest Plan and FEIS (USFS 2003).

2.5.1 Management Requirements

The Forest Plan (USFS 2003, p. 4-36 thru 4-56 and 4-58 thru 4-78) contains standards and guidelines (see LRMP, p. 3-36 for definition of these 2 terms) including some applicable to livestock grazing. Those pertinent to the project area and this environmental analysis are summarized in the following tables:

Table 2.5a: Forest Plan (LRMP) Standards (S) that apply to this project.

(S4) Place new sources of chemical and pathogenic pollutants where such pollutants will not reach surface or ground water. (LRMP, p. 4-36)		
(S7) Allow management activities to result in no less than 85% of potential ground cover for each vegetation cover type. (LRMP, p. 4-37). (See LRMP, Appendix VII for potential ground cover values by cover type).		
(S24) As a tool to achieve desired conditions of the land, maximum forage utilization standards for vegetation types in satisfactory condition using traditional grazing systems (rest rotation, deferred rotation, season long) are as follows:		
Table S24: Percent utilization of key grass or grass like vegetation, by vegetation type, for rangelands in satisfactory condition.		
Vegetation Type	Condition	Percent Utilization of Key Grasses or Grass-Like
Upland and Aspen	Satisfactory	50%
Crested Wheatgrass	Satisfactory	60%
Riparian* Class I	Satisfactory	50%
Riparian* Class II & III	Satisfactory	60%
* Riparian, away from greenline		
(S25) As a tool to achieve desired conditions of riparian areas, maximum forage utilization standards (stubble height) for low to mid elevation <i>greenline</i> species in Class I, II, and III riparian areas (see Appendix VII) in satisfactory condition are as follows: (Key species being grazed include water sedge, Nebraska sedge, and and/or wooly sedge.)		
Table S25: Greenline stubble height at the end of the growing season, by riparian class, for rangeland satisfactory condition.		

Vegetation Type	Condition	Greenline Stubble Height at End of Growing Season
Riparian Class I	Satisfactory	No less than 5"
Riparian Class II	Satisfactory	No less than 4"
Riparian Class III	Satisfactory	No less than 3"

(S26) For all rangelands, including big game winter range and riparian areas, permit no more than 50% of the current year’s growth on woody vegetation to be browsed during one growth cycle (i.e., when use has reached 50% allow no additional livestock use). (LRMP, p. 4-52)

Table 2.5b: Wasatch-Cache NF Guidelines (G) that apply to this project.

(G3) Proposed actions analyzed under NEPA should adhere to the State Nonpoint Source Management Plan to best achieve consistency with both Sections 313 and 319 of the Federal Water Pollution Control Act. (LRMP, p. 4-37)
(G4) At the end of an activity, allow no more than 15% of an activity area to have detrimental soil displacement, puddling, compaction and/or to be severely burned. (LRMP, p. 4-37)
(G7) Manage Class 1 Riparian Area Greenlines for 70% or more late-seral vegetation communities as described in Intermountain Region Integrated Riparian Evaluation Guide (USFS, 1992). Manage Class 2 Riparian Area Greenlines for 60% or more late-seral vegetation communities. Manage Class 3 Riparian Area Greenlines for 40% or more late-seral vegetation communities. (LRMP, p. 4-37)
(G9) Avoid soil disturbing activities (those that remove surface organic matter exposing mineral soil) on steep, erosive, and unstable slopes, and in riparian, wetlands, floodplains, wet meadows, and alpine areas. (LRMP, p. 4-38)
(G11) Use Best Management Practices & Soil & Water Conservation Practices during project assessment/ implementation to ensure maintenance of soil productivity, minimization of sediment discharge into streams, lakes and wetlands to protect designated beneficial uses (LRMP 4-38)
(G12) Locate new actions (such as incident bases, fire suppression camps, staging areas, livestock handling facilities, recreation facilities, roads and improvements) outside of Riparian Habitat Conservation Areas. If the only suitable location for such actions is within Riparian Habitat Conservation Areas, sites will be located to minimize resource impacts (LRMP, p. 4-38)
(G14) Manage vegetation for properly functioning condition at the landscape scale. Desired structure and pattern for cover types of the Wasatch-Cache National Forest (from USFS 1996) ... are as follows ... (USFS 2003, LRMP p. 4-39 thru 4-42)

Table G14. Desired Structure and Pattern for Cover Types

Cover Type	Landscape Structure	Landscape Patterns
Aspen	<u>Balanced Range:</u> Grass/Forb and Seedling/Sapling = 40 % Young, Mid Aged and Mature forests = 30% Old Forests = 30% Stand Density Index > 300 and Basal Area < 140.	Patterns are within historical ranges. Pattern sizes, shapes and corridors are maintaining processes. The role of fire is to influence distribution of structural classes and patterns across landscapes.
Pinyon-Juniper	<u>Guideline direction for this cover type is not shown here as this cover type is not applicable in this project area.</u>	
Mountain Mahogany	<u>Guideline direction for this cover type is not shown here as this cover type is not applicable in this project area.</u>	

Tall Shrub (Mountain Brush)	Multiple vegetation layers with alternating vertical dominance.	Acreages and dispersion within historical ranges.
Sagebrush(Big)/Grassland	Balanced range of structural stages. 40% of area with 15% or more crown cover (as measured by line intercept method).	Patterns are within the historical range.
Riparian	Amount and type of vegetation types present that maintain riparian-dependent resources and provide a high rate of recovery following disturbance.	Plant community type compositions and accompanying riparian ecosystem functions maintain proper ground water recharge, storage, delivery, water tables, channel morphology and bank stability.
(G15) In goshawk habitat, design management activities to maintain, restore, or protect desired goshawk and goshawk prey habitats including foraging, nesting, and movement. (LRMP, p. 4-42)		
(G23) Avoid actions on the Forest that reduce the viability of any population of plant species classified as Threatened, Endangered, Sensitive or recommended sensitive. Use management actions to protect habitats of plant species at risk from adverse modification or destruction. For species that naturally occur in sites with some disturbance, maintain the appropriate level of disturbance. (LRMP, p. 4-43)		
(G71) As a tool to achieve rehabilitation of upland, aspen, and riparian communities away from the greenline that are not meeting or moving toward objectives, maximum allowed forage utilization will be 30-40%.(LRMP, p. 4-52)		
(G72) Modify grazing practices that prevent attainment of desired future conditions for vegetation and/or aquatic resources. (LRMP, p. 4-52)		
(G75) Annual operating instructions (and/or Allotment Management Plans) should be evaluated and additional site-specific objectives defined if needed for any or all of the following five parameters: <ul style="list-style-type: none"> ▪ stubble height on selected key species on the greenline, ▪ stubble height on selected key species and/or the amount of bare ▪ ground within the riparian zone but away from the greenline, riparian woody browse utilization (trees and shrubs), ▪ stream bank trampling on key reaches, and ▪ stubble height and/or incidence of use on key species in the uplands. (LRMP, p. 4-52) 		
(G2.6-2) Grazing is allowed on open allotments to meet site-specifically defined desired conditions. (LRMP, p. 4-67)		
(G3.1A-2) Livestock grazing is allowed with the utilization standard for Riparian Class 1, and to meet site-specifically developed desired conditions. (LRMP, p. 4-69)		
(G4.4-2) Grazing is allowed on open allotments to meet site-specifically defined desired conditions. (LRMP, p. 4-69)		

2.6 Monitoring Activities

The following monitoring activities would be conducted by the Forest Service to evaluate range conditions and to ensure compliance with the grazing permit and management requirements listed above.

(1) Livestock management

What: Monitor livestock distribution to ensure livestock are in areas authorized for grazing.

Why: To protect unauthorized areas from livestock grazing to help achieve desired conditions.

How often: Throughout the grazing season

How the results will be used: Information would be documented and shared with the permittees to ensure livestock are in the proper locations. If livestock are found in an unauthorized area it would be considered non-compliance and appropriate administrative action would be taken according to Forest Service Handbook direction (FSH 2209.13, Chapter 10, section 16).

(2) Annual upland and riparian utilization and use

What: Annual monitoring will include collecting and recording the following information:

- a. Utilization on upland and riparian key areas, including:
 - 1) Big Spring Fork (Riparian)
 - 2) Dry Bread Pond (Aspen)
 - 3) Hatch Springs (Sagebrush/Mountain Brush)
 - 4) Little Monte (Tall Forb/Grassland)
 - 5) Harriet Springs (Sagebrush)

Why: To maintain proper livestock distribution and ensure utilization standards are not exceeded, in order to maintain satisfactory conditions, improve unsatisfactory conditions, and help move toward desired conditions.

How often: Utilization and livestock distribution during and at the end of the grazing season.

How the results will be used: The information will be used to determine when livestock must be moved from one area to another or off the allotment after all areas have been grazed, and to make any necessary adjustments to numbers and/or season of use.

(3) Long-term upland condition and trend

What: Long-term trend monitoring will be conducted on some of the previously established long-term study sites. Additional sites may be determined through field assessment.

Why: To evaluate vegetation conditions and identify whether or not they are at or moving toward desired conditions in riparian and upland areas.

How often: About every 10 years.

How the results will be used: Information will be used to determine if the area is meeting or moving toward desired conditions. Long-term trend data will be used to evaluate timing, intensity, frequency and management of grazing. As necessary, annual triggers affecting the timing, intensity, frequency and management of grazing would be adjusted to meet long-term desired resource conditions.

(4) Riparian area/water/aquatic habitats

What: Multiple Indicators Monitoring System (MIMS)

Why: To ensure that riparian environments are protected from trampling and vegetation loss and that water quality and aquatic habitats are maintained.

How often: About every 5-10 years.

How the results will be used: The information will be used to evaluate movement toward desired conditions in riparian areas. If monitoring indicates that degraded riparian areas are developing and/or existing degraded riparian areas have not improved in condition (using indicators such as increased riparian vegetation diversity and structure, streambank disturbance, and channel width) then an alternative management strategy such as fencing key riparian areas would be implemented. Fencing would require further NEPA analysis on the site-specific environmental effects of the fencing.

2.7 Comparison of Alternatives

Table 2.7 Comparison of differences among Alternative 1 (No Action - No Grazing), and Alternative 2 (Proposed Action - Current Management)

	Alternative 1 (No Action - No Grazing)	Alternative 2 (Proposed Action - Current Management)
Permitted Numbers	Same as Alternative 2 until grazing is eliminated from the allotment, then no grazing	Blake Hollow - 1000 ewe/lamb Bountiful – 800 ewe/lamb Dry Bread – 1150 ewe/lamb Little Monte – 1000 ewe/lamb
Grazing System	No grazing	Blake Hollow – 4 Pasture Deferred Rotation Bountiful – 8 Pasture Rest Rotation Dry Bread –4 Pasture Deferred Rotation Little Monte –4 Pasture Deferred Rotation
Grazing Season	Same as Alternative 2 until grazing is eliminated, then no grazing	Blake Hollow –7/1-9/30 (70 days) Bountiful –7/1-9/30 (80 days) Dry Bread –7/1-9/15 (65 days) Little Monte –7/1–9/30 (70 days)
Utilization	Same as Alternative 2, until grazing is eliminated, then no grazing	50 percent use on uplands in satisfactory condition; 30-40 % use on uplands in unsatisfactory condition; riparian greenline stubble heights at the end of the growing season of 4-5 inches on Class 2 riparian areas and 5-6 inches on Class 1 riparian areas

2.8 Comparison of Effects of Alternatives

Table 2.8 Comparison of the effects of Alternative 1 (No Grazing) and Alternative 2 (Proposed Action)

Issue	Alternative 1 (No Grazing)	Alternative 2 (Proposed Action)
Aquatic Species and their Habitat	<p>For the Bonneville cutthroat trout a determination of “no impact” was made.</p> <p>Fish populations in Wheeler Creek and Big Spring Fork will continue to persist in the long-term.</p>	<p>For the Bonneville cutthroat trout a determination of “may impact individuals or habitat, but will not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species” was made.</p> <p>Grazing has little effect on the tiger salamanders found on the allotments. Strong populations would continue to exist in water features within the allotments.</p>
Rangeland Vegetation	<p>The condition of the upland vegetation across all four allotments is expected to continue to improve slowly.</p>	<p>Upland and riparian communities that are in satisfactory condition would remain in satisfactory condition. Riparian browse would continue to be utilized and would not become decadent and unpalatable, but would remain in a similar satisfactory condition as today. Areas that have already crossed a threshold, such as historic bed grounds covered by Mule’s Ear would require additional restoration</p>
Recreation Experience	<p>Recreation experiences would improve after grazing is eliminated, for those who do not like to see or interact with sheep while on recreation outings.</p>	<p>Recreation experiences may improve for those individuals who do not like to see or interact with sheep through varying timing and reducing livestock use in Dry Bread area and during hunting season.</p>
Soil Quality and Condition	<p>Ground cover will slowly increase in most vegetation communities utilized by domestic livestock. Improvements to soil quality would not be noticeably enhanced.</p>	<p>Continuing grazing management results in very little impact to vegetative ground cover, soil erosion rates, and soil porosity and compaction.</p>

Issue	Alternative 1 (No Grazing)	Alternative 2 (Proposed Action)
Water Resources	Very little change to stream channel morphology and vegetative conditions along riparian areas with the removal of sheep. Very little improvement to water quality. Very little change to wetlands.	Very little of the stream channel is affected by sheep grazing as indicated by only a few sheep trails seen accessing water along Big Spring creek. Very little effect to water quality due to sheep grazing because there are very few areas that have low ground cover. Trampling occurs mainly around ponds created for sheep watering not along streams and seeps. The effect from sheep grazing to floodplains and municipal watersheds is very low. All of these conditions are expected to continue.
Threatened, Endangered, Proposed, and Candidate Wildlife Species and Their Habitats	For lynx, elimination of grazing would result in the greatest positive effect on available forage and cover and prey species abundance and diversity.	A finding of “may affect individuals, but is not likely to adversely affect the lynx or its habitat” has been given for the lynx. A finding of “no effect” has been given for the yellow-billed cuckoo.
Wildlife Management Indicator Species (MIS) and Their Habitats	The potential for small mammal diversity and overall species abundance is improved because grazing would be eliminated under this alternative.	The effects on MIS species (northern goshawk and snowshoe hare) are related to effects on small mammals. Small mammal diversity and overall species abundance may improve slightly over existing condition. Beaver numbers are not likely to change from current condition for any of the alternatives.
Sensitive Wildlife Species and Their Habitat	Potential effects to habitat for sensitive species are related to potential effects on their prey species. Potential effects to prey species and their habitat would be slightly improved over other alternatives as grazing is eliminated from the allotment.	For sensitive species a finding of “may impact individuals or habitat, but will not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species” is given for the northern goshawk, greater sage grouse and flammulated owl. A finding of no impact is given to western big-eared bat, three toed woodpecker, wolverine, Columbian sharp-tailed grouse, boreal owls, and great gray owl. No habitat in project area for spotted bat, Rocky Mtn bighorn sheep, peregrine falcon, and bald eagle,

Page intentionally left blank

Chapter 3 – Affected Environment and Environmental Consequences

Chapter 3 provides a summary of the affected environment including the physical, biological, and social-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. The section is organized by resource. Within each section, the affected environment is briefly described, followed by the environmental consequences (effects) of implementing each alternative.

3.1 Introduction

The Monte Cristo Area Sheep Allotments are at the eastern edge of the Wasatch Mountain Range, in Cache, Weber, and Rich Counties. The allotments generally feature rolling mountains and long ridges, cut by moderately steep drainages. Much of the terrain in the allotments is covered by aspen forest and sage/grasslands, with conifer forest covering the rest. The area’s vertebrate, aquatic, and plant life has been studied extensively by Forest biologists. Motorized and non-motorized recreation, including ATV-riding, dispersed camping, and hunting, are popular activities in the Monte Cristo area.

3.1.1 List of Past, Present, and Reasonable Foreseeable Future Actions

Table 3.1 shows the actions considered in the cumulative effects disclosure within each resource section in Chapter 3. Past, present, and on-going activities have resulted in the resource’s existing condition. Reasonably foreseeable future actions are also considered. As applicable to each resource, these conditions, actions, and effects are described in Chapter 3.

Table 3.1 Past, present and ongoing, and reasonably foreseeable activities within the analysis area

PAST ACTIONS		
<i>Action</i>	Description	Date
Livestock Grazing	Historic sheep grazing	1800s-early 1900s
Vegetation Treatments	Monte Cristo Aspen Regeneration Project was started in 2002, and has resulted in several small controlled burns to encourage aspen regeneration.	2002
Riparian Fencing	Wheeler Springs riparian area was fenced off (to exclude livestock use)	2005
PRESENT AND ONGOING ACTIONS		
Action	Description	Date
Livestock Grazing	Cattle grazing on the Monte Cristo sheep allotments and the adjacent Woodruff-Dairy Ridge cattle allotments. Also livestock grazing on adjacent private lands to the west of the allotments and to the east of the	On-going

	allotments is ongoing.	
Private Property	Private lands are located to the east and west of the sheep allotments.	On-going
Roads and Trails; Motorized Recreation Use and Dispersed Camping Use	The most recent Travel Plan for the Ogden District was approved in 2007. There are a few roads designated as open in this area. Roads not open in the Travel Plan continue to be decommissioned through road obliteration, seeding, and signing. Unauthorized use of closed roads and trails continues to occur. There are a number of high-value dispersed camping sites along roads. Dispersed camping along with ATV use in the Dry Bread Concentrated Use Area is very popular. There are only 0.5 miles of non-motorized trail. Horseback riding, big game hunting, and camping continue to occur.	On-going
Fire Suppression	Active fire suppression of human-caused fires. Lightning fires within wildland fire use consideration areas may be managed as wildland fire use	Ongoing
Noxious Weeds Treatment	Treatment of noxious weeds according to the WCNF Noxious Weed EIS/ROD	Ongoing
REASONABLY FORESEEABLE ACTIONS		
<i>Action</i>	Description	Date
Sagebrush Treatment	Dairy Ridge mechanical treatment and/or prescribed fire of 600 acres of decadent sagebrush growth have been proposed for areas on the sheep allotments.	Specific future date TBD
Riparian Protection Fence	A riparian protection fence is being considered in Silvia Hollow, to address the cattle trespass from the adjacent Dairy Ridge cattle allotment.	Specific future date TBD
Ruby Pipeline	A 42" natural gas pipeline crosses 1.2 miles on the Blake Allotment	2011

3.2 Aquatic Resources

3.2.1 Affected Environment

Stream Habitat Conditions - Site visits to Silvia Hollow, Wheeler Creek, and Big Spring Fork in August and October of 2008, found stream conditions in good condition along Wheeler, Big Spring Fork and most of Silvia Hollow as indicated by the dense, deep-rooted vegetation such as willows and sedges. Large cobbles and boulders also helped stabilize much of this area. Little to no bank disturbance attributed to sheep grazing was observed. However, riparian conditions along portions of Silvia Hollow from Wheeler Creek to William Spring were poor (bare stream-banks, heavy utilization of remaining vegetation). Grazing of cattle from adjacent areas (see cumulative effects) is believed to be a contributing factor to these conditions. Currently, the allotment boundary fence between the Bountiful and Dairy Ridge Allotments is in poor condition.

Habitat information collected in 2006 during sampling for aquatic Management Indicator Species (MIS) sampling found good/improving conditions at Wheeler Creek. The

recently completed riparian fencing project here has led to improved bank stability, reduced sedimentation and more willow. A large beaver complex located along the creek has also improved Bonneville cutthroat trout (BCT) habitat.

A total of 4.5 miles of streams within these allotments support fish, all of which occur in Management Prescription 3.1a. Strong populations of tiger salamanders were identified at a number of water features within the project area. No known boreal toad breeding sites occur on these allotments.

3.2.1.1 Threatened, Endangered, and Sensitive Aquatic Species - According to the U.S. Fish and Wildlife Service (Utah Field Office) March 2009 *List of Endangered, Threatened, Proposed, and Candidate Species for Utah Counties* (available in the project record), no threatened or endangered aquatic species occur within Counties on the Wasatch-Cache National Forest.

The Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*), Bonneville cutthroat trout (*Oncorhynchus clarki utah*), and the Columbia spotted frog (*Rana luteiventris*) are the aquatic sensitive species listed for the Wasatch-Cache National Forest. Neither Colorado River Cutthroat trout nor Columbia Spotted Frog is found on the Ogden Ranger District. The Bonneville cutthroat trout is also a Forest Management Indicator Species and is covered in that section below.

3.2.1.2 Management Indicator Species - Bonneville cutthroat trout are one of two aquatic species identified as management indicator species (MIS) in the Wasatch-Cache National Forest Plan. As the aquatic management indicator present on the allotments, BCT will be used to represent effects of livestock grazing for other aquatic species including macro-invertebrates and mollusks.

The Woodruff Drainage (including three streams within the project area: Wheeler Creek/Silvia Hollow, Big Spring Fork, and Sleepy Gulch) supports a strong population of Bonneville cutthroat trout (known as the Woodruff Metapopulation). Sections of stream located on Forest are important for spawning and rearing for BCT with a limited amount of use by resident fish. Populations in Wheeler Creek, Silvia Hollow, and Big Spring Fork were last monitored in 2006 as part of the Forest MIS monitoring protocol.

Based on the two data points collected at the monitoring station in Wheeler Creek, the Bonneville cutthroat trout population in this portion of the stream was smaller in 2006 as compared to 2000, while size and condition factor were up slightly.

The 2006 stream survey completed on Silvia Hollow resulted in the capture of no fish. Spot-shocking above and below the monitoring station also failed to capture any fish. A large natural debris dam located below the monitoring station appears to be preventing spawning adult BCT from reaching this site. A limited portion of Silvia Hollow maintains perennial flows during drought years and it was utilized as spawning and rearing habitat in 2000 for a limited number of juvenile BCT.

Based on the two data points collected at the monitoring station in Big Spring Fork, the Bonneville cutthroat trout population in this portion of the stream was larger in 2006 as compared to 2000; size and condition factor were also up slightly.

Although BCT populations decreased between the 2000 and 2006 samples in Silvia Hollow and Wheeler Creek, the Woodruff Metapopulation remains strong. The reduction in BCT numbers and biomass are likely attributed to effects of the drought that occurred since the last sampling in 2000. Young of Year (YOY) and age 1+ fish were abundant at all three sample sites where fish were captured, indicating that this population is functioning well.

Habitat conditions in Wheeler Creek are improving, especially within areas of the riparian fencing. While no fish were observed in Silvia Hollow in 2006 due to a natural debris dam blocking migrating adults, this will have a limited effect on the overall population. In addition, habitat conditions along most of Silvia Hollow remain in good condition and will likely be utilized by BCT once they can navigate past the natural debris dam. Livestock exclosures have been constructed around portions of these streams and water troughs have been installed to encourage cattle to utilize vegetation away from riparian areas.

Additional information on MIS trends for the Forest can be found in the annual report, Management Indicator Species of the Wasatch-Cache National Forest (Uinta-Wasatch-Cache National Forest, 2008) available in the project record.

3.2.2 Environmental Consequences

Generally speaking, when livestock graze within riparian corridors, water quality, stream channel morphology, hydrology, riparian soils, vegetation, and fish and invertebrate diversity, abundance, and distribution will be altered. However, the degree of impact is highly variable depending on historic land uses (timber harvest, grazing, mining, road building, etc.), existing habitat conditions, watershed characteristics (stream gradient, meadow versus forest, hydrologic regime (volume, source, timing, etc.), and geologic composition/history), and current livestock practices (number of sheep, route, duration, etc.). It is important to note that the degree of impact is also highly variable both spatially and temporarily. Furthermore, most of these impacts are intertwined. For example, trampling of banks resulting in increased erosion can result in numerous impacts to fish including loss of juvenile and adult refugia, loss of pool habitat, reduction in spawning gravel quality due to increased fines, and increased water temperature.

Alternative 1, No Action (No Grazing)

The implementation of the No Action alternative will result in sheep grazing being phased out over a 2-year period after notice of cancellation. As a result, impacts associated with grazing will be temporary (0-3 years). Direct and indirect effects and cumulative effects associated with Alternative 1 are similar across allotments. Therefore, these effects are summarized and have not been segmented by allotment.

It is expected that very little change will occur to wetlands or water quality because there is very little indication that erosion and sedimentation is occurring from current sheep

grazing. Fish populations in Wheeler Creek and Big Spring Fork will continue to persist in the long-term with natural population fluctuations occurring. Bonneville cutthroat trout are likely to utilize Silvia Hollow in the future as access improves past a natural debris dam in the drainage.

If the decision is made to discontinue grazing under this Alternative, this project would have the effect of “**no impact**” for Bonneville cutthroat trout.

Alternative 2, Proposed Action (Current Management)

Implementation of the Proposed Action alternative will maintain existing conditions along streams outside riparian protection fences in their current good condition. Some trampling of stream banks and wetlands will continue to occur in small specific areas. In areas located within riparian protection fencing (Wheeler Creek), habitat conditions will continue to improve. The effects to aquatic resources from the proposed action will be the continuance of grazing management that results in very little impact to stream banks, or aquatic species. Due to the limited amount of stream, no perennial stream crossings were identified and limited grazing occurs along these streams. Impacts like those observed around Upper Dry Bread Pond can be addressed in the annual operating plan. Baseline conditions currently functioning appropriately will likely continue to function appropriately. Several measures included in Section 2.5 and in recent Annual Operating Instructions (AOIs) should be maintained, including:

- Minimum stubble height restrictions and maximum use restrictions on riparian communities;
- Maximum use restrictions on woody riparian vegetation;
- Limits on streambank trampling;
- Maximum use restrictions on upland vegetation

Under this alternative, all aquatic related standards and guidelines in the Revised Forest Plan will be met. However, impacts to fisheries and other aquatic species will continue at some level at least as long as grazing occurred and as such would constitute a long-term (>15 years) impact to aquatic resources.

Overall, if the decision is made to continue grazing this project would have the effect of “**may impact individuals but not likely to cause a trend to federal listing or a loss of viability**” for Bonneville cutthroat trout. The Woodruff Drainage would continue to support a viable meta-population of Bonneville cutthroat trout and other aquatic species. The Proposed Alternative would not affect the trend of the population.

It appears that sheep grazing has had little effect on tiger salamanders. In the case of tiger salamanders, water developments in the form of stockponds likely provide additional habitat. Due to the proximity of these allotments to known sites of boreal toad populations, combined with the mobility of boreal toad, it is likely that individuals utilize the proposed project area infrequently. If a boreal toad were to encounter a band of sheep, trampling could occur.

3.2.3 Cumulative Effects

The cumulative effects area for this analysis is the Woodruff Drainage (above Woodruff Reservoir) to the North and East, and the allotment boundaries to the West and South. Several other activities occur within this analysis area that has the potential to affect aquatic resources mainly by decreasing streambank stability and increasing sedimentation. These other activities include: recreation (ATV riding, hiking, fishing, and camping), livestock grazing in areas adjacent to these allotments, vegetation management, implementation of the revised Ogden Travel Plan and riparian protection fencing.

Increasing Recreational Use of the Allotments

Recreational activities of various kinds span the allotments, and recreational use is increasing as the resident and visitor populations grow. The assessment of cumulative effects on recreational resources notes that this high level of recreational use is generating notable impacts on natural resources as well as on recreation itself. These include impacts on riparian areas due to establishment of dispersed camp sites and user-developed roads accessing these sites, unauthorized ATV use, and general foot, horse, and vehicle traffic. This use intersects and contributes cumulatively to similar impacts due to grazing. In localized areas, where grazing overlaps with recreational use, this cumulative impact can be noticeable (such as at Upper Dry Bread Pond). However, the Ogden Ranger District has been actively enforcing the revised Ogden Travel Plan by closing user created roads/trails and managing recreational use on designated routes within the Proposed Project Area.

Livestock Grazing

Livestock grazing occurs in most areas surrounding these allotments including privately owned lands. Like grazing within these allotments, most is managed well although some trespass occurs. This trespass has had little effect to erosion and sedimentation. One exception occurs along portions of Silvia Hollow. This stream is near the allotment boundary between the Bountiful sheep allotment and the Dairy Ridge cattle allotment. Concentrated use by cattle along perennial flowing sections of this stream have reduced riparian vegetation and increased sedimentation. This situation is currently being addressed in the analysis of the Woodruff and Dairy Ridge allotments.

Vegetation Management

Several vegetation management projects have been or are planned or have been implemented within the project area. Aspen treatment projects such as those included in the Monte Cristo Aspen Regeneration project included mitigation to protect area streams and aquatic resources. No aquatic impacts have been identified from the portion of the project that has been implemented. Additional burn units may be treated in the future. However, based on the identified mitigation and results from past treatments, no impacts are anticipated.

The Dairy Ridge Sagebrush Treatment Project is a recently proposed project that would occur on the Woodruff/Dairy Ridge allotments. The project is designed to use prescribed fire or mechanically treat sagebrush in the uplands. Due to the distance from water,

timing, and mitigation identified no impacts to aquatic resources are anticipated if this project is implemented.

Riparian Protection Fencing

Several riparian protection fences have been constructed in and adjacent to the Monte Cristo sheep allotments. The fencing completed around Wheeler Creek has improved riparian habitat conditions and stream conditions. In 2008, fences and offsite watering were installed in Ranger Hollow around the stream and spring sources (Dairy Ridge cattle allotment). Ranger Hollow flows seasonally into Wheeler Creek and this should add additional protection to this stream.

3.3 Rangeland Resources

3.3.1 Affected Environment

The Monte Cristo Area Sheep Allotments total approximately 16,400 acres. Vegetation within these allotments is composed predominately of aspen and grass/shrub communities, and conifer forests. The following table denotes the mix of vegetation types across the allotments.

Table 3.2 Approximate Acres of Vegetation Types by Allotment

Vegetation Type	Blake Hollow Total Habitat Acres	Dry Bread Total Habitat Acres	Little Monte Total Habitat Acres	Bountiful Total Habitat Acres	TOTAL Habitat Acres
Conifer Forest	792	22	272	1,352	2,438 (15%)
Grass/Shrubland	591	216	1,095	1,089	2,991 (18%)
Aspen Forest	2,645	1,620	2,793	3,775	10,833 (66%)
Juniper	20	0	0	0	20 (0.1%)
Oak/Maple	0	50	10	49	109 (1%)
Total Acres	4,050¹	1,910¹	4,170¹	6,265¹	16,395

¹ Total acres are approximate and may not equal total habitat type acres as some less prevalent vegetation cover types are not included in table.

3.3.1.1 Range Condition and Trend

Numerous studies have been read over the years across the project area to determine condition and trend. The upland vegetation of all four sheep allotments in the project area is generally in satisfactory condition and trends are stable to upward. A few small areas scattered across each of the allotments are not meeting desired conditions. These areas are mostly historic sheep bedding grounds where early-seral forb species such as Mule’s Ear form small monocultures or have reduced ground cover.

Bountiful Allotment- Data from site analysis inventories and other studies conducted in the 1960s and 1970s compared to recent monitoring indicate that range conditions are improved over those that existed 30-40 years ago. The recent data indicates species composition is good with a majority of the species rated moderate to high value for

watershed protection using the region's resource value ratings. Ground cover, comprised of vegetation, litter, rock, and moss is meeting Forest Plan standards at all but one study site: Hatch Springs. This site is located near a hilltop on a sheep bedding ground. Ground cover is not meeting Forest Plan standards here; however the study seems to be poorly located. It is not representative of the rest of the allotment, as indicated by the majority of other studies where ground cover is exceeding Forest Plan standards. Current rangeland monitoring indicates conditions on the allotment are generally satisfactory and trends are stable to upward.

Little Monte- In the 1950's, trend studies were established at a number of sites across this allotment, with additional site analysis inventories conducted in 1960. When compared with historic data, recent information collected from these study sites shows improvement of species composition. The majority of the species rated moderate to high value for watershed protection using the region's resource value ratings. Undesirable forbs such as *Rudbeckia* have decreased while desirable grasses and forbs have increased. Ground cover, comprised of vegetation, litter, rock, and moss is stable and is meeting Forest Plan standards. Current rangeland monitoring indicates conditions on the allotment are generally satisfactory and trends are stable to upward.

Dry Bread- In the 1960's, site analysis inventories were conducted across the allotment. Recent studies from 1995, 2002, 2008, and 2009 indicate improvement to species composition. The majority of the species rated moderate to high value for watershed protection using the region's resource value ratings. Forbs are starting to increase in frequency and indicate that the tall forb community is in an upward trend. Ground cover, comprised of vegetation, litter, rock, and moss is stable and is meeting Forest Plan standards. Current rangeland monitoring indicates conditions on the allotment are generally satisfactory and trending upward.

Blake Hollow- A number of site analysis inventories was conducted in this allotment in the 1960s and again in 1980. Additional trend sites were established in the 1990s and 2000s. The recent data indicates improvement to species composition. The majority of the species rated moderate to high value for watershed protection using the region's resource value ratings. Ground cover, comprised of vegetation, litter, rock, and moss is stable and is meeting Forest Plan standards. Current rangeland monitoring indicates conditions on the allotment are generally satisfactory and trends are stable to upward.

3.3.1.2 Grazing Suitability and Capacity

The tentative grazing capacity as determined by the 1960's range allotment analysis showed about 13,861 acres capable and suitable for livestock grazing on the four allotments in the project area. Range capability was mapped again as part of the 2003 revision of the Wasatch-Cache National Forest Land and Resource Management Plan. This mapping used the Intermountain Region's protocols (see LRMP FEIS, Appendix B9). Criteria used to identify capable rangelands in the 1960's were similar, but slightly different than those used in the analysis for the Forest Plan (e.g., the 1960's analysis included sites producing at least 50 pounds/acre/year of forage, whereas the Forest Plan included sites producing at least 200 pounds/acre/year of forage). As part of this environmental analysis, the Forest Plan capability analysis was reviewed using currently available site-specific data. This review validated the Forest Plan capability and

suitability analysis. About 13,283 acres were found capable and suitable. Mapping accuracy and allotment boundary changes account for the majority of the differences between the two inventories.

Table 3.3 Rangeland Capable Acres

CAPABLE ACRES		
Allotment	Forest Plan (2003)	REA (1960s)
	Acres	Acres
Blake Hollow	2965	3797
Bountiful	4792	4764
Little Monte	3702	3585
Dry Bread	1824	1715
TOTAL	13283	13861

In a June 18, 2008 letter (available in the project file), Forest Service Director of Range Management Janette Kaiser notes how current thinking on use of forage factors to set range capacity has evolved: “the use of forage factors is generally only pertinent when stocking a range where there has been no livestock use or where there has been extensive management with little to no monitoring.” Director Kaiser also noted: “Proper stocking rates are site-specific thus they can be highly variable. Key factors influencing proper stocking on any given parcel of land include, but are not limited to: permittee management knowledge and effectiveness, topography, water availability, plant communities and their distribution, aspect, slope, forage palatability, current year’s precipitation and seasonal distribution, fire (both wild and prescribed), drought, wildlife effects, recreational activities, livestock age and size, and so forth. The bottom line is that for any given allotment, proper stocking rates can and will vary depending on these types of variables. Generally, we define the range of variability for proper stocking rates, but it is nearly impossible to pinpoint one “proper stocking rate”. ... “The Forest Service focuses its management on the land and vegetation rather than just on livestock needs. That is, for any given allotment, desired conditions are set. Then, criteria are established, based on the best available scientific information, which are designed to meet or adequately move the allotment toward desired conditions.”

The Forest Service uses forage utilization monitoring to validate stocking rates and make adjustments when necessary. Utilization standards are developed to ensure plant vigor and productivity is maintained and/or improved. Forage utilization monitoring is the basis for making adjustments in management or stocking rates. If livestock use is consistently within forage utilization levels and soils and vegetation conditions and trends are acceptable (i.e., generally stable or moving toward desired conditions), then stocking is considered to be within capacity. If livestock use results in having to consistently accelerate the scheduled rotations through pastures or requires them to be removed from an allotment early, it is considered to indicate that stocking is outside of capacity and a need for change in the grazing capacity is appropriate. Use becomes self regulating because management is based on meeting plant and other resource needs by meeting design criteria rather than on meeting any prescribed level of use (e.g., so many Animal Units of grazing). When resource needs are not being met by the prescribed utilization

standard, utilization rates are decreased and the new standard is monitored and/or grazing intensity adjusted.

3.3.2 Environmental Consequences

Alternative 1, *No Action (No Grazing)*

With the no grazing alternative, the condition of the upland vegetation across all four allotments is expected to continue to improve slowly. These drier sites tend to take a long time to respond and start to improve. Without further disturbance, brush species would continue to become more decadent and increasingly uniform, while continuing to lose understory herbaceous species. Where a diversity of species still exist, results would be better than in areas that have already crossed a threshold, such as historic bed grounds covered by Mules Ear. These sites would require additional restoration above simply removing livestock to return to a more desirable condition. Reduction or removal of grazing may have little effect on range condition in the intermediate or even long term for many ecosystems in relatively stable, lower successional states (Laycock, 1991).

Riparian areas respond fastest to any management change. Meadows and riparian shrub land health would begin to improve immediately upon the removal of livestock. Overall, the condition of the riparian areas in the project area is satisfactory, but an immediate increase in browse vigor would be noted. This increased vigor may be short lived, however. Without livestock use, some riparian vegetation may become decadent and too coarse or woody for livestock or wildlife use over time.

Through removal of grazing, this alternative would reduce the dispersal and occurrence of noxious weed infestations that would otherwise have been caused by livestock. Many carriers are responsible for noxious weed dispersal, however with the removal of cattle, new noxious weed infestations should decrease.

Alternative 2, *Proposed Action (Current Management)*

Under the proposed action, adaptive management would allow Forest Service personnel and permittees to respond quickly to changing conditions across allotments. Increased flexibility would allow new problems to be corrected the fastest. The Forest Plan utilization and stubble height standards would continue to provide for proper use and ensure plant reproduction and viability while protecting the stream channels and watershed from erosion. Upland and riparian communities that are in satisfactory condition would remain in satisfactory condition in much the same way as the “No Livestock Grazing” Alternative. Riparian browse would continue to be utilized and would not become decadent and unpalatable, but would remain in a similar satisfactory condition as today. Areas that have already crossed a threshold, such as historic bed grounds covered by Mule’s Ear would require additional restoration above simply removing livestock to return to a more desirable condition (Laycock, 1991). Monitoring would continue across the four allotments in the identified key areas. If unsatisfactory conditions or downward trends were found, an adaptive management strategy would be implemented to correct the problem. This would be on a case by case basis.

3.3.3 Cumulative Effects

The cumulative effects area for this analysis is the Woodruff Drainage (above Woodruff Reservoir) to the North and East, and the allotment boundaries to the West and South. Several other activities occur within this analysis area that have the potential to affect rangeland resources. These other activities include: recreation (ATV riding, hiking, fishing, and camping), livestock grazing in areas adjacent to these allotments, and vegetation management projects.

Recreation Use

Heavy recreation use has the potential to affect rangeland vegetation in much the same way as heavy grazing from livestock. Heavy use causing soil compaction reduces desirable vegetative species and has the potential to increase annuals and other weedy species. People disperse noxious weed seeds throughout their travels. Vandalism of range structural improvements is expected to increase as recreational use increases.

Livestock Grazing

Livestock grazing occurs on two adjacent allotments as well as on private land surrounding the project area. Adjacent grazing can affect the rangeland resources in the project area by shifting use from wildlife to areas inside the project area. For example, if nearby private lands are heavily overgrazed, use by wildlife may shift to heavier use inside the project area allotments. Weeds may increase in overgrazed areas adjacent to the project area and can begin to invade across the allotment boundaries.

Vegetation Management

Several vegetation management projects are planned or have been implemented within the project area. Aspen treatment projects such as those included in the Monte Cristo Aspen Regeneration project will affect rangeland vegetation. Rest is required following implementation of any part of the project to ensure positive results. The Dairy Ridge Sagebrush Treatment Project is a recently proposed project that would occur on the Woodruff/Dairy Ridge allotments. The project is designed to use prescribed fire or mechanically treat sagebrush in the uplands. This would benefit the treatment area directly and the adjacent rangelands indirectly by shifting use by wildlife to the more productive newly treated areas.

3.4 Recreation

3.4.1 Affected Environment

The Wasatch-Cache National Forest is recognized as an urban forest, with nearly 1.7 million people living in close proximity to the forest. Recreation is currently the dominant use in the forest (WCNF Forest Plan FEIS, 3-226). The majority of the Ogden Ranger District is within one hour of the Wasatch Front urban center. The primary access route is State Highway 39 up Ogden Canyon and over Monte Cristo. Areas of the forest located along the Wasatch Front are heavily visited and most commonly visited for day-use or short trips. This includes the forest located within the Monte Cristo area.

The Forest Service has used the recreation opportunity spectrum (ROS) since the 1980's as a management tool to describe and allocate outdoor recreation settings. ROS is a key component of management direction in the 2003 Revised Forest Plan. Opportunities, activities, and settings are part of the ROS system. The ROS establishes zones of uses (settings) where allowed activities provide opportunities for visitors to enjoy their public lands and attain desired beneficial experiences. As a tool ROS helps visitors decide which areas, or settings, are the best choice for their desired experience by letting them know what physical, social and managerial settings are available. Providing the information helps visitors choose the best location for their desired activity so they have the best chance of having a quality, satisfying experience.

A variety of recreational opportunities occur within the Monte Cristo Sheep Allotment Area. The analysis area has been classified on the Recreation Opportunity Spectrum as Roaded Natural, Semi-Primitive Non-Motorized and Semi-Primitive Motorized. These three classifications provide the natural, managerial, and social conditions for a variety of recreation activities including, but not limited to, hunting, camping, motorized trail use, non-motorized trail use, and winter snowmobile use.

The settings of these areas are characterized as having a natural appearance with minor improvements to protect resources. Managers provide limited numbers of signs that are rustic looking and made of natural materials. Visitors will expect to meet a low number of other people while traveling the routes. Most information relating to these areas will be located at trailheads with minimal management in the interior of the areas.

The Monte Cristo Township ROS mapping was based on Roaded Natural ROS along either side of State Highway 39 and the entire Dry Bread Concentrated Use dispersed camping area west of the highway; Semi-Primitive Motorized along either side of the Wasatch Ridge (20068), Lightning Ridge (20072), Big Spring (20206), Baldy-Wheeler (20071) roads; and, Semi-Primitive Non-Motorized in the remaining areas. This delineation applies to the Summer Recreation Opportunity Spectrum only.

3.4.2 Environmental Consequences

The key assumptions that are made in this effects analysis for recreation are:

- Livestock will be managed to stay within the allotment boundaries
- Overnight use (camping) is more impacted by grazing than day use
- Some individuals are negatively affected by seeing livestock grazing or their impacts, some are not, and some enjoy seeing cattle grazing

Often when visitor expectations are not met they have a less satisfying experience. Visitors' experiences are often influenced by the conditions of the setting they are in. Some individuals are negatively affected by seeing livestock grazing or their impacts, some are not, and some enjoy seeing livestock grazing. Little is known regarding what experiences visitors are seeking in the Monte Cristo Sheep Allotment project area.

Alternative 1, No Action (No Grazing)

This alternative eliminates livestock grazing on the Monte Cristo Area Sheep Allotments. In general this alternative would provide the greatest improvement to the recreation experience in the Monte Cristo Area Sheep Allotments as there will be no grazing conflicts, no manure in campsites, grazing induced resource impacts would decrease over time and there will not be sheep sharing campsites with Forest visitors along the roads.

Alternative 2, Proposed Action (Current Management)

This alternative would continue the current level of permitted grazing and the current management of the allotments. This alternative incorporates an adaptive management strategy that varies the grazing season, strategy, timing, intensity, frequency and amount of control based on resource conditions and minimizing resource impacts from grazing animals.

During the grazing season, campers' experiences would be affected by sheep in any identified dispersed campsites along the roads and in the Dry Bread concentrated use area campsites and trails. Grazing during the hunting season, usually early October when camping in the Monte Cristo Township is greatest, would have a negative impact on the recreation hunting experience.

3.4.3 Cumulative Effects

The cumulative effects area for this analysis is the Upper South Fork roadless area. The effects from past, on-going, and reasonably foreseeable activities listed in Table 3.1.1, as relates to the overall recreation experience, are minor. The effects of implementing either the Proposed Action or No Action alternative are minor, as described in Section 3.4.2 above. Therefore, the effects of the Proposed Action or No Action alternatives in combination with the effects of past, on-going, and future actions will not have any discernable cumulative effect on the recreation experience in the analysis area.

3.5 Soil Quality and Condition**3.5.1 Affected Environment**

The following section describes the existing conditions (affected environment) of the soil resources within the Monte Cristo Area Sheep Allotments.

3.5.1.1 Existing Soil Quality

Wasatch, Baldy, Lightning, Choke, and Elk Ridges - The ridgelines are natural transportation corridors for wildlife, domestic livestock, and forest recreation users. South and west facing aspects on these ridges have inherently poorer vegetation productivity, as do the peak and knob areas, due to shallow soils and droughty conditions. Nearly every ridgeline has a road or trail on it that is either currently open to use, has been closed to use, or has fallen into disuse and is in the initial stages of re-vegetation. Allotment folder notes indicate that the Wasatch Ridge in particular was used historically as a sheep driveway, although all of the ridges have certainly been used to some extent for this purpose. Concentrated grazing uses have been reduced substantially under current grazing management by the elimination of closed herding/trailing and common cattle/sheep use practices. Restoration treatments have occurred in many locations along

the ridges, and have been met with some success where re-vegetation has been excluded from continued grazing use. However, the ridgelines are still being used for concentrated grazing practices such as salting, bedding, and shading. Small areas of low ground cover, barren of most vegetation except for annual weeds, were observed at scattered locations along the ridges. These scattered areas seem to persist, regardless of changes in grazing strategies and regimes, because soils and vegetation are being continuously impacted by a combination of pocket gopher colonies, big game and domestic grazing, and dispersed recreation uses such as camping and ATV/OHV use.

Sylvia Hollow and Sleepy Hollow - Monitoring of these perennial drainages indicates that they are currently being impacted by cattle use from adjacent areas (see cumulative effects). Key riparian species in these drainages were observed to have been utilized to less than one inch of stubble height. Cattle trespass in Sylvia Hollow is from the Dairy Ridge allotment, as the existing allotment control fences were either left down for this season, or have fallen into disrepair. The source of cattle trespass in Sleepy Hollow was not determined.

3.5.1.2 Soil Condition Evaluation Transects

Field visits were made in 2008 to evaluate ground cover conditions in the Monte Cristo Area Sheep Allotments. Descriptions and maps of transect location, length, and vegetation types are contained in a separate report (Flood, P. 2008a.). Vegetation and litter combined covered from 55 to 86 % of transects sampled. Bare soil associated with gopher activity ranged from 8 to 29% of the transect sample points. A very small amount of the sample points (0 to 8%) contained bare soil that could not be associated with any specific causative agent. Overall, bare soil due to grazing activity ranges from 2% to 15%, which is well within the threshold for the ground cover (Standard S7) in the Forest Plan.

3.5.1.3 Compliance of Existing Soil Conditions with Applicable Revised Forest Plan Standards and Guidelines for Watershed Health

This section analyzes the existing conditions within the 4 sheep allotments for compliance with soil quality related watershed health standards and guidelines in the Wasatch Cache National Forest Revised Forest Plan. These include:

Standard (S7) Allow management activities to result in no less than 85% of potential ground cover for each vegetation cover type. (See Appendix VII for potential ground cover values by cover type.) The RFP intended for this standard to be applied to only Rangeland Cover Types. Ground cover ranges at potential for the range vegetation types found in the allotment pastures are listed in Appendix VII of the Forest Plan (USDA Forest Service, 2003a) and in Tables 4 through 6 of the First Year Forest Plan Monitoring Report (USDA Forest Service, 2004a). Site specific soil quality monitoring of ground cover indicates that current vegetation/litter/rock ground cover conditions range from 68% to 81%. However, a large portion of the observed bare soil conditions were due to gopher activity, and are considered to be an inherent property of this vegetation cover type (Goodrich, S. 2006-PG). Bare soil due to grazing activity ranges from 2% to 15%, which is well within the threshold set in this standard.

Guideline (G4) At the end of an activity, allow no more than 15% of an activity area (defined in Glossary) to have detrimental soil displacement, puddling, compaction and/or to be severely burned. The activity area for analysis of compliance with this guideline is specified here to be the individual pastures which make up each allotment. This guideline is intended to be applied to soil disturbances that result from management activities only. Soil displacement, puddling, compaction, or burning from inherent, natural processes is not considered to be detrimental for the purpose of applying this guideline.

Ground cover transects conducted within the pastures reveal that the primary causative agent in producing disturbed and barren soils is gopher burrowing and casting, an inherent, natural process that can occur anywhere there is a sufficient depth of insulating snow to produce a sub-nivean environment. Because it is a natural feature of these pastures, bare soil produced by this activity should not be considered a detrimental soil disturbance for the purpose of evaluating the effects of proposed management activities.

Bare soil due to grazing activity can result in detrimental soil displacement (erosion) or compaction. Using data from ground cover transects conducted in the pastures, bare soil due to other than gopher activity ranges from 2% to 15 %, which is well within the threshold set in this guideline.

Guideline (G9) Avoid soil disturbing activities (those that remove surface organic matter exposing mineral soil) on steep, erosive, and unstable slopes, and in riparian, wetlands, floodplains, wet meadows, and alpine areas. Unlike other RFP direction, this guideline does not set a numerical threshold for management related soil effects; rather it focuses on avoidance of these effects on sensitive sites.

Unstable slopes are not a common feature in these allotments. Steep and erosive slopes, are found along the lower canyon side slopes in all of the pastures of these allotments. The gradient of some of these slopes exceeds 50%, and as such these areas are not considered to be part of the capable range acres for these allotments. In reality, very little livestock grazing occurs on these very steep landforms.

Guideline (G11) Use Best Management Practices (BMPs) and Soil and Water Conservation practices during project level assessment and implementation to ensure maintenance of soil productivity, minimization of sediment discharge into streams, lakes and wetlands to protect of designated beneficial uses.

BMPs currently prescribed in AOPs and being implemented on these allotments include:

- Open herding of livestock to prevent concentrated use and associated soil disturbances.
- Salting and bedding areas located well away from water sources.
- Utilization guidelines that limit the residence time of livestock in pastures, and prevent concentrated use related soil disturbance.

3.5.2 Environmental Consequences

Alternative 1, No Action (No Grazing)

Utilization of forage in the unsatisfactory range condition areas will be greatly reduced as the complete rest from domestic livestock grazing is implemented. It is expected that ground cover will slowly increase in most of the vegetation communities utilized by domestic livestock. Improvements to soil quality—such as re-accumulation of organic matter lost during historic periods of overgrazing—are already occurring under current grazing management, and would not be noticeably enhanced by the No Action alternative. Increasing diversification of desirable grass and forb species will occur within most of the vegetation communities currently being grazed, and would proceed at approximately the same rate as the recovery of soil quality.

Due to lack of forage and water, little grazing use occurs along the more barren open ridge tall forb cover types. As a result removing grazing from the other vegetation cover types in the allotments will have little noticeable effects on the soil resource in the barren open ridge tall forb cover areas.

The effects of the No Action alternative on soil conditions within riparian areas and along streams are covered within the Watershed section (Section 3.6) of this environmental analysis.

Alternative 2, Proposed Action (Current Management)

In general, the effects to soil resources from the Proposed Action will result in very little impact to vegetative ground cover, soil erosion rates, and soil porosity/compaction. It is expected that standards and guidelines for soil resources will continue to be met.

The effects of the Proposed Action on soil conditions within riparian areas and along streams are covered within the Watershed Effects section of this analysis.

3.5.3 Cumulative Effects

The Council on Environmental Quality define cumulative effects as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonable foreseeable future actions regardless of what agency (Federal or non-Federal) or persons undertakes such actions (40 CFR Section 1508.7)”. The range of alternatives considered must include the no-action alternative as a baseline against which to evaluate cumulative effects. Cumulative effects result from spatial (geographic) and temporal (timing) crowding of environmental perturbations. The effects of human activities will accumulate when a second perturbation occurs at a site before the ecosystem can fully rebound from the effect of the first perturbation (CEQ, 1997).

Cumulative Effects Scope - The scope of the cumulative analysis identifies significant issues, the geographic area, time frame for analysis, and other actions affecting the resources of concern. The significant cumulative effects issue related to soil resources is that certain past, present, and reasonably foreseeable future management activities have the potential to create disturbances to soils. These disturbances could consist of

detrimental amounts of erosion or compaction. The indicator for cumulative effects is the kind and amount of detrimental disturbance observed, predicted, or anticipated from the various types of management activities that have the potential to create disturbances to soils. The geographic area for the analysis of cumulative effects to soils will be the individual activity areas represented by the grazing allotment pastures. The time frame for the analysis of reasonably foreseeable actions is about 10 years, which represents the approximate length of time the proposed action authorizes grazing for. The time frame for the analysis of past actions is about 100 years.

Cumulative Effects Affected Environment - Other actions that may have an influence on soil resources within the cumulative effects analysis area are disclosed in detail in section 3.12, Table 3.1, of the environmental assessment document. Historically, sheep grazing have occurred in the allotments at levels much greater than what is currently being proposed. Recreational activities of various kinds span the allotments, and recreational use is increasing as the resident and visitor populations grow. Riparian fencing to control grazing effects has been implemented in Wheeler Springs area, and is proposed in the Sylvia Hollow area. Small scale prescribed burning of aspen stands has occurred in the allotments, as have noxious weed suppression activities. Although the potential for mechanical or chemical treatments of sagebrush exists, the lack of actual proposals for this activity makes it impossible to analyze the associated cumulative effects at this time.

Determination of Cumulative Effects - Several effects may occur from other activities occurring within the cumulative effects area. Generally, past levels of historic over-grazing may have caused erosion and sedimentation by shearing soil and leaving bare surface soil that can erode during storm events.

The assessment of cumulative effects on recreational resources notes that this high level of recreational use is generating notable impacts on natural resources as well as on recreation itself. Recreation uses create impacts on soil quality associated with the establishment of dispersed camp sites and user-developed ghost roads accessing these sites, legal and illegal ATV use, and general foot, horse, and vehicle traffic. Motorized roads and trails have the potential to erode during storm events that may cause sedimentation of streams if they are close by. Dispersed recreation may cause detrimental amounts of soil disturbance and trampling that could lead to accelerated soil erosion. Recreation uses intersect and contribute cumulatively where similar impacts are occurring due to grazing.

Riparian fencing and prescribed burning activities create a very small amount of soil disturbance while being implemented, and a rapid increase in soil ground cover immediately afterwards. Noxious weed treatments may cause a decrease in total soil ground cover during the season of implementation, and then increasing amounts of more effective ground cover afterwards.

Cumulative Effects of the No Action Alternative

Under this alternative, livestock would no longer be permitted to graze on the Monte Cristo area sheep Allotments. This alternative would have no impact on the current or future levels of recreational use in the allotments.

Sheep and cattle grazing resulted in high impacts to soil resources from the late 1800s until the 1930s when active grazing management took effect in the area. Since then, a gradual improvement in land conditions has occurred as indicated by increased ground cover and absence of active soil erosion in most areas within grazing allotments. Implementation of the no action alternative would have little of no cumulative effects on the gradual improvement of soil quality that has been occurring as a result of past livestock number reductions within most of the upland vegetation communities of the allotment pastures.

Recreation uses are concentrated within the aspen cover types and tall forb open ridge lines of the allotment pastures. The principal effects to soil quality from these features and activities are detrimental amounts of soil compaction and soil erosion. It is anticipated that these effects will increase over time as forest recreation increases in the cumulative effects analysis area. Although not part of the proposed action, closure of non-system roads and trails within the allotments through implementation of the Ogden Ranger District Travel Plan would further reduce the effects. The ranger district has been actively enforcing the revised Ogden Travel Plan, closing user created roads/trails and managing recreational use within the cumulative effects analysis area. Recent examples include closing the Eli Ridge Road and the trail along Silvia Hollow. Implementation of the no action alternative will have little of no cumulative effects on the detrimental soil compaction and erosion that occurs now or in the future as a result of motorized road/trail usage and dispersed recreation activities within most of the upland vegetation communities of the allotment pastures.

Because riparian fencing is designed to exclude livestock grazing, implementation of the no action alternative will have no cumulative effects on soil quality within the fenced areas. In the absence of livestock grazing created by the no action alternative, recovery of grass and forb species could occur more rapidly in sagebrush and aspen communities after these areas are treated.

Cumulative Effects of the Proposed Action

Current grazing activities are having little or no effects upon the soil resources within the most of the upland vegetation communities within the allotment pastures.

Sheep and cattle grazing resulted in high impacts to soil resources from the late 1800s until the 1930s when active grazing management took effect in the area. Since then, a gradual improvement in land conditions has occurred as indicated by increased ground cover and absence of active soil erosion in most areas within grazing allotments. Implementation of the proposed action alternative would have little of no cumulative effects on the gradual improvement of soil quality that has been occurring as a result of past livestock number reductions within most of the upland vegetation communities of the allotment pastures.

Recreation uses are concentrated within the aspen cover types and tall forb open ridge lines of the allotment pastures. The principal effects to soil quality from these features and activities are detrimental amounts of soil compaction and soil erosion. It is anticipated that these effects will increase over time as forest recreation increases in the

cumulative effects analysis area. Although not part of the proposed action, closure of non-system roads and trails within the allotments through implementation of the Ogden Ranger District Travel Plan would further reduce the effects. The ranger district has been actively enforcing the revised Ogden Travel Plan, closing user created roads/trails and managing recreational use within the cumulative effects analysis area. Recent examples include closing the Eli Ridge Road and the trail along Silvia Hollow. Implementation of the proposed action alternative will have little or no cumulative effects on the detrimental soil compaction and erosion that occurs now or in the future as a result of motorized road/trail usage and dispersed recreation activities within most of the upland vegetation communities of the allotment pastures.

Because riparian fencing is designed to exclude livestock grazing, implementation of the proposed action will have no cumulative effects on soil quality within the fenced areas. Unlike cattle, sheep are not drawn to these areas, and would not concentrate along the fence enclosures or cause detrimental soil effects in these areas of the allotments. Although grazing sheep would be drawn to sagebrush and aspen communities after these areas are treated, rest from grazing would be a Best Management Practice that is implemented along with the treatments. Consequently, no cumulative effects are foreseen from the proposed action on the post treatment recovery of grass and forb species.

Irretrievable or Irreversible Commitment of Resources – No irretrievable or irreversible commitment of resources are expected to occur to soil quality from the proposed action of this project because long term impacts to soil resources are expected to occur. No permanent roads will be constructed as part of this project, and all other potential detrimental impacts from soil erosion and compaction can be minimized through the implementation of mitigation measures recommended in this analysis.

3.6 Water Quality and Quantity

3.6.1 Affected Environment

The allotments are located in portions of four watersheds. Almost all of Blake Hollow allotment is located in the headwaters of the Little Bear River watershed (Hydrologic Unit Code 1601020301) and a small portion of the north part is in the Blacksmith Fork watershed (Hydrologic Unit Code 1601020302). The northern third of Dry Bread is in the Little Bear River watershed and the southern two-thirds is in the headwaters of the Ogden River watershed (Hydrologic Unit Code 1602010202). The southeastern two-thirds of Little Monte allotment is in the headwaters of the Ogden River watershed and the northeastern third is in the Woodruff watershed (Hydrologic Unit Code 1601010107). The western quarter of Bountiful allotment is in the headwaters of the Ogden River watershed and the eastern three-quarters is in the Woodruff watershed.

The Blacksmith Fork and the Little Bear Rivers drain into Cache Valley and are diverted into many irrigation canals, and then eventually flow into the Bear River at the upper end of Cutler Reservoir about five miles west of Logan, Utah. The headwaters of the Ogden River flow into Causey Reservoir, then into the South Fork Ogden River which flows into Pineview Reservoir. The Woodruff drainage flows into Woodruff Reservoir and then into several canals that eventually flow into the Bear River.

Stream flows in the project area are primarily influenced by snowmelt. Peak flows generally occur from mid-May to early June and gradually recede to base flows in mid to late August. Base flows continue from this time until April, when temperatures begin to warm. Rainfall from summer storms are generally localized and result in peaks that can exceed snowmelt peaks.

The areas where some accelerated soil movement appears to occur are in areas of poor soil productivity such as in tar weed areas. These areas are in the upper part of the drainages and not near the ephemeral stream channels. There are indications that very little amount of sediment is reaching the stream channels as indicated by one small gully that is located in the upper part of Sleepy Gulch. During the field trip, it did not appear that livestock were the cause of the bare areas and gullies as indicated by lack of trailing and hoof prints in these areas even though sheep had grazed the area.

3.6.1.1 Water Quality

For the waters draining these watersheds, the State of Utah has determined that all assessed classes are meeting the beneficial uses (Utah, State of. 2006b). During the field trips, the water in the streams was clear.

The State of Utah has designated the streams draining the watersheds above the National Forest boundary as Antidegradation Segments. This indicates that the existing water quality is better than the established standards for the designated beneficial uses. Water quality is required by state regulation to be maintained at this level. The beneficial uses of streams within these watersheds, as designated by the Utah Department of Environmental Quality, Division of Water Quality, are:

- Class 2B – protected for recreation
- Class 3A – protected for cold water species of game fish and other cold water aquatic species
- Class 4 – protected for agricultural uses.

The numeric water quality standards can be found in Section R317-2, Utah Administrative Code, *Standards of Quality of Waters of the State* (Utah, State of. 2006a). The State of Utah collected water samples throughout the State of Utah on a regular cycle and analyzed them for chemicals, nutrients, and metals.

3.6.1.2 Precipitation Patterns

In Utah most precipitation occurs from winter snowfall and summer thunderstorm activities. Thunderstorms generally occur as a cloudburst that may drop heavy precipitation along a narrow path (Ashcroft et al. 1992). At Hardware Ranch, average annual precipitation is 17.4 inches, record monthly precipitation ranges from 6.4 in February to 2.9 inches in July. Precipitation in northern Utah occurs as snow in the winter and occasional summer thunderstorms.

3.6.1.3 Drainage Patterns and Water Features

The only perennial streams in the sheep allotments are in Silvia Hollow, below Big Creek Spring, and in Sleepy Gulch. There are no stream gages in the allotments and water discharge is not known. Stream channel widths are about 4 to 8 feet wide in the perennial streams and water depth during the spring-season high flows is probably about 1 foot

high based on the height of the channel banks. From summer to early spring, a low amount of water flows in the perennial streams.

The perennial stream length, lakes or ponds, and springs that are shown on topography maps are presented in the Table 3.4. Only three streams with perennial flows occur within the Bountiful (5.4 miles of perennial stream) and Little Monte (0.14 miles of perennial stream) allotments (Silvia Hollow/Wheeler Creek, Big Spring Fork, and Sleepy Gulch). No streams with perennial flows occur within the Blake Hollow and Dry Bread allotments. In addition, a number of ephemeral streams occur as well as several springs and stock ponds. A total of 50.2 miles of stream occur in the Project Area, of which 44.8 miles are ephemeral. At least 28 springs and 31 stock ponds are found throughout the allotments.

Table 3.4. Water features within the Monte Cristo Sheep Allotments.			
Allotment	Stream Length (miles)	Ponds	Springs
	Perennial		
Blake Hollow	0	6	6
Dry Bread	0	2	0
Little Monte	0	11	8
Bountiful	5.4	12	14

3.6.1.4 Stream Channel and Riparian Conditions

Stream channel conditions in the allotment are affected greatly by whether the stream reach is perennial or ephemeral. Generally, the perennial streams have deep-rooted, dense willows and sedges growing along the stream channels and the stream banks are stable. The ephemeral channels have shallow-rooted grasses and upland vegetation growing along the stream channels and the stream banks have low stability because of the shallow rooted vegetation. During spring runoff and high storm flow events, the stream banks will easily erode because of the low stability of the stream banks. Sheep don’t appear to be impacting the drainage bottoms as indicated by the continuous dense grasses that grow in the ephemeral stream bottoms such as in Dry Bread Canyon.

Sleepy Gulch and Big Spring Fork drainage below Big Spring are in good condition and their riparian areas appear to be functioning properly and are at or moving toward desired condition with many thick willows, sedges and rushes. In the Big Spring Fork drainage, some bank sloughing is located about 6,000 feet from the forest boundary. This is attributed to abandoned beaver dams and is not accelerated by livestock use.

3.6.1.5 Wetlands

Some wetlands occur in these allotments, estimated to be about 61 acres. Wetlands were delineated in a geographic information system using 2006 NAIP imagery and on the ground experience for identifying wetlands. An estimate of the amount of wetlands by wetland type in the Monte Cristo Sheep Allotments is shown in Table 3.5. Most of the wetlands are in the Bountiful allotment, are willow types that grow along the perennial stream channels in Silvia Hollow, below Big Creek Spring, and in Sleepy Gulch. The willow type wetlands appear to be in good condition as indicated by dense, contiguous

stands of willows. The sedge types are also found in small seeps in drainage bottoms and near ephemeral stream channels; they exhibit some trampling by livestock. Almost all of the wetlands associated with ponds, with the exception of ponds with beavers, were constructed for livestock use. These ponds are very small, about twenty feet in diameter, and have bare edges where livestock drink water and many go dry before the end of the summer, depending upon the amount of precipitation during the year. These ponds were originally constructed in or below small seeps and spring areas. The ponds with beaver are located at the head of Sleepy Gulch and are associated with beaver dams in the drainage bottom. These wetlands are in good condition and livestock have caused very little trampling in the wetlands.

Table 3.5. Wetland type and estimated amounts in the Monte Cristo Area Sheep Allotments.

Allotment	Amount of Wetland (acres)			
	Sedge	Willow	Pond	Pond w/ Beaver
Blake Hollow	0.6	0.6	0.7	0
Dry Bread	0.05	0	0.2	0
Little Monte	2.7	0	0.8	0
Bountiful	1.5	40.1	4.7	4.7
Total	4.9	40.7	6.4	4.7
Percent of Total	9	72	11	8

3.6.1.6 Floodplains

Floodplains are defined by Executive order 11988 as “lowland and relatively flat areas adjoining inland and coastal waters”. Floodplains have also been defined in various ways; for this analysis, floodplains are defined as flat areas adjacent to streams that are composed of unconsolidated depositional material derived from sediments transported by the related stream, based on definitions contained in Fairbridge, 1968. The streams in these allotments are very small and the floodplains are mainly located on the narrow flat area next to the willow-dominated perennial stream channels. These are the same areas that have good functioning wetlands and are located in Silvia Hollow, below Big Creek Spring, and in Sleepy Gulch. These floodplains are about 10 to 25 feet wide, have dense deep-rooted vegetation on them and are functioning properly. There are no indications that sheep grazing is affecting the function of the floodplains.

3.6.1.7 Municipal Watersheds

Water in the Dry Bread, Monte Cristo, and Bountiful allotments that flows into Causey Reservoir is in the headwaters of the Ogden City drinking-water source watershed and other smaller public drinking water sources. Most of the drinking water sources are from springs and groundwater. In the Ogden River drainage, there are not any public drinking water sources between the sheep allotments and Causey Reservoir except Camp Keisel, a Boy Scout Camp located near the mouth of Dry Bread drainage. Camp Keisel obtains its drinking water from a spring source. Other than in the Ogden drainage, there are not any drinking water source zones in any of the other 6th code hydrologic units that are located within the sheep allotments except Monte Cristo Guard Station spring source which would not be affected by livestock grazing since it is outside of and above the Blake Hollow allotment.

3.6.2 Environmental Consequences

The following is taken from the Wasatch-Cache National Forest Plan FEIS (USDA Forest Service, 2003b) and is a description of general effects that can occur to soil and water resources from grazing. “Livestock grazing directly impacts soil infiltration by trampling, soil compaction and loss of vegetative cover on both upland and riparian sites. Fecal wastes can increase bacterial concentrations in water through livestock defecation in a stream or riparian area. Water quality can be indirectly affected by the resulting increased soil runoff and erosion, and sediment delivery to adjacent riparian areas and streams (Holechek et al. 2001). Impacts are often greater in riparian zones because they are preferred because of the availability of shade, water and more succulent vegetation (Platts 1991). Over longer time periods, grazing can result in increased fine sediment loads from stream bank erosion, loss of riparian habitats by stream channel widening or degradation and lowering of water tables through channel degradation.”

Alternative 1, No Action (No Grazing)

Under this alternative, livestock would no longer be permitted to graze on the sheep allotments.

Stream Channel Morphology – Very little change is expected to stream channel morphology and vegetative conditions along riparian areas from the removal of sheep grazing because, currently, field observations indicate that sheep have very little effect on the stream banks and channels, stream temperatures or the vegetation along streams. Since most of the stream banks in this allotment do not have much trampling or trailing from sheep, it is expected that vegetation conditions along stream banks will improve slightly, mainly in a few areas where sheep have trails leading to water. These small bare soil areas would revegetate after sheep are removed. The bare soil areas around ponds that were constructed for watering sheep will revegetate after the removal of sheep.

Water Quality – It is expected that there may be a very little improvement on water quality from no grazing since current grazing on the allotments does not appear to have affected water quality conditions to much of a degree. Currently, there is very little indication that erosion and sedimentation is occurring from livestock grazing. Sites where bare soil is caused by sheep grazing are located mainly at ponds that were constructed for sheep watering. Most of these ponds are not connected to stream channels through surface flow and sediment generated from the bare soil areas is filtered out before surface flows reach flowing streams. A very small improvement would be seen from discontinued trailing of sheep on the few sheep trails that access the stream channel.

It is unknown to what degree bacteria would be reduced since beaver are active in the Big Creek drainage. They live in the stream channel itself and would contribute to bacteria found in the stream.

Very little change in stream temperature is expected since the willow and sedge communities are grazed very little by sheep. If the sheep were removed, stream side vegetation would provide very little additional shade and subsequent reduction in stream temperature than is currently found along the stream channels.

Wetlands – It is expected that very little change will occur to wetlands since very little impact to wetlands is occurring currently.

Floodplains – Since sheep grazing currently has not affected the ability of streams to flood onto the flood-prone areas adjacent to streams, the No Grazing alternative is also expected to not have any effect on these areas.

Municipal Watersheds – Since very little sedimentation of streams is occurring under the proposed action, only a very small amount of reduction in sedimentation of streams is expected under the No Grazing alternative. As a result, very little effect is expected on municipal watersheds.

Alternative 2, Proposed Action (Current Management)

The proposed action would authorize the continuation of grazing on the Monte Cristo Area Sheep Allotments under current standards and guidelines. In general, the effects on water resources from the Proposed Action will result in very little impact to stream banks, wetlands, water quality, and floodplains. It is expected that standards and guidelines for soil and water resources will continue to be met. The effects to specific water resource areas are described below.

Stream Channel Morphology – Observations of stream channel conditions were made during field trips in October 2008 and June 2009. Observations show that very little of the stream channel is affected by sheep grazing as indicated by only a few sheep trails seen accessing water along Big Spring Creek. Very little trampling is seen and willows and sedges are growing well in the riparian area. Beaver have built dams that impound water behind them appear to be the main morphological effect on the channel. The small effect of sheep grazing on channel conditions is expected to continue with very little change from current conditions.

Water Quality – In general terms, livestock grazing can adversely affect water quality by removing vegetation and soil trampling which may result in accelerated erosion and sedimentation of streams, increased nutrients from increased sedimentation and animal wastes, increased water temperatures from removal of overhanging stream side vegetation, and increased bacteria in streams from animal wastes. There appears to be very little effect to water quality from accelerated erosion, sedimentation, and trampling due to sheep grazing on the Monte Cristo Area Sheep Allotments because there are very few areas that have low ground cover. These areas are in a few tarweed-dominated areas near the ridgelines that are a long distance from water. The riparian areas have dense deep-rooted sedges and willows that provide stability and buffer sediment movement. There is very little use by sheep in riparian areas as indicated by the few trails to the stream. It is expected that stream temperatures are affected very little by sheep grazing since sheep have not removed the overhanging vegetation along stream channels. This is indicated by the maximum water temperature values of 10 to 15 degrees Celsius that were recorded in July and August 2009 in the exclosures on Sugar Pine and Wheeler Creeks. The willow communities in these exclosures are very similar to those in Big Spring Creek.

Water quality will be affected very little by sheep grazing under the Proposed Action. A bacteria sample was collected on Big Spring Creek above the enclosure in July 2009 using current Utah Division of Water Quality protocol. The results of the bacteria sample show that most of the bacteria in the stream are from non-warm blooded animals as indicated by the high Total Coliform value and low E. Coli value. Furthermore, the samples showed that the water quality met State standards for maximum counts of E. coli. It is expected that E. Coli bacteria concentrations in the streams draining the allotments are affected mainly by the beaver activity rather than by the sheep grazing as indicated by the minor effect sheep have in the riparian zones of the allotments and the high use of the riparian areas by beaver.

Wetlands – In general terms, wetlands may be impacted by livestock grazing by trampling of wet soils and removal of vegetation to the point where bare soils and erosion occur. A review of current wetland conditions on the allotments indicate that sheep trampling occurs mainly around ponds constructed for sheep watering below springs and seeps. Sheep are not trampling or removing vegetation to the point where they are causing bare spots or erosion along streams and springs. Wetlands will likely be affected very little by sheep grazing under the Proposed Action.

Floodplains – The natural condition of the stream channels within the allotments is that the streams do not have floodplains or that the areas adjacent to the stream channels have very small areas where sediment may become deposited during high flows. These are mostly associated with beaver activity that changes the shape of the stream channel by forming ponds behind beaver dams; these areas occur in most of the perennial stream reaches. Sheep have not affected the ability of the streams to flood and very little trampling has been seen in the flood-prone zones along the streams. It is expected that the ability of the streams to flood onto the flood-prone areas will continue on the allotments under the Proposed Action.

Municipal Watersheds – In general, sheep grazing may cause adverse effects to municipal watersheds by increasing sediment to streams that may need to be treated before use in municipalities. On the Monte Cristo sheep allotments, the effect of sheep grazing on municipal watersheds appears to be very low. This is because most ground cover conditions in the uplands and riparian areas are in good condition, as indicated by nested frequency and greenline surveys. Furthermore, stream banks appear to be stable as indicated by the deep-rooted sedge and willow plant communities that grow along the riparian areas. Very little sedimentation of streams appears to be caused by sheep as indicated by the very few trails along the streams and the good upland and riparian conditions that act as a buffer to runoff that may occur in the upland areas. These conditions are expected to continue under the Proposed Action.

3.6.3 Cumulative Effects

The cumulative effects area for this analysis includes the 6th code hydrologic units that the sheep allotments are in. Several other activities occur in these drainages that have the potential to affect erosion and resultant sedimentation of the streams, water quality, and wetlands. These other activities include recreation uses such as hiking, camping, ATV use, and horseback riding, as well as prescribed fire activities. There are very small areas where bare soil occurs from these activities but there is no indication that these activities

are causing sedimentation of the streams. There currently is very little effect from grazing on erosion and sedimentation, water quality, and wetlands in the sheep allotments. Therefore, the cumulative effects from the Proposed Action or the No Action alternative would be minor and inconsequential as related to water resources.

Irretrievable and Irreversible Commitment of Water Resources – No irretrievable and irreversible commitment of water resources is expected because, as indicated above, the effects of current grazing are minor. Through adaptive management, grazing practices could be adjusted for any unacceptable impacts to water resources that may occur over time, although this is unlikely since current management is maintaining favorable resource conditions.

3.7 Wildlife

3.7.1 Affected Environment

The potential effect of sheep grazing on wildlife was identified by the interdisciplinary team as an issue (see EA, Section 1.8.). The issue as identified included the potential for sheep grazing to decrease cover and forage used by a variety of wildlife species. Potentially affected species include USFWS-listed Threatened, Endangered, Proposed and Candidate species; Forest Service Sensitive species; Wasatch-Cache National Forest Management Indicator Species (MIS), migratory birds, and general species of local concern.

3.7.1.1 Threatened, Endangered, Proposed, and Candidate Species

According to the U.S. Fish and Wildlife Service (Utah Field Office) March 2009 *List of Endangered, Threatened, Proposed, and Candidate Species for Utah Counties* (available in the project record), there are two Threatened (T), and one Candidate (C) species occurring, or potentially occurring, in Cache, Weber, and Rich County. These include the Canada lynx (T), black-footed ferret (T-Rich County only), and the yellow-billed cuckoo (C-Cache and Weber County only). No Threatened or Endangered species have been found in the Monte Cristo Area Sheep Allotments (see individual descriptions, below).

Canada lynx. Habitat for Canada lynx occurs within the Ogden Ranger District, primarily in the conifer cover types dominated by various combinations of lodgepole pine, Douglas-fir, subalpine fir, and Engelmann spruce interspersed with the aspen cover type. The Ogden Ranger District lies within a “travel corridor” between two larger habitat areas (in Idaho and within the Uinta Mountains of Utah) and is not considered permanent resident habitat. In a letter from the USFWS dated November 6, 2002, lynx habitat within the Ogden Ranger District was reclassified from Lynx Analysis Unit (LAU) to linkage area due to a low percentage of primary habitat. No critical habitat was identified within the State of Utah for the species (USDI Fish and Wildlife Service (2009a).

Black-footed ferret. Black-footed ferrets are a prairie species almost entirely obligate on prairie dog towns for food and shelter. Portions of Rich County are considered to be historic range for black-footed ferrets. The Wasatch Cache National Forest is probably

on the very western edge of that range, if included at all. None are known or expected to occur within the USFS portion of the Monte Cristo Area Sheep Allotments.

Yellow-billed cuckoo. The current distribution of yellow-billed cuckoos in Utah is poorly understood, though they appear to be an extremely rare breeder in lowland riparian habitats statewide. Nesting habitat is classified as dense lowland riparian characterized by a dense sub-canopy or shrub layer (regenerating canopy trees, willows, or other riparian shrubs) within about 300 feet of water. Overstory in these habitats may be large, gallery-forming trees, 33 to 90 feet in height or developing trees 10 to 27 feet in height, usually cottonwoods. Nesting habitats are found at elevations below 6,000 ft. Cuckoos may require large tracts of contiguous riparian nesting habitat between 100 and 200 acres. Yellow-billed cuckoo habitat does not occur within the Monte Cristo Area Sheep Allotments.

3.7.1.2 Forest Service Intermountain Region Sensitive Species

Forest Service Intermountain Region sensitive species and/or habitats occurring or possibly occurring in the Monte Cristo Area Sheep Allotments are shown below in Table 3.6. Of those species listed as sensitive for the Wasatch-Cache planning area of the Uinta-Wasatch-Cache National Forest, the following occur or are likely to occur within the project area: northern goshawk, flammulated owl, three-toed woodpecker, and the western big-eared bat. The North America wolverine, greater sage grouse, boreal owl, and great gray owl may possibly occur within the project area.

The sharp-tailed grouse, bighorn sheep, bald eagle, and peregrine falcon have not been found and are not believed to occur within the project area. Therefore, they will not be discussed further in this document. Currently, the spotted bat is not known to occur on the Ogden Ranger District and will not be discussed further. Detailed habitat requirements and general distribution information for all sensitive species on the Wasatch-Cache National Forest are discussed in the Revised Forest Plan (USDA Forest Service 2003).

The northern goshawk is also a management indicator species (MIS) for the Forest. Please see the MIS section for detailed discussions about that species.

Table 3.6 Intermountain Region Sensitive Species

Species	Evaluation for Analysis
Northern goshawk <i>Accipiter gentilis</i>	Species is also MIS. See MIS section for evaluation.
Flammulated owl <i>Otus flammeolus</i>	Flammulated owls are present on the Wasatch-Cache National Forest and appear to be fairly well distributed. On the Ogden Ranger District, flammulated owl habitat primarily consists of mature stands of aspen, aspen/conifer, and conifer/aspen. A total of 10,833 acres of aspen and aspen/conifer occur within the Monte Cristo Sheep allotments (66 percent of the project area).
Three-toed woodpecker <i>Picoides tridactylus</i>	Their distribution generally coincides with the range of spruce habitat, however they can be found in sub-alpine fir, Douglas-fir, grand fir, ponderosa pine, aspen, and

Species	Evaluation for Analysis
	lodgepole pine forests. The three-toed woodpecker is dependent on recent burns and bark beetle infestations for food resources. Coniferous forests generally above 8000ft (2400m) in elevation are typical of wintering and nesting habitat. In Utah, three-toed woodpeckers also use aspen for nesting where intermixed or adjacent to coniferous forests (Hill et al. 2001).
Western big-eared bat <i>Corynorhinus townsendii</i>	Widely distributed throughout the Intermountain Region. The species occurs in large numbers at Bat Cave on the Ogden District and in Logan Cave on the Logan District. Bat Cave is located outside of and to the south of the project area. Western's may exist in other areas of the Forest where there is suitable cave or cliff roosting habitat.
North American Wolverine <i>Gulo gulo</i>	Recent data searches (USDA Forest Service 1994a) indicate that no wolverines were sighted in Utah between 1961 and 1983, but there were sightings between 1983 and 1993, on the Ashley and Wasatch-Cache National Forests. A 1995 survey conducted in Franklin Basin did not produce any tracks or photographic evidence of wolverines (Bissonette et al. 1995). On March 29, 2002 a helicopter survey for wolverine conducted by the Caribou National Forest identified probable wolverine tracks just south of the Idaho/Utah state line (USDA Forest Service 2002a). On March 17, 2004 a vehicle hit and killed a wolverine on U.S. Highway 30 near Fossil Butte National Monument west of Kemmerer. There have been unconfirmed sightings elsewhere on the Uinta-Wasatch-Cache National Forest.
Greater sage grouse (<i>Centrocercus urophasianus</i>)	Sagebrush dominated habitat with an understory of native grasses and forbs.
Boreal owl <i>Aegolius funereus</i>	Boreal owls have responded to taped calls in northern Utah in 2-3 locations on the Ashley, Uinta, and Wasatch-Cache National Forests. Nest locations have not been found on the Wasatch-Cache National Forest. In 2001, on the Uinta National Forest, a nesting boreal owl was located. This was the first documented nesting of a boreal owl in Utah (Mika 2000 pers. comm.).
Great Gray Owl <i>Strix nebulosa</i>	In the Intermountain Region, great gray owls occur primarily in lodgepole pine/Douglas-fir/aspen zone and in ponderosa pine. Great gray owl surveys have been conducted on the Logan Ranger District. Data collected from these surveys yielded no evidence of great gray owls. During winter some birds stay on or near their breeding territories and others make irregular movements in search of prey and favorable snow conditions. In general, it is felt that these winter vagrants only occasionally visit Utah.

3.7.1.3 Species at Risk

Species at risk have been identified in the Revised Forest Plan (RFP, page GL-23) as “Federally listed Endangered, Threatened, Candidate, and Proposed and other species for which loss of viability, including reduction in distribution or abundance, is a concern within the planning area (USDA Forest Service 2003). Other species-at-risk may include Sensitive species and State-listed species.” Some of these species are also neotropical or migratory birds. The Species at Risk List for the Forest was revised on February 23, 2004. Species at risk on the Uinta-Wasatch-Cache National Forest potentially occurring within the project area (not discussed elsewhere in this document under Endangered, Threatened, Candidate, Sensitive, or Management Indicator Species) are shown in Table 3.7.

Table 3.7 Species at Risk (not covered under Endangered, Threatened, Candidate, Sensitive, or Management Indicator Species)

<p>Gray Catbird <i>Dumetella carolinensis</i></p>	<p>“The gray catbird, <i>Dumetella carolinensis</i>, breeds across most of the United States and in southern Canada. It winters in Central America, as well as along the Atlantic and Gulf coasts of the United States. Old records suggest that the species may have once been common in Utah, but it is now rare in the state, breeding only in a few limited areas of north-central Utah. The gray catbird prefers dense shrublands and forested areas with thick undergrowth.” UDWR 2009</p>
<p>Black rosy-finch <i>Leucosticte atrata</i></p>	<p>Found at high elevation near timberline. Not suspected in the project area.</p>
<p>Black swift <i>Cypseloides niger</i></p>	<p>Nests under waterfalls. No nesting habitat found in or adjacent to the project area.</p>
<p>Williamson’s sapsucker <i>Sphyrapicus thyroideus</i></p>	<p>Lives in conifer stands. May be in project area but would be unaffected by grazing.</p>
<p>Brewer’s sparrow <i>Spizella breweri</i></p>	<p>The Brewer’s sparrow is known to occur within the project area. Brewer's sparrows breed primarily in shrub steppe habitats in Utah and are considered to be shrub steppe obligates. In Utah, Brewer's sparrows are common to very common summer residents. It nests in the mid-upper canopy of dense sagebrush and are usually located in patches of sagebrush that are taller and denser, with more bare ground and less herbaceous cover, than the surrounding habitat.</p>
<p>Sage sparrow <i>Amphispiza belli</i></p>	<p>“The sage sparrow prefers shrubland, grassland, and desert habitats. The nest of twigs and grasses is built either low in a shrub or on the ground.” UDWR 2009</p>
<p>Broad-tailed hummingbird <i>Selasphorus platycercus</i></p>	<p>The broad-tailed hummingbird (Baldy and Lightning Ridge surveys) is known to occur within the project area. The broadtail is a common breeder in the eastern and central parts of the Great Basin. It nests primarily in riparian habitat though it also occurs within aspen, ponderosa pine, Engelmann spruce, sub-alpine fir, and</p>

	Douglas fir -dominated habitats. The broad-tailed hummingbird typically requires streamside areas adjacent to open patches of meadows or grasses with good quantities of wild flowers available throughout the breeding season. This hummingbird feeds on nectar of wildflowers.
Virginia’s Warbler <i>Vermivora virginiae</i>	Nests are typically embedded or covered with dead or decaying leaves and grasses in areas of dense brush. Dense mountain brush areas and stream side thickets at low and mid-elevations are preferred habitats (UDWR 2009). May occur in the project area in thick underbrush.
Fringed myotis <i>Myotis thysanodes</i>	It is uncertain whether this species occurs within the Ogden Ranger District, since only specimens from southern and east-central Utah have been reported in the literature (Hasenyager 1980). The fringed myotis inhabits caves, mines, and buildings, most often in desert and woodland areas.
Pine marten <i>Martes Americana</i>	It occurs in much of Alaska and Canada, and its range extends into several areas of the contiguous United States (UDWR 2001). In Utah, the species has been found in many of the high remote mountainous areas of the state. Pine martens prefer forest habitat, where their dens can be found in logs, hollow trees, stumps, and rock crevices.

3.7.1.4 Management Indicator Species

The Revised Forest Plan identified the goshawk (*Accipiter gentilis*), the snowshoe hare (*Lepus americanus*), and beaver (*Castor canadensis*) as wildlife management indicator species (RFP, pages J4-J5). Monitoring of MIS populations is conducted according to the monitoring protocols established in the Forest Plan (USDA Forest Service 2003). For all MIS species, the most recent information is found in the 2008 MIS Report (Uinta-Wasatch-Cache National Forest 2008). For additional information on Forest MIS, refer to that report.

Northern goshawk- MIS for aspen, conifer and mixed-conifer vegetation types

Goshawk surveys have been conducted within the project area. One known goshawk nest territory occurs within the Bountiful Sheep Allotment. A portion of the approximately 5,400-acre goshawk foraging area occurs within the Bountiful Sheep Allotment and overlaps into the Dairy Ridge Cattle Allotment. The approximately 420-acre post-fledgling area and the approximately 30-acre nest area occur within the Bountiful Sheep Allotment (maps of goshawk areas are located within the project file). It is likely that undiscovered goshawk territories exist within the conifer vegetation type. Monitoring data suggest that the population is experiencing a decreasing static downward trend (Uinta-Wasatch-Cache National Forest 2008).

Snowshoe Hare- MIS for pole/sapling aspen, conifer and mixed-conifer vegetation types

Much of the allotment area consists of mature pure aspen stands which display very low use by snowshoe hares. Monitoring data suggest that the Wasatch/Bear River Range snowshoe hare population is experiencing an increasing trend (Uinta-Wasatch-Cache National Forest 2008).

Beaver- MIS for riparian vegetation types

Within the project area, beaver are known to occur within Wheeler Creek and Big Spring Fork, both within the Bountiful Sheep Allotment. Historical beaver activity has been found within Silvia Hollow. No other beaver activity is known to occur within the area. See the aquatic section for additional information regarding streams. For beaver, there is currently not enough monitoring data to suggest a trend in the population from data collected on the Forest. Data provided by the State of Utah and presented in the 2008 MIS monitoring report suggest that the population is static (Uinta-Wasatch-Cache National Forest 2008).

3.7.1.5 Big Game

Big game (deer, elk, and moose) and their habitat are widely distributed throughout the project area. The habitat in the project area primarily serves as summer crucial range for big game. *Crucial value habitat* is defined by the Utah Department of Wildlife Resources (UDWR) as “habitat on which the local population of wildlife species depends for survival because there are no alternative ranges or habitats available. Crucial value habitat is essential to the life history requirements of a wildlife species. Degradation or unavailability of crucial value habitat will lead to significant declines in carrying capacity and/or numbers of the wildlife species in question.”(UDWR 2006) The entire area of the Monte Cristo Sheep Allotments is considered crucial summer range for elk and deer. Some crucial winter range exists in the allotments for moose (approximately 5,710 acres across the allotments), and to a much lesser extent for elk (34 acres in the southern portion of the bountiful Allotment).

The project area occurs within two UDWR Harvest Units: Blake Hollow and the northern portion of Dry Bread occur primarily within the Cache Harvest Unit and Little Monte, Bountiful, and the southern portion of Dry Bread occur within the Morgan/South Rich Harvest Unit (Table 3.8). Table 3.9 and 3.10 display the estimated numbers of animals and population objectives in the Morgan/South Rich and Cache Harvest Units. Within the four allotments 28% and 72% of the land area occurs within the Cache and Morgan/South Rich Allotments, respectively.

Table 3.8. Approximate Allotment Acres by Harvest Unit.

HARVEST UNIT	Blake Hollow Acres	Dry Bread Acres	Little Monte Acres	Bountiful Acres
CACHE	3836	659	21	0
MORGAN/SOUTH RICH	212	1248	4149	6265

Table 3.9. Estimated numbers of animals and population objectives in the Morgan/South Rich Harvest Unit for deer, elk and moose.

Species	Population Objective	2008 Population Estimates
Deer	12,000	6,100
Elk	3,500	4,400
Moose	640	485

Information provided by Randy Wood UDWR Wildlife Biologist (13 April 2009).

Table 3.10. Estimated numbers of animals and population objectives in the Cache Harvest Unit for deer, elk and moose.

Species	Population Objective	2008 Population Estimates
Deer	25000	13700
Elk	2300	2200
Moose	200	200

Information provided by Randy Wood UDWR Wildlife Biologist (April 13, 2009).

3.7.2 Environment Consequences

Public and agency scoping, followed by Forest Service interdisciplinary team review, identified the following issue regarding wildlife to be addressed in this analysis:

- Sheep grazing can decrease cover and forage used by a variety of wildlife species. Potentially affected species include USFWS-listed Threatened, Endangered, Proposed and Candidate species; Forest Service Sensitive species; Wasatch-Cache National Forest Management Indicator Species (MIS), migratory birds, and general species of local concern.

Effects Analysis Methods and Assumptions

Baseline conditions were determined through review of literature and field survey/observations. Field surveys were conducted to identify and quantify wildlife species and populations, and to characterize habitat conditions in the Monte Cristo Area Sheep Allotments. To compare the environmental effects by alternative it was necessary to make a few key assumptions. These were:

- Under the *No Action* (No Grazing) alternative, it is assumed that light grazing by native ungulates and other native herbivore species would maintain plant vigor and therefore, vegetation production would not be reduced.
- Utilization standards included in the Revised Forest Plan (and implemented with this project) are to maintain critical minimum residuals to protect soil, forage plant vigor, livestock diet quality, and wildlife habitat. The utilization standards would represent the percentage of use for key species at moderate grazing levels. Stubble height and utilization standards are measured on a timely basis and actions to remove livestock are implemented before standards are exceeded.

- Monitoring is conducted as identified in the allotment management plan and changes are made when conditions are not favorable or are moving away from desired future condition.
- Livestock are directed toward the use of suitable uplands through strategic salting and herding, thus reducing pressure on riparian habitat, springs, and wet meadows.
- Barbed wire allotment boundary let-down fences could result in minor losses of big game by entanglement, but this would not cause noticeable changes to population numbers.

3.7.2.1 Threatened, Endangered, Proposed, and Candidate Species

Habitat for the yellow-billed cuckoo and black-footed ferret does not occur within in the allotments and there have been no recorded occurrences. Therefore, populations of these species will not be affected.

Canada lynx. The July 3, 2003 U.S. Fish and Wildlife Service Notice of Remanded Determination of Status for the contiguous United States distinct population segment of the Canada Lynx (USDI 2003) specified that no evidence exists that certain risk factors pose a threat to individual lynx, lynx populations, or lynx habitat. Grazing was not specifically addressed because there was no information to indicate that it posed a threat to lynx.

The allotments lie within a *travel corridor* for the Canada lynx rather than a permanent resident habitat. The area within the allotment was reclassified in 2002 from a Lynx Analysis Unit (LAU) to Linkage Area, due to a low percentage of primary lynx habitat found here.

Within the USFWS Recovery Outline for the Canada Lynx (USDI Fish and Wildlife Service 2005a), core areas, provisional core areas, secondary areas, and peripheral areas were identified; none of these areas have been identified to occur within the project area. On 9 November 2005, the USFWS proposed critical habitat for the Canada Lynx within the United States; no critical habitat was proposed within the project area or within Utah (USDI Fish and Wildlife Service 2005). On February 25, 2009 the USFWS designated critical habitat for the Canada Lynx within the United States; no critical habitat designated in the project area or within Utah (USDI Fish and Wildlife Service 2009a).

The Lynx Conservation Strategy (Ruediger et al, 2000) specifies the following programmatic planning guideline in Linkage Areas: “Where feasible, maintain or enhance native plant communities and patterns and habitat for potential lynx prey, within identified key linkage areas.”

In relationship to effects to the wildlife corridor, the following is pertinent from the Notice: “To significantly impact a local lynx population, an activity would have to occur across a very large area (presumably at least the size of several home ranges), create a homogeneous forest that does not provide the various stand ages, species composition,

and structure that are good snowshoe hare and lynx habitat, or result in a barrier that effectively precludes dispersal.”

Although the lynx is not a permanent resident here, the potential effects to the lynx are related to the effects on their preferred prey, primarily snowshoe hare, but also a variety of small mammals.

Alternative 1, No Action (No Grazing)

Under this alternative small mammal species diversity and overall species abundance across the allotment would likely be greatest.

Douglass and Frisina’s (1993) study displayed that an increase in vegetation cover usually reflects an increase in small mammal populations and an increase in survival rate. Actual biomass available to prey is likely to be greater with reduced grazing.

An increase in cover and forage would likely increase survivorship of snowshoe hares which could lead to slightly higher population numbers of snowshoe hares across the allotment, though a number of factors likely influence snowshoe populations. Prey would most likely be in greatest abundance under this alternative.

Prey would most likely be in greatest abundance under this alternative thus making it easier for lynx to move through the area.

Alternative 2, Proposed Action (Current Management)

Livestock grazing under the proposed action alternative would continue to affect those species that require high levels of litter and residual vegetation within the allotment. The deferred rotation system concentrates livestock within a specific area for a short period of time, and then animals are rotated to the next area. The areas grazed early in the summer may show some recovery of vegetation forage conditions for wildlife once livestock are removed from the area, though this is dependent if weather conditions provide moisture for vegetation regrowth and recovery. The areas of the allotment utilized later would provide forage and cover benefits for the early portion of the summer for wildlife species.

As stated in the Biological Assessment written for this project, it is determined that the Proposed Action (Current Management) alternative on the Canada lynx may affect, but is not likely to adversely affect the Lynx or its habitat. Prey species abundance would be affected by the proposed action alternative, though this would not likely influence the effectiveness of the area as a *travel corridor* for lynx.

3.7.2.2 Forest Service Intermountain Region Sensitive Species

The effects to Forest Service Intermountain Region Sensitive species are discussed below (Table 3.11).

Table 3.11. The Intermountain Region’s list of sensitive species for the Wasatch-Cache portion of the forest and the effects of each alternative on the species.

Species	Effects of No Action (No Grazing) Alternative	Effects of Proposed Action (Current Management) Alternative
Northern goshawk <i>Accipiter gentilis</i>	Also a MIS. See that section for detailed discussion.	Also a MIS. See that section for detailed discussion.
Flammulated owl <i>Otus flammeolus</i>	Under this alternative small mammal species diversity and overall species abundance across the allotment would likely be greatest among the alternatives.	Livestock grazing under the Proposed Action alternative would continue to affect those prey species that require high levels of litter and residual vegetation within the allotment.
Three-toed woodpecker <i>Picoides tridactylus</i>	The No Action Alternative would have no effect on the three-toed woodpecker. This species nests, roosts, and forages in conifer and conifer/aspen forests and is not dependent on understory vegetation conditions.	The Proposed Action Alternative would have no effect on the three-toed woodpecker. This species nests, roosts, and forages in conifer and conifer/aspen forests and is not dependent on understory vegetation conditions.
Western big-eared bat <i>Corynorhinus townsendii</i>	This alternative would improve habitat for insects associated with riparian areas, wetlands, and springs. This may not influence actual bat numbers since bat populations may be more influenced by the availability of suitable roost sites or other such limiting factors. This alternative would not affect bat roosting sites, maternity colonies, or hibernacula.	Livestock grazing would continue to affect foraging habitat for bat species, mainly in riparian areas, wetlands, and springs. Vegetation has been reduced in many riparian areas from a combination of livestock grazing and trampling. This would likely reduce the abundance of nocturnal insect species that bats forage upon, though this may not influence actual bat numbers. Bat populations may be more influenced by the availability of suitable roost sites or other such limiting factors. This alternative would not affect bat roosting sites, maternity colonies, or hibernacula.
North American Wolverine <i>Gulo gulo</i>	The effects to the wolverine are related to the effects on their prey, including small to medium sized mammals such as rabbits and hares, beavers, squirrels and a variety of ground nesting birds. Small	The effects to the wolverine are related to the effects on their prey, including small to medium sized mammals such as rabbits and hares, beavers, squirrels and a variety of ground nesting birds.

Species	Effects of No Action (No Grazing) Alternative	Effects of Proposed Action (Current Management) Alternative
	mammal species diversity and overall species abundance across the allotment would likely be greatest among the alternatives.	Livestock grazing under the Proposed Action Alternative would continue to affect those species that require high levels of litter and residual vegetation within the allotment.
Greater sage grouse (<i>Centrocercus urophasianus</i>)	No grazing will improve the understory vegetation and sagebrush species that sage-grouse are dependent on.	Grazing would continue to reduce the understory grasses and forb species available for brood-rearing and summer food. Trampling of vegetation would also reduce the amount of grass and forb species, as well as the amount of sagebrush cover available to the sage-grouse.
Boreal owl <i>Aegolius funereus</i>	The effects of any of the alternatives would likely be negligible on boreal owl habitat or populations. Also, see small mammal effects.	The effects to the boreal owl are related to the effects on their prey, primarily voles. A majority of the area that is used by the boreal owl are large stands of conifer. Most of these areas are not capable acres and thus are not used by livestock. The effects of any of the alternatives would likely be negligible on boreal owl habitat or populations.
Great Gray Owl <i>Strix nebulosa</i>	These winter vagrants only occasionally visit Utah. The effects of this alternative would be negligible on great gray owl habitat or populations.	The effects of this alternative would be negligible on great gray owl habitat or populations.

3.7.2.3 Species at Risk

Species at risk have been identified in the Revised Forest Plan as “Federally listed Endangered, Threatened, Candidate, and Proposed and other species for which loss of viability, including reduction in distribution or abundance, is a concern within the plan area (USDA Forest Service 2003). Other species-at-risk may include sensitive species and State-listed species.” Some of these species are also neotropical or migratory birds. Impacts to those species not discussed elsewhere in the effects section are discussed here (Table 3.12).

Table 3.12 Species at Risk (not covered as Endangered, Threatened, Candidate, Sensitive, or Management Indicator Species) on the Uinta-Wasatch-Cache National Forest that may be found in the project area

Species At Risk	Effects of No Action (No Grazing) Alternative	Effects of Proposed Action (Current Management) Alternative
Gray Catbird <i>Dumetella carolinensis</i>	Habitat for this species would probably increase as the catbird prefers dense shrublands and forested areas with thick undergrowth.	There would be no change in the existing habitat for this species.
Williamson's sapsucker <i>Sphyrapicus thyroideus</i>	No change in habitat for this species.	No change in habitat for this species.
Brewer's sparrow <i>Spizella breweri</i>	Removal of grazing will lead to an increase of grasses and forbs within the mountain big sagebrush vegetation type thus reducing preferred Brewer sparrow nesting habitat. In addition, susceptibility to catastrophic wildfires in the dense mountain big sagebrush areas would increase since fine fuels, such as grasses, will be more abundant. Wildfire could greatly reduce the amount of habitat available for breeding Brewer's sparrows and reduce Brewer's sparrow numbers.	Livestock grazing would maintain old and dense mountain big sagebrush areas and maintain lower herbaceous understory cover that is preferred and utilized by Brewer's sparrows for breeding.
Sage sparrow <i>Amphispiza belli</i>	Feeding and nesting habitat for this species would increase.	No change from the existing condition. Habitat will continue to be affected.
Broad-tailed hummingbird <i>Selasphorus platycercus</i>	Understory vegetation diversity, especially within aspen stands, will increase, thus native forb species utilized by the broad-tailed hummingbird will be more abundant. This may result in an increase in broad-tailed hummingbird abundance. This alternative will not affect nests or nesting habitat.	Livestock grazing will continue to affect foraging habitat for the broad-tailed hummingbird, mainly in riparian areas and adjacent uplands. This alternative will not likely affect nests but could affect vegetation conditions associated with lower canopy nest sites.
Virginia's Warbler <i>Vermivora virginiae</i>	Nesting habitat would increase under this alternative.	No change from the existing conditions.
Fringed myotis <i>Myotis thysanodes</i>	Effects of this alternative are similar to the big-eared bat, discussed above.	Effects of this alternative are similar to the big-eared bat, discussed above. Success of this species may be more dependent on availability of

Species At Risk	Effects of No Action (No Grazing) Alternative	Effects of Proposed Action (Current Management) Alternative
		bat roosting sites, maternity colonies, or hibernacula. None are know in the area
Pine marten <i>Martes Americana</i>	Actual biomass available to prey is likely to be greater with no grazing. An increase in vegetation cover usually reflects an increase in small mammal populations and an increase in survival rate. This alternative will improve vegetation conditions for forage and cover. Small mammal species diversity and overall species abundance across the allotment will likely be greatest.	Livestock grazing under this alternative will continue to affect those species that require high levels of litter and residual vegetation, particularly in riparian areas and aspen stands.

3.7.2.4 Management Indicator Species

Northern goshawk

In view of the area the population covers and the limited area within these allotments in respect to this population, there will likely be no measurable effect on of the northern goshawk population.

Alternative 1, No Action (No Grazing)

This alternative increases available forage and cover across the allotment. Small mammal species diversity and overall species abundance across the allotment will be greatest among the alternatives. An increase in cover will likely increase grouse nest success and increase survivorship which could lead to higher population numbers of grouse across the allotment. Prey will most likely be in greater abundance under this alternative. Increased prey abundance may increase nest success and nestling survivorship and may reflect in an increase in goshawk abundance locally, though use of the Monte Cristo area by goshawks seems to be limited by the low amount of conifer “preferred nesting” habitat.

Alternative 2, Proposed Action (Current Management)

Under this alternative, livestock will continue to affect those species that require high levels of litter and residual vegetation, particularly in riparian areas and aspen stands. The deferred rotation system concentrates livestock within a specific area for a short period of time, and then animals are moved (rotated) to the next area, thus providing a variety of cover and forage conditions across the allotment. The deferred rotation grazing system will affect all capable acres within the growing season, thus affecting cover condition across the area (with the exception of the rested pasture within the Bountiful allotment). The areas grazed early in the summer may show some recovery of vegetation forage and cover conditions for small mammals once livestock are removed from the area, though this is dependent if weather conditions provide moisture for vegetation regrowth and

recovery. The areas of the allotment utilized later will provide forage and cover benefits for the early portion of the summer for small mammal species. Portions of the area that would be used by goshawks are conifer stands, which are not capable acres for livestock grazing. Livestock grazing may influence nest success and nestling survival.

Snowshoe hare

Although grazing by sheep and wild ungulates may to some degree increase competition with snowshoe hare for forage resources, particularly in riparian areas, it is not likely this will have any measurable effect on snowshoe hare populations. Browsing or grazing can have an effect on snowshoe hare habitat by reducing the amount of available winter browse and altering the structure or composition of native plant communities. However, given the large area the population covers and the limited area within these allotments, and the fact that their primary habitat is thick understory conifer, there will likely be no measurable effect on snowshoe hare populations.

Alternative 1, No Action (No Grazing)

Under this alternative, increases in forage and in cover will likely increase survivorship which could lead to slightly higher population numbers of snowshoe hares across the allotment. But again, snowshoe hare population numbers can vary greatly within the local area, the reasons for which are not clear.

Alternative 2, Proposed Action (Current Management)

The Proposed Action Alternative (Current Management) will continue to reduce cover and forage vegetation to some degree for the snowshoe hare within the capable upland portion of the allotment. The forested upland portions of the allotment areas consist primarily of aspen, which has displayed low use by snowshoe hares. Conifer/aspen forest has displayed considerable use by snowshoe hares but only consists of approximately 3 percent of the allotment area. The conifer forest type will largely be unaffected, since these areas are not considered capable for livestock grazing.

Beaver

The distribution of beaver on the allotments relates to the presence of perennial water. Within the project area, beaver are known to occur within Wheeler Creek and Big Spring Fork, both within the Bountiful Allotment.

In view of the area the population covers and the limited beaver habitat within these allotments, there will likely be no measurable effect on of beaver populations.

Alternative 1, No Action (No Grazing)

This alternative will likely improve riparian conditions slightly within the allotment and will likely provide small benefits to the beaver, due to limited habitat. Changes in occupancy could occur though large increases in the beaver population are not likely, due to limited habitat. In addition, trapping likely plays a role in regulating beaver within the area.

Alternative 2, Proposed Action (Current Management)

In this alternative livestock grazing will continue to reduce the amount of willows available as forage and for use as building materials where currently available on the

allotment. Despite this, the distribution of beaver will likely continue to be the same due to the presence of sufficient perennial water to support beavers. Beaver numbers will not likely change from the current condition.

In either alternative, Silvia Hollow will likely be occupied once again by beaver in the near future due to the presence of beaver activity within nearby Wheeler Creek.

3.7.2.5 Big Game

Deer

Crucial summer range within the allotments is not a limiting factor for deer populations in these deer management units. However, the reduced availability of quality forage within the summer may influence fawn condition/weights going into winter and may affect fawn winter survival. In addition, grazing can have some degree of negative effect by altering the structure and species composition (grasses, forbs, and shrubs) of aspen stands.

Alternative 1, No Action (No Grazing)

The *No Action (No Grazing)* alternative will improve forage conditions (amount and quality of available forage) for deer on their crucial summer range. However, actual deer numbers will not likely be measurably influenced since the population is most directly affected by the availability of suitable winter range within the harvest units.

Alternative 2, Proposed Action (Current Management)

The *Proposed Action (Current Management)* alternative will continue to reduce crucial summer range forage and the quality of available forage to deer across the allotments. The areas grazed early in the summer may show some recovery of vegetation forage conditions for wildlife once livestock are removed from the area, though this is dependent if weather conditions provide moisture for vegetation regrowth and recovery. The areas of the allotment utilized later will provide forage benefits for the early portion of the summer for deer. However, this may not measurably influence deer or deer populations since they are mainly affected by the availability of suitable winter range within the harvest units.

Elk

Elk numbers are essentially at objective for both harvest units. Elk populations are likely limited by the availability of suitable winter range and are managed at or near population management objectives by hunter harvest.

Alternative 1, No Action (No Grazing)

The *No Action (No Grazing)* alternative will improve forage conditions for crucial summer elk habitat. However, this will not influence actual elk numbers since they are largely managed at or near population management objectives by hunter harvest. Also, since understory vegetation diversity within mature aspen stands will increase, palatable forb species used by elk will become more abundant. Riparian areas used by elk for forage, watering, and as wallows will not be affected by livestock grazing, as none will occur under the *No Action* alternative. In addition, greater calf elk weights and animal condition in the fall will improve animal survival in the winter.

Alternative 2, Proposed Action (Current Management)

The *Proposed Action (Current Management)* alternative will continue to hold crucial summer range forage and the quality of available forage to elk across the allotments at existing lower levels than what alternative 1 would provide. The areas grazed early in the summer may show some recovery of vegetation forage conditions for wildlife once livestock are removed from the area, though this is dependent if weather conditions provide moisture for vegetation regrowth. The areas of the allotments utilized later will provide forage benefits for the early portion of the summer for elk. This will not likely influence elk populations, since they are at population management objective within the harvest units. Riparian areas which are used by elk for forage, watering, and as wallows will continue to be affected by livestock grazing.

Moose**Alternative 1, No Action (No Grazing)**

The *No Action (No Grazing)* alternative may result in slight improvement of forage conditions (amount and quality of available forage) for moose. Riparian areas are largely limited within the allotments. Any improvement will not influence actual moose numbers since they are largely managed at or near population management objectives by hunter harvest.

Alternative 2, Proposed Action (Current Management)

The *Proposed Action (Current Management)* alternative will likely have little effect on summer and winter range forage and the quality of available forage for moose on the allotment because of the limited habitat that current exists in the allotment. Riparian areas are very limited within the area and occur at Wheeler Creek, Silvia Hollow, and Big Spring Fork. Browse species consist primarily of willow species within the area. A portion of Wheeler Creek currently is protected from the effects of livestock grazing by a riparian enclosure installed approximately 4 years ago.

3.7.3 Cumulative Effects

This section discusses the effects of past, present, and reasonably foreseeable future connected and cumulative actions, including the proposed action on wildlife.

The area of influence for the cumulative effects analysis for wildlife is the project area for a majority of the species. For species with large home ranges/territories or those which make large movements (e.g. lynx and wolverine), the area of influence is larger than the Ogden Ranger District and includes adjacent lands (primarily to the north and south). Big game species such as moose and elk are managed by UDWR within harvest units which includes a portion of USFS managed lands and lands of other ownership (primarily private land ownership). The Ogden Ranger District is located within a portion of a wildlife corridor that has regional importance in providing linkage to other larger habitat areas. This is especially true for forest carnivores such as the Canada lynx.

The major influences on wildlife and their habitats within the allotments have been livestock grazing (which has had some affect on cover, forage, and vegetation composition and species diversity), fire suppression (which has reduced the presence of early successional vegetation classes) and roads, trails, and winter recreation use (which has affected wildlife through disturbances). Timber harvest has occurred within portions

of the allotment and has altered the forest age classes within the area which has likely been beneficial to many species of wildlife. Fire has had minor effects to wildlife in the allotment area and within the Ogden Ranger District. Reasonably foreseeable future actions which are proposed within the allotment area consist of the possible installation of the Ruby Pipeline within the Blake Hollow Allotment. This project occurs within an existing pipeline corridor and effects to wildlife species would be minimal and primarily be limited to a short time period during installation.

Many of the activities described below make changes in vegetation successional stages which in many instances are beneficial to many wildlife species, especially considering that a majority of the habitat types within the Wasatch-Cache National Forest are in the mature and old classes.

Timber Harvest Projects

Overall, timber harvest has had a minor effect on wildlife within the Ogden Ranger District. The majority of the forest type is old or mature. Past conifer timber harvest most likely benefited species (those which prefer early successional stands) by the creation of openings and young conifer and aspen stands. This is especially true for species such as the snowshoe hare, which prefers young lodgepole pine stands.

Wildland Fire, Prescribed Burn Projects, and Suppression Activities

Fire has had minor effect on wildlife in the area. Fire suppression has likely had the greatest effect by reducing the abundance of species that prefer early successional vegetation classes. Fire suppression has reduced habitat for wildlife species that utilize aspen. Prescribed fire and natural fire (including fire use) has and will benefit some wildlife species within the area by creating early successional stages and maintaining diversity in stand age and structure. The Monte Cristo prescribed burn has occurred within the project area. Overall, prescribed fire has had a minor effect on wildlife in the area. The majority of the forest type is old or mature. Past burns have benefited those species which prefer early successional stands. Prescribed fire and natural fire benefits some wildlife species by creating early successional stages and maintaining diversity in stand age and structure, beginning to restore a balance of successional stages, moving the district closer to properly functioning condition (PFC).

Recreation

Non-motorized trails usually have reduced or minor effects to wildlife species, though this is dependent on the amount and location of use. The amount of vegetation/habitat directly affected by a trail is very limited. Wisdom et al (2004) found that recreational activities have little difference in the measurable response during ATV, mountain biking, horse-riding, and hiking activities for mule deer. Wisdom et al (2004) found that recreational activities have a substantial effect on elk behavior and that the reactions of elk were more pronounced during ATV and mountain biking activities than those of horse-riding and hiking.

Past and proposed land exchanges typically have beneficial effects to wildlife species by consolidating lands into larger blocks, simplifying management and potential effects. In some of the past exchanges, the USFS has obtained more acres than exchanged which

usually benefits a greater number of species, though it is dependent upon on the specific habitat types being exchanged.

Urbanization and development along the Wasatch Front have affected wildlife species, especially big game species dependent on winter range habitat. The amount and quality of winter range for deer and elk is primarily the limiting factor for their populations. For some species, studies have shown a strong negative relationship between higher road density and species presence. The effects of urbanization and increased road densities within watersheds adjacent to USFS managed lands especially along the Wasatch Front have affected wildlife species and the movements of some species. Within some watersheds, road densities on private lands would likely exclude use by some forest carnivore species. Continued development of adjacent lands will likely influence big game populations and habitat within the Cache Harvest Unit and to a lesser extent within the Morgan/South Rich Harvest Unit.

Disturbance from motorized vehicles has affected wildlife species within the allotment area and is likely to increase with human population increases and the increased popularity of ATVs and snowmobiles. Big game and other wildlife usually will avoid or reduce the use of areas within approximately ¼ mile of travel ways.

Treatment of Noxious Weeds

Implementation of the WCNF Noxious Weed Management EIS will continue to improve vegetation/habitat conditions for wildlife species. Loss of valuable wildlife habitat (e.g. big game range, riparian habitat) to noxious weeds can affect a range of species. These projects will improve vegetation conditions and wildlife habitat, thus benefiting many wildlife species (e.g. neotropical birds).

Riparian Exclosures

The Wheeler Creek riparian exclosure located on the boundary of Bountiful and Dairy Ridge allotments was constructed to reduce livestock effects (primarily from cattle) within the spring, wet meadows, and riparian habitat. This project benefits a variety of species such as elk, deer, moose, beaver, small mammals, and a variety of neo-tropical birds.

Summary

The direct and indirect effects from grazing on wildlife relates primarily to effects on vegetation structure and composition. The effect of implementing the proposed action or the no action alternative varies by species and by the specific alternative as discussed above. As disclosed above, the effects would generally be minor and would not affect populations or trends. In all instances, effects of implementing the proposed action in combination with effects from past, on-going, and reasonable foreseeable future actions would not significantly affect wildlife species or their habitats.

Page intentionally left blank

Chapter 4 - Response to Comments

Letter/Comment Number	Comment	Response
1-a	I would recommend that the FS exclude sheep from the Monte Cristo Campground for a number of reasons. The first concerns conflicts with the public and their pets. The second is in order to establish an ungrazed reference area in aspen.	The purpose and need of this analysis is to authorize grazing that meets or moves towards the desired future condition. An ungrazed reference area for aspen is found in the Walter Mueggler RNA in Big Cottonwood Canyon.
1-b	I am not clear on the grazing practices conducted in the past and [those] proposed. A rotation system is suggested and grazing allowed in each pasture for 70 days. Are the 70 days split among four pastures? Or is grazing allowed from July 1 st through the end of September but grazing rotated among the pastures? It would help to have a better description of the grazing practices.	The period of use is specified in the grazing permit as a number of consecutive days within the grazing season for that allotment (i.e. for Blake Hollow, the permitted season is any consecutive 70 days between 7/1 and 9/30 each year). Under a rotation system, sheep are herded and systematically rotated through the each of the pastures, all to be completed within the 70-day grazing period. Under the rest rotation system, one pasture is rested entirely from grazing each year. Current grazing management and grazing systems are shown in Table 1 in Chapter 1. The proposed action would continue current management. It would include an adaptive strategy to allow for adjustments in grazing, if so indicated by monitoring.

<p>1-c</p>	<p>This document concludes, “It is expected that by continuing to follow this direction, rangelands will be maintained at or continue to move toward desired conditions.” Are there some areas that are not meeting desired conditions? Where are these?</p>	<p>The majority of the allotment is in satisfactory condition. There are a few isolated areas that are not in satisfactory condition. Section 3.3 of the EA identifies the area around Hatch Spring in the Bountiful allotment as not meeting ground cover standards. Section 3.3 also makes reference to historic bedgrounds lacking ground cover or diversity of species composition. These isolated areas are scattered across the project area.</p>
<p>1-d</p>	<p>The provided document claims that the Forest Service is meeting the obligations under multiple use. I don’t have with me the exact language of the law but will attempt to paraphrase it. Under multiple use, the Forest Service is required to manage the combination of all uses in a manner that prevents the impairment of the productivity of the lands. I would argue that the Forest Service has not determined what the productivity (in terms of range forage) and have not determined if the productivity is impaired or not. I ask that the Forest Service make that determination in this decision document and report which lands are impaired and how much the productivity is impaired if so determined.</p>	<p>Current rangeland monitoring indicates conditions on the allotments are satisfactory and trends are stable to upward on all the sheep allotments (EA, Section 3.3). The desired conditions, as described in the EA, Section 2.4, are indicative of healthy, productive rangelands. The proposed action would continue current management which is expected to maintain or improve rangeland conditions, maintaining or moving them toward desired conditions. Grazing utilization standards, incorporated into the terms and conditions of grazing permits, are designed to maintain the productivity of rangelands. The analysis has shown (EA, Chapter 3) there would be no impairment of productivity of the land under continued grazing.</p>

<p>1-e</p>	<p>This is based on my experience growing [up] in this area and visiting this site a number of times. Compared with similar sites that are ungrazed, the productivity of this allotment is significantly reduced from its potential. This is further corroborated by comparing current conditions in the allotment with range site descriptions that show these kinds of habitat (aspen and sagebrush) at their potential.</p>	<p>Monitoring indicates stable to upward trends in both the aspen and the sagebrush vegetation cover types. See EA, Section 3.3 and the rangeland specialist report for more information on range trend analysis.</p>
<p>1-f</p>	<p>By design, both the forest plan, grazing monitoring methods, and analysis fail to capture common ecological impairments on forest lands. For example aspen recruitment has been a problem in these allotments based on my visits to these areas. Compared with sites at their potential, these allotments show that there are an inadequate number of aspen trees in the under six foot height class. Over utilization by wild[life] and livestock are the most likely reason</p>	<p>Photos from the 2009 field season indicate successful aspen regeneration within portions of the allotments (photos available in the project record). However, the analysis of grazing authorization at the project level is not the appropriate scale for evaluation of aspen ecosystems. Aspen regeneration is more appropriately addressed at the landscape scale, and was addressed in Forest Plan guideline 14. This directs us to have a balanced range of seral stages within the landscape. This direction has been included in the Management Requirements, Section 2.5.1 of the EA.</p>
<p>1-g</p>	<p>We hope to visit this allotment this fall and would like to have you join us as we conduct a survey of aspen regeneration using methods developed by Dr. Mary O'Brien. Let me know if you would like to attend.</p>	<p>Thank you for your invitation.</p>

<p>1-h</p>	<p>As mentioned earlier, monitoring practiced in the past does not collect information on plant annual production. As a result, it is not possible [to] assess if the multiple use requirements are met or not. Similarly, it is not possible to conduct grazing capacity analysis without such data.</p>	<p>Grazing capacity is determined by utilization levels, not production. The actual grazing capacity of the allotment is determined based on the results of both effectiveness and implementation monitoring. Range trend studies on both uplands and riparian areas will be reread (every 10 years or so) to determine the effectiveness of the allotment management. Monitoring of livestock use on forage is done annually not to exceed Forest Plan allowable use standards. The combination of these two types of data is used to determine the actual capacity of the allotment. Please see the EA, Section 3.3 and the rangeland specialist report.</p>
<p>1-i</p>	<p>There is good reason to believe the overgrazing continues to occur in these allotments. Monitoring conducted by Ron Younger, a retired grazing expert shows that stubble height monitoring used by the Forest Service showed overgrazing was occurring. This information was ignored in this decision as were all other comments submitted by the public in past years about problems with this allotment. The absence of any mention of past communication with the public underscores a recurring serious problem where the Forest Service ignores and fails to act on key information. This has happened so often that I must conclude that there is an institutional problem that is both unprofessional and in conflict with the intent of the agency to work with the public.</p>	<p>The Forest Service accepts monitoring from other sources only when a monitoring agreement is in place. While the FS only accepts monitoring methods described in the FS Handbook, other monitoring efforts conducted on the allotments may help inform analysis of conditions on the allotments.</p>

<p>1-j</p>	<p>Bare ground exceeds that which should be found in sagebrush communities in these allotments. I have not conducted surveys but expect to find that this is much higher than 15% as claimed. Except for turned soil from animal actions, there should be almost no bare ground for sagebrush communities at their potential.</p>	<p>The EA, Section 3.5 and the soils technical report indicate all sheep allotments meet the requirements for the Forest Plan cover types represented. Hatch Springs on the Bountiful Allotment has indicated ground cover less than Forest Plan standard (related to sheep bed grounds); this is addressed in the mitigation measure requiring bedgrounds to be at least ¼ mile away from seeps, springs, ponds, and live water. Vegetation and litter covered 55 to 86 % of the transects. Bare soil associated with gopher activity ranged from 8 to 29% of the transect sample points. A very small amount of the sample points (0 to 8%) contained bare soil that could not be associated with any specific causative agent. The data indicate ground cover is adequate across the majority of all the allotments (see EA, Section 3.5).</p>
<p>1-k</p>	<p>Where do we go from here? We need to conduct range capacity analysis. This will give us a starting place for stocking numbers.</p>	<p>The Forest Service monitors utilization levels to determine proper stocking and grazing capacity. Please see the EA, Section 3.3.</p>

<p>1-l</p>	<p>Public involvement in range decisions continues to decline. The purpose of this decision is to conduct a clerical renewal of a grazing permit. Grazing decisions are then to be crafted outside, monitored, and assessed all outside public participation. If the land was at its potential, this would not be a problem. But it is not.</p>	<p>A concerted effort has been made to involve the public throughout the environmental analysis. In March 2009, the proposal was provided to the public and other agencies for comment during the scoping period. The project was included in the Spring 2009 Schedule of Proposed Actions (SOPA). Three comment letters were received during scoping from which the interdisciplinary team refined the list of issues. Also, as a result of input received during scoping, the proposed action was revised. The proposed action and alternatives were provided to the public and other agencies for notice and comment starting on July 3, 2009. Three written letters and one oral comment were received. See EA, Chapter 1, Public Involvement.</p>
<p>1-m</p>	<p>The alternative suggested is inadequate because the habitat is not as stated. It does not meet Forest Service requirements and is today significantly impaired. I recommend that the Forest Service recognize this and then design a grazing program to remedy this problem. I understand that this will take a number of steps. Let those begin now.</p>	<p>Current rangeland monitoring indicates conditions on the allotments are satisfactory and trends are stable to upward on all of the sheep allotments (EA, Section 3.3, Rangeland Resources). Monitoring has been conducted in aspen, sagebrush, and riparian habitats. See Section 3.3 and the rangeland specialist report for more information on range trend analysis. See EA, Section 3.5, Soils, and the soils specialist report for more information on ground cover.</p>

<p>1-n</p>	<p>You should consider an alternative that uses the grazing response index to yield positive results each year. To do this, one week and or more should be scheduled for each pasture. I ask that this be considered as an alternative. If you have any questions, I would be happy to help.</p>	<p>The grazing response index (GRI) is not the agency-accepted monitoring method as recognized in the R4 monitoring handbook. Although not specifically used for monitoring of these allotments, the proposed action (current management) defers grazing on portions of the allotments and is consistent with the principles of the Grazing Response Index (GRI) developed by Colorado State University.</p>
<p>2-a</p>	<p>Dry Bread allotment seems to have high sheep numbers relative to fairly low acres in size. He wondered why the density was so high, and offered a concern that the density is too high in Dry Bread allotment. There are many things in this area (the highway, camping areas, ATV trails) forcing sheep into a smaller area, resulting in higher sheep density per acre.</p>	<p>The Forest Service monitors utilization levels to determine proper stocking and grazing capacity. Please see the EA, Section 3.3. Current rangeland monitoring indicates conditions on all of these sheep allotments are satisfactory and trends are stable to upward on all of the sheep allotments, indicating proper stocking levels. The cumulative effects of sheep grazing in combination with other on-going actions, such as ATV use, is addressed in the cumulative effects sections of the EA, Chapter 3.</p>
<p>2-b</p>	<p>The Forest Service should analyze actual grazing use numbers that occurred during the term of the permit, not the permitted numbers.</p>	<p>The data collected during field visits is used to assess rangeland conditions on the ground, indicating effects of actual grazing use numbers. The Forest Service monitors utilization levels to determine proper stocking and grazing capacity. Please see the EA, Section 3.3, Rangeland Resources.</p>

<p>3-a</p>	<p>Being a cornerstone of the scoping process alternative development is very important for environmental assessments (EAs). The scoping comment solicitation letter explains that, thus far, two alternatives are going to be considered: the proposed action to continue current grazing management, and a no action alternative that would phase grazing out in a three year period. We believe it is appropriate to treat the no grazing alternative as the no action alternative. Additionally, UEC endorses this alternative and supports phasing the sheep grazing out on these allotments.</p>	<p>Thank you for your comment.</p>
<p>3-b</p>	<p>Noted in the scoping comment solicitation letter, not all of the acreage inside these allotments currently meet standards and guidelines in the LRMP. The proposed action is described as presuming to move towards compliance with that direction. We do not believe that is good enough for several reasons. First, standards and guidelines are not aspirational components of the LRMP; they are management sideboards not to be exceeded. Desired Future Conditions are the aspirational component of the plan; that's what you're supposed to move towards. However there are never times when it is acceptable to not meet LRMP standards and guides. An action alternative that can guarantee compliance with LRMP standards and guidelines immediately or within one year has to be developed. The proposed action must be designed from the bottom-up to ensure that you result in immediate LRMP compliance. We don't think you should be allowing domestic livestock grazing anywhere where this is not the case.</p>	<p>Current rangeland monitoring indicates conditions on the allotments are satisfactory and trends are stable to upward on all the sheep allotments (EA, Section 3.3). Grazing utilization standards, incorporated into the terms and conditions of grazing permits, are designed to maintain the productivity of rangelands. The analysis has shown (EA, Chapter 3) the LRMP standards and guidelines would be met and satisfactory rangelands would be maintained or improved under continued grazing.</p>

<p>3-c</p>	<p>"In UEC v Troyer the 10th Circuit found that the 1982 NFMA regulations apply to projects implementing the Uinta and Wasatch-Cache LRMPs, due to the active decision to apply and go with the 1982 rules in the 2003 LRMP EIS/ROD, well after subsequent NFMA regulations had been issued (but not used). UEC v Troyer, 479 F.3d 1269, 10th Cir. 2007. The Forest is required by 36 CFR section 219.19 and 219.27 (1982) to monitor populations of all native and desirable non-native species to ensure that adequate habitat and viable populations are maintained. The 2003 Wasatch-Cache Forest Plan explicitly cites and incorporates the 1982 NFMA regulations, so they will need to be applied in the analysis and review of this decision.</p>	<p>The monitoring requirements for wildlife are those included in our LRMP. The Department has determined that the transition provision of the 2000 planning rule is currently in effect (WO letter, July 17, 2009). Effects on wildlife from continued sheep grazing on these allotments are fully documented in the EA, Section 3.7.</p>
<p>3-d</p>	<p>USDA Departmental Regulation 9500-4, which is in effect today, provides further direction to the Forest Service, expanding the viability requirements to include plant species: "Habitats for all existing native and desired non-native plants, fish, and wildlife species will be managed to maintain at least viable populations of such species. In achieving this objective, habitat must be provided for the number and distribution of reproductive individuals to ensure the continued existence of a species throughout its geographic range ... Monitoring activities will be conducted to determine results in meeting population and habitat goals."</p> <p>This is a project and proposed action that proposes to directly, indirectly, and cumulatively impact wildlife individuals and populations significantly as well as (through permitted grazing) to manipulate and alter major structural components of wildlife habitat, alter soil stability and change the vegetative cover. Before doing this significant action, the Forest needs to modify the proposed action such that it will not reduce native plant and animal</p>	<p>Effects on wildlife from continued sheep grazing on these allotments are fully documented in the EA, Section 3.7. Effects on rare plants and vegetation are disclosed in the EA, Section 1.9.1, Rare Plants, and Section 3.3, Rangeland Resources, respectively. Fish surveys have been conducted on all fish bearing streams within the allotments in 2000 and 2006; Sensitive species viability is discussed in the EA (Section 3.2 and the aquatic specialist report).</p>

	<p>populations and distributions to less than the minimum.</p>	
<p>3-e</p>	<p>Since habitat for mollusks, amphibians and tall forbs are directly impacted by current and proposed grazing levels, the Forest needs to modify the proposed action such that it address and resolves all direct and indirect impacts to mollusks, native amphibians and tall forb communities and their habitat.</p>	<p>The proposed action meets forest plan standards relative to mollusks, amphibians and tall forbs. Bonneville cutthroat trout are the management indicator species for aquatic habitats. Population information and sensitive species viability are discussed in the EA, Section 3.2 (also see aquatics specialist report). Amphibian surveys have been conducted throughout these allotments and are discussed in the EA, Section 3.2 (also see aquatics specialist report).</p>
<p>3-f</p>	<p>There also needs to be a rigorous presentation and analysis of the effects to TES and proposed sensitive flora and fauna. Original surveys should be conducted in the project area. These issues should be treated as driving issues that inform the development of the proposed action and alternatives.</p>	<p>Fish surveys have been conducted on all fish bearing streams within the allotments in 2001 and 2006 (see aquatics specialist report). Grazing effects to aquatic species are discussed in the EA, Section 3.2.</p>

<p>3-g</p>	<p>There is a lot of aspen in these allotment areas, and there may be a good amount of willow (we are not sure of the willow, however). Grazing reduces the density and vigor of grasses which often out-compete tree seedlings, leading to dense stands of fire-prone small trees. This is a significant issue that needs to be used to drive alternative development. We believe that domestic livestock grazing impacts on aspen and willow regeneration needs to be identified as a significant issue that is carried forward in the EA analysis, and used to drive the development of an alternative that focuses on avoiding impacts to willow and aspen community health.</p>	<p>Willow and aspen are important parts of the allotment vegetation and monitoring indicates both are in satisfactory condition (EA, Section 3.3). Photos from the 2009 field season and information in the rangeland specialist report indicate successful aspen regeneration over much of the allotment (photos available in the project record). However, the primary issue of aspen regeneration is not grazing, but the incidence of stand-replacing events (such as fire) and management that will allow regeneration of the existing clones. The analysis of grazing authorization at the project level is not the appropriate scale for evaluation of aspen ecosystems. Aspen regeneration is more appropriately addressed at the landscape scale, as described in the Management Requirements, Section 2.5.1 of the EA.</p>
<p>3-h</p>	<p>Bartos and Campbell (1998b) noted a 60% decline in aspen in the six National Forests in Utah. They state: "Changes in the abundance of aspen dominated landscapes have occurred over the past 125+ years partly as a result of livestock grazing, wildlife use and a reduction in fires. The historical fire regime was altered in the mid-1800's after European settlement. Fire exclusion resulted from a combination of excessive grazing, timbering, and people extinguishing wildland fires. Grazing removed the fine fuels which generally carried the fires."</p>	<p>Existing conditions involve many factors and are a result of the number of years since last disturbance (such as fire), drought, site conditions, ungulate grazing, and other factors. Bartos encourages recognition of the factors that affect the condition and reestablishment of aspen and encourages management of aspen communities appropriately based on their location and interaction with other aspects of the environment. However, the primary issue of aspen regeneration is not grazing, but the</p>

		<p>incidence of stand-replacing events (such as fire) and management that will allow regeneration of the existing clones. The analysis of grazing authorization at the project level is not the appropriate scale for evaluation of aspen ecosystems. Aspen regeneration is more appropriately addressed at the landscape scale, as described in the Management Requirements, Section 2.5.1 of the EA.</p>
3-i	<p>In another study, Bartos and Campbell (1998a), using figures from research by Gifford et al (1984) noted 2.83 inches of water lost when fir forests replace aspen and 7.32 inches lost when spruce replaced aspen, the authors calculated that 250 to 500 acre-feet of water/1,000 acres was lost through transpiration annually, depending on the conifer species replacing aspen. Since about 1.5 million acres of aspen have been converted to conifers in Utah, this translates to an annual loss of water for stream flow and plant production of 375,000 to 750,000 acre-feet per year.</p>	<p>Although this is important information regarding aspen communities, the analysis of grazing authorization at the project level (the scope of this environmental analysis) is not the appropriate scale for evaluation of aspen ecosystems. Aspen regeneration is more appropriately addressed at the landscape scale, as described in the Management Requirements, Section 2.5.1 of the EA.</p>
3-j	<p>Wambolt et al (2001) studied long-term recovery of big sagebrush habitats in southwestern Montana following prescribed fire. One aspect of their study involved characterization of the perennial grass cover for these areas. In the unburned sites they studied, perennial grass cover averaged 45.6%, ranging from 20.1% to 61.7%. Welch (in press) measured big sagebrush canopy cover, perennial grass cover and bare ground in 14 ungrazed kapukas in southern Idaho during 2000. He found sagebrush canopy cover ranged from 14 to 31% with a mean of 23.6%. Perennial grass cover ranged from 29 to 58% with a mean of 43.5%. Bare ground</p>	<p>The information provided was taken into consideration in the effects analysis disclosed in the EA, Chapter 3.</p>

	<p>ranged from 1 – 21% with a mean of 8.6%.</p>	
<p>3-k</p>	<p>Aspen decline and lack of successful aspen regeneration are well known problems on this National Forest, and on this Ranger District. We believe that this is also the case across the Monte Cristo area. The cumulative effects of permitted livestock grazing in this section of the Monte Cristo Range significantly impact and impair the ability of aspen forests to perpetuate. The proposed action does not address this conflict among alternative uses of the available resources. In light of the above, we believe that an action alternative needs to be developed that includes:</p> <ul style="list-style-type: none"> • Identification of each pasture in the analysis area that has inadequate aspen stems in the 1 to 5 foot height classes. (These are the classes most heavily impacted by sheep grazing.) • Rest from domestic grazing for each such pasture until a new cohort of aspen moves through this height class and reaches 5 feet. • Adaptively manage rest/use of each pasture after that in light of continued monitoring of aspen recruitment in the 1-5 foot height class. 	<p>Requiring a specific number of aspen trees in the under 6-foot height class is not part of forest plan direction. As included above, aspen regeneration is more appropriately addressed at the landscape scale, and was addressed in Forest Plan guideline 14. This directs us to have a balanced range of seral stages within the landscape. This direction has been included in the Management Requirements, Section 2.5.1 of the EA.</p>

<p>3-1</p>	<p>We recommend the Forest conduct a rigorous evaluation using the newest data and research to minimize impacts to migratory birds (and their habitat), including a focus on species on the 2002 List of Birds of Conservation Concern and species that are listed among the Partner's in Flight Priority Species. To help meet responsibilities under Executive Order 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds), the UEC recommends that you conduct activities outside critical breeding seasons for migratory birds, minimize temporary and long-term habitat losses, and mitigate all unavoidable habitat losses. If some portion of your mitigation includes off-site habitat enhancement, it should be in-kind and either within the watershed of the impacted habitat or within the foraging range of the habitat-dependent species.</p>	<p>Effects on migratory birds from continued sheep grazing on these allotments are fully documented in the EA, Section 3.7. As indicated in the effects analysis, adequate habitat for migratory birds will be maintained.</p>
<p>3-m</p>	<p>Lynx have crossed this National Forest a number of times in the last few years, and are likely to use the habitat in the allotments in the coming years as they continue to disperse from north of this identified Lynx Corridor, as well as from the south (from the CO populations). We encourage the Forest to implement mitigation measures in the proposed action that significantly exceed the LCAS standards and guidelines, as if this was formal LAU. This is particularly important because the LCAS standards and guidelines are not sufficient in and of themselves to ensure that an effective program to recover this species and habitat actually occurs on the Forest, as required by the ESA. As indicated in the LCAS, domestic grazing pressures on lynx habitat are known to be negative and substantial.</p>	<p>The effects to the Canada lynx from continued sheep grazing on these allotments is disclosed in the EA, Section 3.7. A determination of "not likely to adversely affect" was made and documented in the Biological Assessment. The US Fish and Wildlife Service concurred with this determination in a letter dated September 8, 2009 (available in the project record).</p>

<p>3-n</p>	<p>We [UEC] do believe that the issues and concerns surrounding the project are substantial enough to merit circulating the EA for the public to read or comment on prior to the issuance of a final decision. Doing this goes towards involving the public in the preparation of your EAs to the greatest extent practicable. In the big picture, doing this is certainly reasonable and fair, and we believes it works to promote better decision-making.</p>	<p>The public was provided two opportunities for involvement in this environmental analysis. Preliminary information was provided during scoping. Respondents' concerns were considered in identifying issues. Later, an opportunity for comment was provided when the proposed action, alternative, and issues had been further developed by the interdisciplinary team. Public comments were considered, incorporated into the analysis as appropriate, and responded to in Chapter 4, the Response to Comments. We believe these to be appropriate times for the public to provide early and meaningful input.</p>
<p>4-a</p>	<p>Any listing of fundamental issues for environmental analysis should include water quality and management indicator species. The soil stability issue should also be expanded to include a wider range of soil factors such as: infiltration, fertility, and cryptobiotic crust.</p>	<p>Effects on water quality are disclosed in the EA, Section 3.6, stating "for the waters draining these watersheds, the State of Utah has determined that all assessed classes are meeting the beneficial uses." Field visits verified water in the streams ran clear. Effects to MIS wildlife (northern goshawk, snowshoe hare, and beaver) are disclosed in the EA, Section 3.7, denoting there will be no significant effects. The Bonneville cutthroat trout, a Forest MIS species, is discussed in Section 3.2, where it states there will be no effect on population trend from the proposed action. The EA discloses effects to soil quality in Section 3.5; the discussion includes assessment of ground cover, soil erosion rates, and soil porosity/infiltration. Regarding</p>

		<p>cryptobiotic crust, several authors (Belnap and others, 2001, Kaltenecker and others, 1994) note that mountain big sagebrush sites tend to lack significant biological crust cover because of typically dense vascular plant cover and litter; crusts are unlikely in these habitat types on gravelly soils in higher precipitation zones with high graminoid and forb cover, like those found within these allotments.</p>
<p>4-b</p>	<p>The consideration of only two alternatives is too narrowly drawn to allow meaningful evaluation of a 'hard-look' of issues in the later EA. There are other grazing regimes than the one proposed in your scoping paper.</p>	<p>The data indicates current grazing management is meeting or moving toward desired future conditions. The range of alternatives, including those considered in detail and eliminated from further study for the reasons documented in the EA, adequately address the issues listed in in the EA, Section 1.8. Furthermore, the proposed action includes an adaptive strategy to allow for adjustments in grazing management, such as different grazing regimes you are referring to, if monitoring indicates a need for change in the future.</p>
<p>4-c</p>	<p>I think it would be helpful if the District Ranger would conduct a field trip of the Monte Cristo Sheep Allotments.</p>	<p>Thank you for your suggestion. Public involvement in the NEPA process is welcomed and encouraged.</p>

References

Aquatics References

- Armour, C., D. Duff, and W. Elmore. 1994. The effects of livestock grazing on western riparian and stream ecosystem. *Fisheries* 19(9):9-12.
- Belsky, A. J., A. Matzke, and S. Uselman. 1999. Survey of livestock influences on stream and riparian ecosystems in the western United States. *Journal of Water Conservation* 54:419-431.
- Chase, P. 2001. Effects of Cattle Grazing on Riparian Areas and Fish Populations. A literature review conducted for the Wasatch-Cache National Forest.
- Fleischner, T. L. 1994. Ecological costs of livestock grazing in Western North America. *Conservation Biology* 8:629-644.
- Gregory, J. S. and B. L. Gammet. 2009. Cattle Trampling of Simulated Bull Trout Redds. *North American Journal of Fisheries Management* 29:361-366.
- Platts, W. S. and R. L. Nelson. 1985. Stream habitat and fisheries response to livestock grazing and instream improvement structures, Big Creek, Utah. *Journal of Soil and Water Conservation* 40:374-379.
- Rinne, J. N. 1999. Fish and grazing relationships: The facts and some pleas. *Fisheries* 24(8):12-21.
- Roath, L. R. and W. C. Krueger. 1982. Cattle grazing and behavior on a forested range. *Journal of Range Management* 35:332-338.
- Thompson, P. and P. Chase. 2001. Boreal Toad (*Bufo boreas boreas*) Distributional Surveys and Monitoring in Northern Utah, 1999-2001. Publication Number 01-27. Utah Division of Wildlife Resources. Salt Lake City, Utah.
- Thompson, P. and P. Chase. 2003. Boreal Toad (*Bufo boreas boreas*) Distributional Surveys and Monitoring in Northern Utah, 2003. Publication Number 03-43. Utah Division of Wildlife Resources. Salt Lake City, Utah.
- Thompson, P. and P. Chase. 2005. Boreal Toad (*Bufo boreas boreas*) Distributional Surveys and Monitoring in Northern Utah, 2004. Publication Number 01-27. Utah Division of Wildlife Resources. Salt Lake City, Utah.
- Thompson, P., P. Chase and B. Nadolski. 2003. Boreal Toad (*Bufo boreas boreas*) and Spotted Frog (*Rana leteiventris*) Distributional Surveys and Monitoring in Northern Utah, 2002. Publication Number 03-02. Utah Division of Wildlife Resources. Salt Lake City, Utah.

Wasatch-Cache National Forest. 2008. Management Indicator Species of the Wasatch-Cache National Forest. Salt Lake City, Utah Version 2008-1.

USDA Forest Service, 2007. Assessment of Management Indicator Species Capability and Suitability on the Wasatch-Cache National Forest with the Management and Restoration Direction.

Noxious Weeds References

USDA, FS. 1989. Threatened, Endangered, and Sensitive Plant Program Action Plan. Forest Service Intermountain Region. Ogden, Utah.

USDA, FS. 1999. Endangered, Threatened and Sensitive Species of the Ashley, Uinta and Wasatch-Cache National Forests (Northern Utah Ecoregion). Wasatch-Cache National Forest. Salt Lake City, Utah.

Utah Natural Heritage Program (UNHP). 2003. Element Occurrence Database. Utah Division of Wildlife Resources. Salt Lake City, Utah.

Welsh, S.L., N.D. Atwood, S. Goodrich and L.C. Higgins. 1993. A Utah Flora (2nd ed., revised). Brigham Young University. Provo, Utah.

USDA Forest Service. 2003a. Invasive Species Management Program National Cohesive Strategy Core Outline.

USDA Forest Service. 2003b. Revised Forest Plan Wasatch-Cache National Forest.

USDA Forest Service. 2005. Wasatch Cache National Forest Integrated Weed Strategy. Wasatch-Cache National Forest. Salt Lake City, Utah.

USDA Forest Service. 2005. Noxious Weed Treatment EIS. Wasatch-Cache National Forest. Salt Lake City, Utah.

USDA Forest Service. 2005. Threatened, Endangered, and Sensitive Plants Survey Field Guide. USDA FS Rangeland Management Staff. Washington, DC.

Rangeland Resource References

Heady, H.F. and R. D. Child. 1994. Rangeland Ecology and Management. Westview Press, Boulder, Co. 519 pp

Laycock, W.A. Stable States and Thresholds of Range Condition on North American Rangelands: A Viewpoint. Journal of Range Management. Vol. 44, No. 5 (September 1991) pp. 427-433.

District 2210 Allotment Analysis and Plans files stored at the district office.

Recreation References

USDA Forest Service, 2003a. *Wasatch Cache National Forest Land and Resource Management Plan*. Appendix VII. Revised 2003.

USDA Forest Service 2007 Ogden Ranger District Travel Plan Revision Record of Decision and Final Environmental Impact Statement including Supplemental EIS

Soils References

Flood, P. 2008a. *Soil Condition Evaluation Monitoring, Blake Hollow, Bountiful, Dry Bread, and Little Monte Sheep Allotments*. Unpublished report on file at: U.S. Department of Agriculture, Forest Service, Uinta-Wasatch-Cache National Forest. October, 2008.

Goodrich, S. 2006-PG. *Distribution and abundance of pocket gophers in the Uinta Mountains in context of livestock grazing and other factors*. Unpublished report on file at: U.S. Department of Agriculture, Forest Service, Ashley National Forest.

Leytem, April B. and Steven S. Seefeldt. Impact of Sheep Bedding on Soil Nutrient Dynamics in the Centennial Mountains of Montana and Idaho. *Soil Science*. Volume 173, No. 8. August, 2008.

USDA NRCS. 1980. *Soil Survey of Morgan Area, Utah. Morgan County and Eastern Part of Weber County*. USDA Natural Resources Conservation Service. Salt Lake City, Utah.

USDA NRCS. 1982. *Soil Survey for Rich County Utah*. USDA Natural Resources Conservation Service. Salt Lake City, Utah.

USDA Forest Service, 2003. *Soil Management Handbook*. FSH 2509.18. Region 4 Supplement r4_2509.18-2002-1. U.S. Department of Agriculture, Forest Service, Intermountain Region, Ogden, UT. January, 2003.

USDA Forest Service, 2003a. *Wasatch Cache National Forest Land and Resource Management Plan*. Appendix VII. Revised 2003.

USDA Forest Service, 2004a. *Forest Plan Monitoring*. Wasatch Cache National Forest. First Year Report. Section 5, pp16-20. March 2003-March 2004.

Water References

Anderson, E. William. 1974. Indicators of Movement on Range Watersheds. *Journal of Range Management* 27(3), May 1974.

Ashcroft, Gaylen L., Jensen, Donald T. and Jeffrey L. Brown. 1992. Utah Climate. Utah Climate Center, Utah State University, Logan ,UT.

NOAA. 2009a. Annual precipitation for Stillwater allotment from National Atlas of Precipitation at website: http://www.nationalatlas.gov/printable/images/pdf/precip/pageprecip_ut3.pdf

NOAA 2009b. Precipitation frequency estimate from NOAA atlas 14 for Stillwater allotment. Website :http://hdsc.nws.noaa.gov/hdsc/pfds/sa/ut_pfds.html

Utah, State of. 2006a. *Standards of Quality of Waters of the State*, Section R317-2, Utah Administrative Code. Utah Department of Environmental Quality, Division of Water Quality.

Utah, State of. 2006b. Utah Water Quality Assessment Report to Congress 2006. Utah Department of Environmental Quality, Division of Water Quality.

USDA Forest Service. 2003b. Wasatch-Cache National Forest Plan, Chapter 4. USDA Forest Service.

USEPA. 2003. National management measures for the control of nonpoint pollution from agriculture. EPA-841-B-03-004. U.S. Environmental Protection Agency, Office of Water Washington, D.C. 20460. (Last visited April 19, 2004) <http://www.epa.gov/owow/nps/agmm/>

Wildlife References

Adams, L. 1959. An analysis of a population of snowshoe hares in northwestern Montana. *Ecological Monographs* 29: 141-170.

Bissonette, J. A., L. J. Christiansen, and N. H. Smith. 1995. Final report Franklin Basin (UT, ID) wolverine survey. Conducted for U. S. Forest Service, Caribou National Forest and Uinta and Wasatch-Cache National Forests, Idaho Department of Fish and Game and Utah Division of Wildlife Resources.

Blackwell, B. H., Pederson, J. C. 1993, February 19. Beaver Distribution, Habitat and Population Survey (1971-1982) Project Summary and Recommendations for Action. Utah Division of Wildlife Resources, Salt Lake City, Utah.

Cherry, Steve 1981. 1981 Small Mammal Survey-Big Creek. Letter to Jack Brown, BRRA Wildlife Management Biologist. Department of the Interior, Bureau of Land Management. 3 pp.

Douglass, R.J. and M.R. Frisina. 1993. Mice and management on the Mount Haggin wildlife management area. *Rangelands* Vol. 15(1).

Graham, R.T., R.L. Rodriguez, K. M. Paulin, R. L. Player, A. P. Heap, and R. Williams. 1999. The northern goshawk in Utah: Habitat assessment and management recommendations. USDA Forest Service General Technical Report Rocky Mountain Research Station, GTR-22.

- Hasenyager, R. N. 1980. Bats of Utah. Utah State Division of Wildlife Resources, Publication 80-15, 1-109pp.
- Hayward, G. D. and J. Verner, tech. editors. 1994. Flammulated, boreal, and great gray owls in the United States: A technical conservation assessment. Gen. Tech. Rep. RM-253. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experimental Station. 214 p. 3 maps.
- Heinowski, A. 1982. 1982 Small Mammal Survey – Big Creek.
- Hill, Rebecca L. 2000. Suggestions for conservation of the three-toed woodpecker (*Picoides tridactylus*). Fishlake National Forest, Richfield Ranger District. 13 pp.
- Hodges, K.E. 2000. The ecology of snowshoe hares in northern boreal forests. Chapter 6 *In*: Ruggiero, L.F., K. B. Aubry, S. W. Buskirk, et al., tech. eds. Ecology and conservation of lynx in the United States. Univ. Press of Colorado. Boulder, CO. 480 p.
- Johnson, M. 1982. Response of small mammals to livestock grazing in southcentral Idaho. *Journal of Range Management* Vol. 35(1).
- Litvaitis, J., A. Sherbourne, and J.A. Bissonette. 1985. Influence of understory characteristics on snowshoe hare habitat use and density. *Journal of Wildlife Management* 49: 866-873.
- McCluskey, D.C. 1978. Riparian Zone Inventory Report.
- Medin, D. and W. Clary. 1990. Bird and small mammal populations in a grazed and ungrazed riparian habitat in Idaho. Research Paper INT-425. USDA Forest Service, Intermountain Research Station.
- Mika, M. 2000 personal communication between M.Mika and S.Blatt.
- Mika, M. 2003. Prey base differences and reproductive output of flammulated owls (*Otus flammeolus*) in northern Utah. Manuscript of a journal article submitted to the faculty of Brigham Young University in partial fulfillment of the requirements for the degree of Master of Science, Brigham Young University, Provo, Utah.
- Murray, D. L., J. D. Roth, E. Ellsworth, A. J. Wirsing, and T. D. Steury. 2002 Estimating low-density snowshoe hare populations using fecal pellet counts. *Can. J. Zool.* 80:771-781.)
- Oliver, G.V. 2000. The bats of Utah: A literature review. Utah Department of Wildlife Resources. Salt Lake City, Utah. Publication No. 00-14.
- Olson, R. and W.A. Hubert. 1994. Beaver: Water resources and riparian habitat manager. University of Wyoming.
- Parrish, J. R., F. P. Howe, R. E. Norvell. 2002. Utah Partners in Flight Avian Conservation Strategy Version 2.0. Utah Partners in Flight Program, Utah Division of Wildlife Resources,

1594 West North Temple, Salt Lake City, UT 84116, UDWR Publication Number 02-27. i–xiv + 302 pp.

Reynolds, R.T., R.T. Graham, M.H. Reiser, R.L. Bassett, P.L. Kennedy, D.A. Boyce, G. Goodwin, R. Smith, and E.L. Fisher. 1992. Management Recommendations for the Northern Goshawk in the Southwestern United States. USDA Forest Service General Technical Report RM-217.

Ruediger, B, J. Claar, S. Gniadek, L. Lewis, B. Holt, S. Mighton, B. Naney, G. Patton, T. Rinaldi, J. Trick, A. Vandehey, F. Wahl, N. Warren, D. Wenger, A. Williamson. 2000. Canada Lynx Conservation Assessment and Strategy. 2nd ed. USDA Forest Service, USDI Fish and Wildlife Service, Bureau Land Management, and National Park Service. Forest Service Publ. #R1-00-53. 142 pp.

Ruediger, Bill, Jim Claar, Steve Gniadek, Bryon Holt, Lyle Lewis, Steve Mighton, Bob Naney, Gary Patton, Tony Rinaldi, Joel Trick, Anne Vandehey, Fred Wahl, Nancy Warren, Dick Wenger, and Al Williamson. 2002. Canada lynx conservation assessment and strategy. USDA Forest Service, USDI Fish and Wildlife Service, USDI Bureau of Land Management, and USDI National Park Service. Missoula, MT.

Ruggiero, L.F., K.B. Aubry, S.W. Buskirk, L.J. Lyon, W.J. Zielinski; tech. eds. 1994. The scientific basis for conserving forest carnivores: American marten, fisher, lynx and wolverine in the western United States. Gen. Tech. Rep. RM-254. Ft. Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 184 p

USDA Forest Service. 1994. American Marten, Fisher, Lynx, and Wolverine in the Western United States, The Scientific Basis for Conserving Forest Carnivores. Rocky Mountain Forest and Range Experiment Station, Forest Service, Fort Collins Colorado. General Technical Report RM-254.

Uinta-Wasatch-Cache National Forest. 2008. Management Indicator Species of the Wasatch-Cache National Forest Planning Area. Salt Lake City, Utah Version 2008-1

USDA Forest Service. 2000. Goshawk EA, ROD, and Associated Documents:
<http://www.fs.fed.us/r4/goshawk>

USDA Forest Service. 2002. Report to GYCC. Wolverine natal denning habitat mapping and field surveys, Caribou-Targhee National Forest.

USDA Forest Service. 2003. Revised Forest Plan, FEIS, and Record of Decision, Wasatch-Cache National Forest. Salt Lake City, Utah.

USDA Forest Service. 2003a. Biological Assessment/Evaluation for the Forest Plan Revision Wasatch-Cache National Forest, Uinta-Wasatch-Cache National Forest. Salt Lake City, Utah.

- USDA Forest Service. 2003b. Final Environmental Impact Statement for the Land and Resource Management Plan for the Uinta National Forest. Appendices – Volume 1: Appendix E: Biological Assessment and Biological Evaluation.
- USDA Forest Service. 2007. Ogden Ranger District Travel Plan Revision, Record of Decision and FEIS. Wasatch-Cache National Forest, Ogden, Utah.
- USDA Forest Service. 2007a. Assessment of management indicator species capability and suitability on the Wasatch-Cache National Forest with the management and restoration direction. Wasatch-Cache National Forest. Salt Lake City, Utah.
- USDA Forest Service. 2009. Intermountain Region (R4) Proposed, Endangered, Threatened, and Sensitive Species Know/Suspected distribution by Forest. Intermountain Region. Ogden, Utah.
- USDI Fish and Wildlife Service. 1998. Endangered and Threatened Wildlife and Plants; Notice of 12-Month Finding on a Petition To List the Northern Goshawk in the Contiguous United States West of the 100th Meridian/Vol. 63, No. 124 /Monday, June 29, 1998
- USDI Fish and Wildlife Service. 2002. Letter to Tom Tidwell from Henry Maddox regarding Canada lynx habitat and Lynx Analysis Unit. November 6, 2002.
- USDI Fish and Wildlife Service. 2003. Endangered and Threatened Wildlife and Plants; 90-day Finding for a Petition to List as Endangered or Threatened Wolverine in the Contiguous United States. Federal Register. Volume 68, Number 203, October, 21, 2003, pp 60112-60115)
- USDI Fish and Wildlife Service, 2003a. Endangered and Threatened Wildlife and Plants; Notice of Remanded Determination of Status for the Contiguous United States Distinct Population Segment of the Canada Lynx. Federal Register, Volume 68, Number 128, July 3, 2003. Pp 40076-40101
- USDI Fish and Wildlife Service, 2005. Endangered and Threatened Wildlife and Plants; Proposed Designation of Critical Habitat for the Contiguous United States Distinct Population Segment of the Canada Lynx; Proposed Rule. Federal Register, Volume 70, No. 216. November 9, 2005. Pp 68294-68328
- USDI Fish and Wildlife Service. 2005a. Recovery Outline. Contiguous United States Distinct Population Segment of the Canada Lynx. Approved by Sharon R. Rose, Acting Deputy Regional Director, USFWS, Denver, Colorado. 21 p. September 14, 2005.
- USDI Fish and Wildlife Service. 2009. Federally listed and proposed endangered, threatened, and candidate species in Utah by County (<http://www.fws.gov/mountain-prairie/endspp/countylists/utah.pdf>).

- USDI Fish and Wildlife Service. 2009a. Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for the Contiguous United States Distinct Population Segment of the Canada Lynx; Final Rule. Federal Register CFR Part 17, Volume 74, No. 36
- Utah Division of Wildlife Resources. 1980. Furbearer Harvest Reports (State of Utah) 1979-80.
- Utah Division of Wildlife Resources. 1999. Furbearer Harvest Reports (State of Utah) 1998-1999.
- Utah Division of Wildlife Resources. 2000. Utah Data Conservation Center
<http://dwrcdc.nr.utah.gov/ucdc/>
- Utah Division of Wildlife Resources. 2001. Utah Data Conservation Center
<http://dwrcdc.nr.utah.gov/ucdc/>
- Utah Division of Wildlife Resources (UDWR). 2009. Utah Greater Sage-grouse Management Plan. Utah Department of Natural Resources, Division of Wildlife Resources, Publication 09-17, Salt Lake City, Utah. Pp. 94
- Utah Division of Wildlife Resource (UDWR). 2009. Conservation Database
<http://dwrcdc.nr.utah.gov/rsgis2/Search/Display.asp?FINm=dumecaro>
- Wagner, B., S. Harnis, and C. Huffman. 1980. 1980 Rich County riparian small mammal inventory.
- Wasatch-Cache National Forest. 2006. Management Indicator Species of the Wasatch-Cache National Forest. Salt Lake City, Utah Version 2006-1
- Wasatch-Cache National Forest. 2007. Management Indicator Species of the Wasatch-Cache National Forest. Salt Lake City, Utah Version 2007-1
- Wasatch-Cache National Forest. 2008. Management Indicator Species of the Wasatch-Cache National Forest. Salt Lake City, Utah Version 2008-1
- Wolfe, M.L., N.V. Debyle, C. S. Winchell, and T. R. McCabe. 1982. Snowshoe hare cover relationships in northern Utah. Journal of Wildlife Management 46: 662-670.
- Wolff, J. O. 1980. The role of habitat patchiness in the population dynamics of snowshoe hares. Ecological Monographs 50:111-130.