DIAMOND FORK GROUP-SITE CAMPGROUND

FINAL ENVIRONMENTAL ASSESSMENT

December 2004

Spanish Fork Ranger District, Uinta National Forest

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Utah Reclamation Mitigation and Conservation Commission

UTAH RECLAMATION MITIGATION AND CONSERVATION COMMISSION

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CHAPTER 1
PURPOSE AND NEED

INTRODUCTION

This Environmental Assessment (EA) describes the environmental impacts of constructing a group-site campground within the Diamond Fork watershed. This chapter describes the Purpose and Need for the project and the reasons why the Spanish Fork Ranger District (Forest Service) and the Utah Reclamation Mitigation and Conservation Commission (Mitigation Commission) are considering the Proposed action. The Proposed action is intended to achieve the Purpose and Need for the project in accordance with the 2003 *Uinta National Forest Land and Resource Management Plan* (Forest Plan) and the Mitigation Commission's *Mitigation and Conservation Plan*.

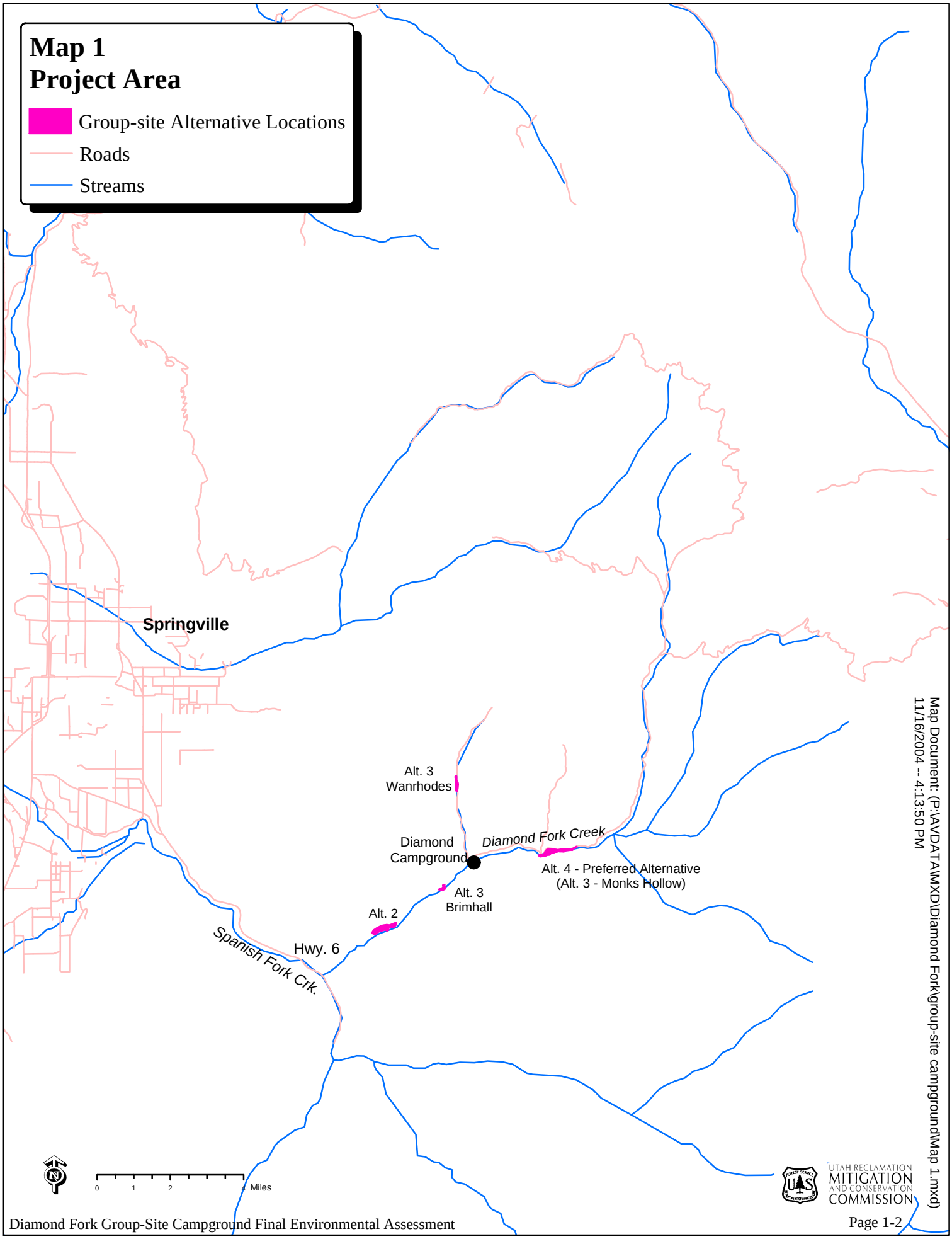
This EA discloses the environmental effects of implementing the Proposed action and other alternatives. The project area is located approximately 12 miles southeast of Spanish Fork, on the Spanish Fork Ranger District of the Uinta National Forest within Utah County, Utah (Map 1).

This EA provides information necessary to determine whether the Proposed action would result in a significant impact to the human environment. If the decision makers conclude that the impacts are not significant, and an Environmental Impact Statement is not required, then the EA will be used as a basis for selecting an alternative to implement. A Decision Notice will be prepared by the responsible officials describing the rationale for the decision.

BACKGROUND

Federal reclamation projects have impacted the Diamond Fork watershed for many years. As early as 1906, construction began on the Strawberry Valley Project that captured water from the Uinta Basin and transported it for irrigation use in the Bonneville Basin via Diamond Fork. In 1956, Congress authorized the construction of the Central Utah Project (CUP). The Diamond Fork System, a component of the CUP, will transport additional water from the Uinta Basin to the Bonneville Basin for use along the Wasatch Front. To mitigate for impacts on recreation associated with the construction and operation of the CUP and also to provide additional outdoor recreation opportunities along the Wasatch Front, the 1988 Definite Plan Report for the CUP committed to the construction of specific recreation facilities in Diamond Fork.

As part of these plans, the Forest Service and Mitigation Commission released an Environmental Assessment dated September 28, 1998, describing the environmental


Map 1
Project Area
Group-site Alternative Locations
Roads
Streams
Springville
Alt. 3
Wanrhodes
Diamond
Campground
Diamond Fork Creek
Alt. 4 - Preferred Alternative
(Alt. 3 - Monks Hollow)
Alt. 3
Brimhall
Alt. 2
Hwy. 6
Spanish Fork Crk.
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effects of a proposal to reconstruct the existing Diamond and Palmyra campgrounds in Diamond Fork. The alternative selected for implementation called for the reconstruction of the campground, yet reduced the campground capacity approximately 33 percent. This reduction in capacity was achieved by removing group-site facilities from the campground and single family campsites from the active floodplain of Diamond Fork Creek.[1] The purpose for the reduction in campground capacity was to minimize impacts on riparian vegetation and to maximize the opportunities for stream restoration afforded by the construction of the Diamond Fork Pipeline.[2] The group-site facilities removed from the Diamond/Palmyra campground had a capacity of approximately 330 Persons At One Time (PAOT). Construction of the campground was completed in October 2000.

The 1998 EA and decision documents of the Forest Service and Mitigation Commission indicated that the group-site facilities removed from the Diamond and Palmyra Campgrounds would be replaced in a more favorable location and that the size and location of the group-site campground would be analyzed in a separate analysis. The purpose of this EA is to analyze the environmental impacts of various group-site campground alternatives.

The 2003 Uinta National Forest Land and Resource Management Plan (Forest Plan)

The Forest Plan establishes a long-range program for management of natural resources. It provides direction, goals and criteria for management to use in responding to public issues and management concerns. Direction set forth in the Forest Plan relevant to this analysis is summarized below.

> Forestwide Goal 6, "Diverse and suitable recreational opportunities are provided responsive to public demand while maintaining ecosystem health and contributing to social and economic sustainability." (2003 Forest Plan, Page 2-1)
>
> Sub-Goal 6-1, "An increasing number of users are accommodated within the capability of the resource by maintaining and improving existing developed recreation sites and emphasizing management of dispersed recreation." (2003 Forest Plan, Page 2-18)
>
> Objective 6-1, "By 2010, reconstruct Timpooneke, Lodgepole, and Little Mill Campgrounds, and the Diamond Fork group sites." (2003 Forest Plan, Page 2-20)

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[1] A group-site campground is a facility that will accommodate large groups ranging in size from 25 Persons At One Time to 150 PAOT.

[2] The Diamond Fork Pipeline is a 510cfs capacity pipeline constructed to remove CUP project water and a portion of Strawberry Valley Project water from the Diamond Fork Stream channel in order to improve aquatic habitats in Diamond Fork Creek.

Additionally, pages 5-55 through 5-56 the Forest Plan describes the desired future condition of recreation in the Diamond Fork Management Area, which includes the reconstruction of the Diamond Fork Campground group sites.

The Mitigation Commission's Mitigation and Conservation Plan

In 1992 Congress transferred the responsibility for the construction of CUP from the Bureau of Reclamation to the Central Utah Water Conservancy District with the enactment of the Central Utah Project Completion Act (CUPCA). CUPCA also established the Mitigation Commission and transferred to it the responsibility to coordinate the implementation of fish, wildlife and recreation mitigation and conservation projects of the Bonneville Unit of CUP among Federal and State fish, wildlife, and recreation agencies. CUPCA directed the Mitigation Commission to develop a Plan that identifies specific projects the Mitigation Commission intends to fund. The Mitigation Commission's *Mitigation and Conservation Plan* places a high priority on completing outstanding commitments of the 1988 Definite Plan Report (Mitigation and Conservation Plan, 1996). The *Mitigation and Conservation Plan* includes the completion of recreation features in Diamond Fork including developed camping opportunities.

Diamond Fork Area Assessment

The Spanish Fork District and the Mitigation Commission completed the Diamond Fork Area Assessment in September 2000. The purpose of this Assessment was to aid in future management decisions by the Mitigation Commission regarding CUP mitigation activities, as well as overall resource management activities by the Forest Service. The Area Assessment, although not a decision document, identified several management opportunities . Addressing the impacts from dispersed recreation on riparian resources was one of these opportunities.

Conceptual Recreation Plan for the Diamond Fork Drainage

The Spanish Fork District and the Mitigation Commission prepared a Conceptual Recreation Plan for the Diamond Fork Drainage in December 2000. This document summarizes the proposed and ongoing projects that would address the recreation management needs in Diamond Fork. One of the proposed projects included a developed group site camping facility that would replace the group sites that were removed from the Diamond and Palmyra campgrounds when they were reconstructed in 2000.

PURPOSE AND NEED

The need to provide additional outdoor recreation opportunities was originally described in the 1984 Final EIS for the Diamond Fork System and was based on the measures summarized below:

- Proximity to the Wasatch Front where 80 percent of the State's population is within 2 hours driving time to Diamond Fork.
- Anticipated increase in recreation demand proportional to population increase.
- Anticipated increase in leisure time.
- Estimated annual increase in outdoor recreation use by 6 percent annually.
- Identified deficit in camping and picknicking opportunities as identified in the State Comprehensive Outdoor Recreation Plan.
- Identified capacity to provide outdoor recreation opportunities in Diamond Fork.

Since 1984, population in Utah and Salt Lake counties has increased 43 percent (Utah Office of Planning and Budget). Overall recreation use has been increasing in Diamond Fork at a rate greater than 15 percent per year with an estimated 600,000 recreation visitor days (RVD)[3] in 1995 (2000 Diamond Fork Area Assessment). The completion of the new road associated with the Diamond Fork Pipeline, proximity to growing urban areas along the Wasatch Front and an anticipated improved fishery are all expected to result in an even faster growth rate in the demand for recreation in Diamond Fork.

With the removal of the group-site facilities from the Diamond and Palmyra campgrounds (approximate capacity 330 PAOT) and the anticipated increase in demand for developed camping in Diamond Fork, there is a need not only to replace the lost capacity of the group-site facilities but also to provide additional camping opportunties to meet existing and anticipated demand. The Forest Service recognizes that not all of this demand can be met over the long-term; however, there is a need to identify the appropriate location, size and type of facility that can be constructed in Diamond Fork within the limits of resource and fiscal constraints.

While meeting this underlying need to provide group-site facilities, the project must also address the following purposes:

1 The group-site campground should not limit opportunities for stream restoration afforded by the completion of the Diamond Fork Pipeline and reduced flows in Diamond Fork Creek.

2 The group-site campground should not significantly impact riparian resources or opportunities for riparian restoration.

3. The group-site campground should complete the recreation development responsibilities of the Diamond Fork System for developed camping in

[3] A recreation visitor day (RVD) is defined as one person spending one 12-hour period of recreation activity on the Forest. RVDs for recreation facilities are estimated by determining days of use for the facility and the average daily use of the facility for that time period.

accordance with the standards and objectives of CUPCA and the Uinta Forest Plan.

4. Where possible, use existing and future developed sites as base areas and jumping off points for dispersed recreation activities to consolidate use (2003 Forest Plan, Recreation Guideline No. 9, Page 3-30).

PROPOSED ACTION

The Spanish Fork Ranger District is proposing to design, construct, and operate a group-site campground in Diamond Fork with a capacity of approximately 475 PAOT (people at one time). The Mitigation Commission is proposing to fund the project as part of meeting the recreation development responsibilities for developed camping identified in the 1984 and 1990 EIS for the Diamond Fork System and the 1988 DPR for CUP. The group-site facility would encompass approximately 25 acres. The campground would include four 75-PAOT sites and one 100-PAOT site, three 25-PAOT sites, five 4-unit vault toilets, paved access road and spurs, shade shelters, a water system, trail system, the establishment of vegetation, a host site and an information/fee station. The proposed project would be constructed no earlier than fall 2004. The preferred alternative is Alternative 4 in this document.

DECISION TO BE MADE

The Spanish Fork District Ranger will decide whether or not to construct a group-site campground in Diamond Fork Canyon, and if so, its size and location. The Mitigation Commission will decide whether or not to fund the construction of a group-site campground in Diamond Fork Canyon, and if so, its size and location.

AVAILABILITY OF THE PROJECT FILE

The Project file for the Proposed Action, which contains all of the planning records including meeting notes, specialist reports, maps, and letters received during the process is located at the Spanish Fork Ranger District Office- 44 West 400 North, Spanish Fork, UT 84660. These records are available for public review.

CHAPTER 2
ALTERNATIVES

INTRODUCTION

This chapter describes the Proposed Action and other alternatives. The Proposed Action and alternatives were developed based on key issues that were identified as a concern by an Interdisciplinary Team of Cooperating Agencies (ID Team) and by the public. The comparison of alternatives provided in this chapter, together with the information provided in Chapter 3, describe the environmental consequences of implementing the alternatives and provides additional information needed by the responsible officials to make an informed choice between alternatives.

ANALYSIS PROCESS

The purpose of this analysis is to compare effects on the environment and the ability of each alternative to address issues and meet the purpose and need for the proposed facilities. Potential sites were identified based on size, access, and physical characteristics (slope, soils, etc.). Eleven sites were initially identified as potential alternatives. A preliminary analysis of the suitability of each site was completed based upon the major issues (impacts on riparian resources, impacts on stream restoration opportunities, impacts on T&E species) and other legal, technical and fiscal considerations such as water rights, access and safety. See Table 1, Summary of Action Alternatives located at the end of Chapter 2.

SCOPING AND PUBLIC INVOLVEMENT

An ID Team representing the Forest Service, Mitigation Commission, Utah Division of Wildlife Resources, and U.S. Fish and Wildlife Service was formulated to identify issues and develop alternatives. In January 2000, a scoping letter was sent to the public describing the proposed action and requesting comments from interested parties. The letter containing maps, a description of the proposed action, and the purpose and need for action was mailed to 201 individuals and organizations. Additionally, an article appeared in the *Provo Daily Herald* on February 6, 2000, and the *Spanish Fork Press* on February 9, 2000. The formal, written scoping comment period closed February 18, 2000. Fifteen (15) individuals and/or organizations responded. Of the public that commented there were several issues raised that were used in the development of alternatives. These comments and concerns are summarized as follows:

- Potential impacts on riparian habitats and restoration efforts in Diamond Fork.
- Potential impacts on stream restoration efforts in Diamond Fork.
- Effects on the Ute ladies' tresses habitat.
- Availability and use of water rights.
- Preference regarding the campground location including the benches above the

Diamond Campground or in the Wanrhodes area was identified.

- Preference to locate the campground in two or three different locations to decrease damage to vegetation, reduce noise levels, and provide more privacy to campground users was identified.

These issues are addressed as part of the development of alternatives as presented later in this Chapter or as part of the analysis of environmental affects addressed in Chapter 3.

Other comments and responses.

Comment Concern was raised that the proposed action will exceed capacity of the Diamond Fork area. It was felt the Uinta National Forest should conduct a carrying capacity analysis to determine the impacts of increasing recreation use will have on the various resources in the area.

Response The 1984 Final EIS for the Diamond Fork System identified a need to construct outdoor recreation facilities as discussed in more detail in Chapter 1 of this document. The 1984 Final EIS determined, through a carrying capacity study, that Diamond Fork had a capacity of 7,100 developed sites. Currently there are 78 individual units at Diamond Campground (38 singles and 20 doubles). Under the Proposed Action an additional 95 equivalent units would be added with the construction of the group-site campground.[4] The total of approximately 173 developed units is significantly below the capacity identified in the 1984 EIS.

Although the 2000 Diamond Fork Area Assessment did not provide a carrying capacity analysis of the canyon it did address the interactions between resources and human uses. The Proposed Action is consistent with the findings in the 2000 Area Assessment. It should also be noted that this action is being taken at the same time dispersed camping is being managed by closing or improving dispersed camp sites. This is addressed in more detail in the cumulative affects section in Chapter 3.

Comment Concern was raised that the capacity of the proposed action, 475 PAOT, is larger than the loss of capacity of group-sites removed from the Diamond/Palmyra campground, 330 PAOT. A preference was expressed to construct a smaller campground that would result in lower operation, maintenance and law enforcement costs. The savings could be used to increase law enforcement efforts that would help mitigate damage done to the watershed and to other resources.

Response The purpose and need identified in the 1998 Diamond/Palmyra Environmental Assessment and prior NEPA documents was to provide additional developed camping opportunities. The Forest Service and the Mitigation Commission made a determination to reconstruct the Diamond and Palmyra campground, yet reduce the capacity by approximately 33 percent from 580 PAOT to 390 PAOT, a reduction of 190 PAOT. This was done by removing the group-site

[4] Each individual camp-site has a capacity of approximately 5 Persons At One Time. The capacity of the 475 PAOT group-site facility is approximately equal to 475 PAOT/5PAOT = 95 equivalent units.

facilities with a capacity of 330 PAOT and increasing the number of individual family campsites by 140 PAOT. The decision was based on the commitment to construct a new group-site campground in a more favorable location.

Replacing the 330 PAOT would only replace the pre-existing group-site capacity lost in the reconstruction of Diamond Campground. The underlying need to provide additional developed camping would not be met. Therefore, alternatives that provided a capacity of 330 PAOT or less were not considered because they did not meet the purpose and need for the project. The increased capacity of 145 PAOT is a target amount of additional capacity that would meet the underlying need of the project (see page 1-5).

The complete record of public comment is available for review in the project file at the Spanish Fork Ranger District office.

A Draft Environmental Assessment for group-site facilities was released in May 2003. Five comment letters were received in response to the May 2003 document. Responses to these comment letters are provided in Chapter 4.

The Forest Service also issued the Final Land and Resource Management Plan for the Uinta National Forest in May 2003. Since the May 2003 Draft EA for the group-site campground was in production at the same time the 2003 Forest Plan was being finalized, it did not incorporate all planning direction provided in the 2003 Forest Plan. Therefore, it was determined the May 2003 Draft EA should be revised to incorporate the management direction provided in the 2003 Forest Plan and be re-issued for public review. On August 7, 2004, a (revised) Draft EA was released for pubic review and comment. Responses to letters commenting on the August 2004 EA are also included in Chapter 4.

SIGNIFICANT ISSUES

The significant issues identified through scoping are summarized below. These issues will be used as a basis for comparing alternatives.

Issue 1. Stream Restoration

There is a concern that the construction of a group-site facility could conflict with the restoration of Diamond Fork Creek if facilities are constructed within the active floodplain. Current restoration objectives for Diamond Fork Creek include the following:

- Stream flows that mimic a natural hydrograph forming a stable but dynamic stream and riparian ecosystem.
- Establish a naturally self-sustaining Brown trout (*Salmo trutta*) and Bonneville cutthroat trout (*Salmo clarki*) population.

- Maintain populations of native fish including (Leatherside chub (*Gila copei*), Longnose dace (*Rhinichthys cataractae*), Mottled sculpin (*Cottus bairdi*), Mountain sucker (*Catostomus platyrhynchus*), Redside shiner (*Richardsonius balteatus*) in the Diamond Fork drainage.

The 2003 Forest Plan provides the following direction and guidance:

- " Watersheds and their associated stream processes, channel stability, riprian resources, and aquatic habitats are maintained or restored to a functional condition" (2003 Forest Plan, see Sub-goal-1-9, Page 2-2).
- "Avoid equipment operation in stream courses, open water, seeps, or springs. If use of equipment in such areas is required, impact should be minimized" (2003 Forest Plan, Aqua-5, Guideline, Page 3-2).
- "Within sub-watersheds containing a Bonneville or Colorado River cutthroat trout recovery stream, avoid management activities that would significantly reduce aquatic and riparian habitat or significantly retard its rate of recovery" (2003 Forest Plan, Aqua-3, Guideline, Page 3-2).

Issue 2. Impacts on Riparian Habitat

There is a concern that construction of the group-site facility and associated visitor use could have detrimental effects on riparian habitat and associated wildlife species primarily neotropical migratory birds.

The 2003 Forest Plan provides the following direction and guidance:

- Sufficient vegetation is left on channel banks to catch sediments necessary for streambank maintenance and floodplain development (2003 Forest Plan, Sub-goal-1-5, Page 2-2)
- Watersheds and their associated stream processes, channel stability, riparian resources, and aquatic habitats are maintained or restored to a functional condition (2003 Forest Plan..see Sub-goal-1-9, Page 2-2).
- Wildlife travel corridors, riparian corridors, and key linkage routes are maintained and, where feasible, restored… (2003 Forest Plan, Sub-goal-2-26, Page 2-10).
- Riparian habitat in Central Utah Project-impacted reaches of lower Diamond Fork are maintained or restored to a functional condition (2003 Forest Plan. Sub-goal-1-9, Page 2-2).
- Riparian habitat in Central Utah Project impacted reaches of Strawberry Valley streams, Sixth Water Creek, and lower Diamond Fork River is restored to desired conditions through mitigation activities conducted in cooperation and coordination with the Central Utah Water Conservancy District, the Department of the Interior, other federal and state agencies, and the public (2003 Forest Plan, Sub-goal-2-37, Page 2-11).

- Healthy, self-sustaining riparian communities, habitat for viable populations of aquatic life, and conditions for natural stream dynamics exist on the Forest (2003 Forest Plan, Sub-goal-2-38, Page 2-11).
- New recreation facilities should be located outside the RHCAs (riparian habitat conservation area). If the only suitable location for such facilities is within an RHCA, an exception may be made if adverse effects to native aquatic organisms are avoided or adequately mitigated (2003 Forest Plan, Rec-2, Guideline, Page 3-29). Diamond Fork Creek is in a Value Class I RHCA with a 300' buffer from either side (edge) of the stream
- Maintain adequate ground cover to filter runoff and prevent detrimental erosion in RHCAs. Ground cover requirements for Class I RHCAs is 90 percent of potential in 90 percent of the RHCA (2003 Forest Plan, S&W-4 Guideline, Page 3-9).

Issue 3. Ute ladies'-tresses orchid

The Ute ladies'-tresses orchid (ULT), a threatened species protected under the Endangered Species Act, is found in Diamond Fork. There is a need to protect ULT habitat and plants from both direct (e.g. construction activities) and indirect (e.g.. trampling by campers) impacts associated with the alternatives. Surveys conducted in 1992 through 2003 show up to 77 colonies in Diamond Fork, some of which could be impacted by the construction of a group-site campground. Colonies range in population from one individual to over 14,000, and the habitat islands range in size from a few square feet to several thousand square feet.

The 2003 Forest Plan provides the following direction and guidance:

- "Ecosystems on the Forest provide and maintain viable and well-distributed populations of flora and fauna. New listings of threatened, endangered, and sensitive species as a result of Forest Service management activities are avoided…" (2003 Forest Plan, Sub-goal-2-6, Page 2-5).
- The collection of commercial and personal use fuelwood (including fuelwood for both recreational on-Forest use and permitted use) is prohibited in the lower 7.5 miles of the Diamond Fork River corridor (2003 Forest Plan, Timber-13, Standard, Page 3-22).
- Offer firewood for sale to discourage the collection of fuelwood within developed recreation sites in the lower 7.5 miles of the Diamond Fork River corridor (2003 Forest Plan, Rec-11, Guideline, Page 3-30).
- Where feasible, provide pollinator habitat adjacent to Ute ladies'-tresses colonies by avoiding the removal of down woody material in the course of any management activities in the lower 7.5 miles of the Diamond Fork River corridor. Where removal cannot be avoided, salvage a portion of down woody material greater than 3 inches in diameter and relocate it to

sunny openings adjacent to Ute ladies'-tresses colonies" (2003 Forest Plan, WL&F-16, Guideline, Page 3-13)..

OTHER CRITERIA FOR SITE EVALUATION

Other criteria considered in the evaluation of a site include the following:

- Potential impacts to other resources, including wildlife, visual resources and heritage resources.
- Soil stability of a site and the potential for increased erosion as a result of construction of a facility.
- Adequate size of a location. Approximately 25 acres of gently sloping or level ground is desired to efficiently spread out the proposed number of group-sites.
- The ability to establish vegetation where adequate vegetation does not exist.
- Availability of a potable water source that could be used at the campground.
- Proximity of potential sites to existing access routes. The cost of developing new access roads is extremely high. All action alternatives are within close proximity to the existing Diamond Fork Road with the exception of the Wanrhodes site. The Wanrhodes site would require widening and paving of an existing gravel road to allow suitable access for users.
- User safety and potential hazards, such as the proximity to Diamond Fork Road and whether users would need to cross Diamond Fork Road to get to Diamond Fork Creek. Other hazards were considered such as cliffs, falling rocks, and flooding. All of the proposed sites would be on the east side of Diamond Fork Road, the same side as the river except for the Wanrhodes location. The Wanrhodes site would be on the west side of the access road, the same side as Wanrhodes Creek.

ALTERNATIVES CONSIDERED BUT ELIMINATED

A preliminary review of potential sites was conducted based on the significant issues and the other evaluation criteria listed above. As a result of this preliminary review, four alternatives (including the no action alternative) are carried forward for detailed analysis. The remaining alternatives are not being analyzed in detail because they were not considered viable alternatives. The alternatives considered but not carried forward for detailed analysis are summarized below.

Construction of 330 PAOT Campground It was determined that this alternative does not meet the purpose and need of the project (refer to comments earlier in this Chapter).

Little Diamond Little Diamond is located in Diamond Fork just one mile from the old Diamond and Palmyra campgrounds. This site was eliminated from detailed

consideration primarily because of the impacts on riparian resources and safety considerations. The primary purpose for removing the group-site facilities from the new Diamond Fork campground was to minimize impacts on riparian resources and to facilitate stream restoration. Constructing the group-site facilities in such close proximity to Diamond Fork campground would offset some of the benefits of removing those facilities from that site. In addition, there is a safety consideration with the site located on the west side of Diamond Fork road. It is believed that many of the group-site users would be attracted to Diamond Fork Creek which is on the east side of the road. To get to the river from the group-site campground, users would need to cross Diamond Fork road.

Diamond Campground A determination has already been made (Decision Notice for the Diamond/Palmyra Campground EA, 9/28/2004) to remove the group-site facilities from the Diamond Campground site and this location was eliminated from detailed consideration.

Benches above Diamond Campground This site was considered during the reconstruction of the Diamond/Palmyra Campground. It was eliminated from detailed analysis because of the steep access required to reach the benches and the slumping nature of soils in the area. This site was not considered in this analysis for the same reasons.

Off Forest Location Consideration was given to locating a group-site campground off the Uinta National Forest and out of Diamond Fork, such as Spanish Fork Canyon as proposed by Utah County. This alternative was not considered in detail because it would not meet the underlying purpose and need of providing group-site camping opportunities on National Forest System lands in Diamond Fork.

Upper Fifth Water Similarly, the Upper Fifth Water location would not meet the underlying purpose and need of providing group-site camping opportunities near Diamond Fork Creek. The site would be accessed from Sheep Creek.

Timber Mountain The Timber Mountain site did not meet the underlying purpose and need of providing group-site camping opportunities near Diamond Fork Creek

Sawmill Hollow. Sawmill Hollow had a number of issues that eliminated the site from detailed consideration. This site is only large enough to accommodate construction of a small (< 50 PAOT) group site without intrusion into a floodplain and incurring an unacceptable level of impact on riparian resources, soil stability, and safe access. In addition, this area has long been used and is highly valued by many individuals, families and small groups as a desired dispersed camping site. On May 28, 2002, Ranger William Ott approved a Decision Memo authorizing management of the Sawmill Hollow site as a trailhead and dispersed camping site(s).

Lower Diamond Fork Mitigation Property. The Lower Diamond Fork Mitigation Property is located just downstream of National Forest System lands in this drainage.

The property was acquired as mitigation for impacts on fish and wildlife resources resulting from the construction and operation of the Diamond Fork System. Construction of a group-site campground on the property would compromise the purposes for which the property was acquired. For this reason, the property was eliminated from detailed consideration.

ALTERNATIVES CONSIDERED IN DETAIL

ALTERNATIVE DESCRIPTIONS

Alternative 1: No Action

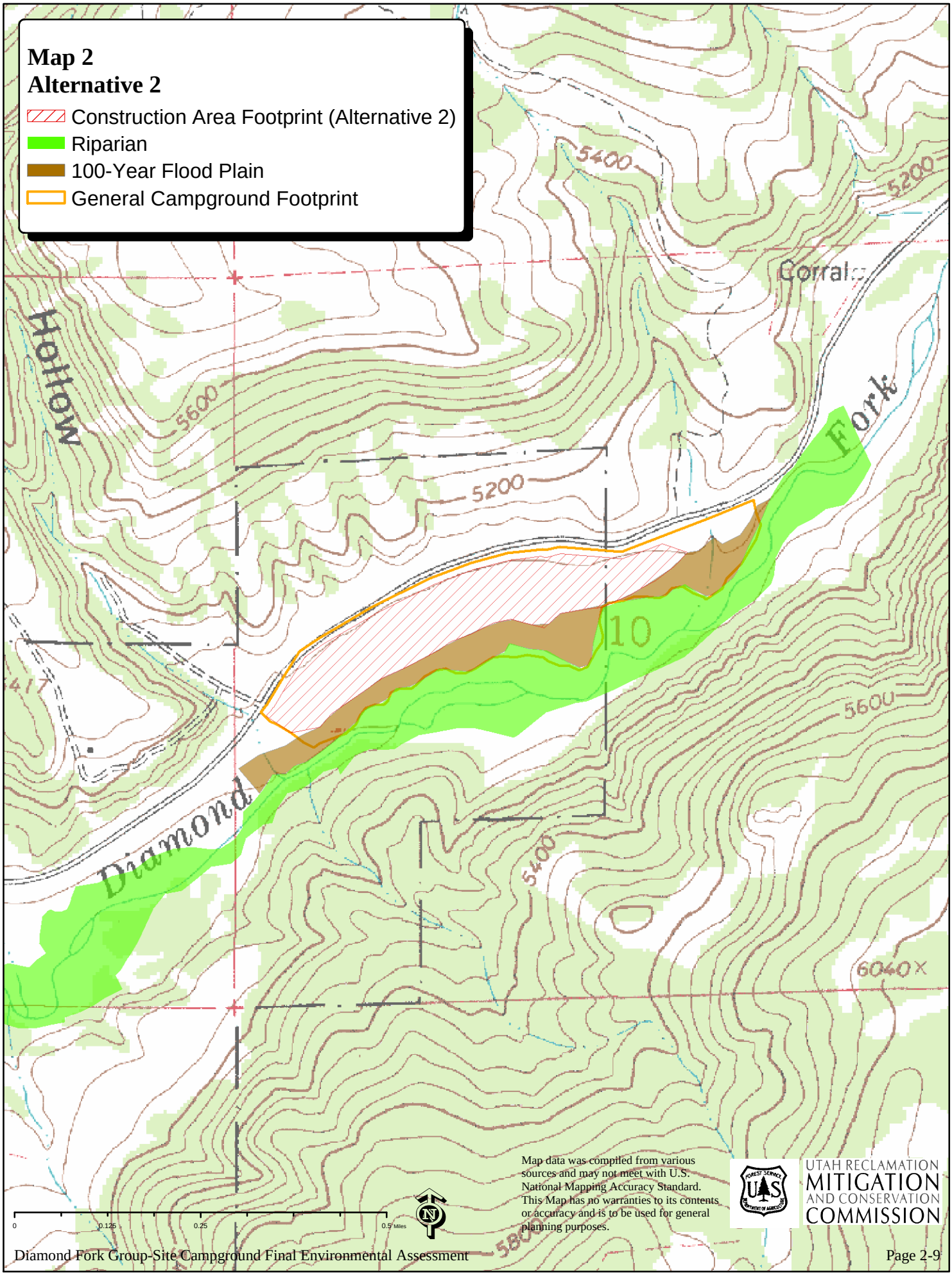
Under the no action alternative, a group-site facility would not be constructed and the underlying need for the project would not be met.

Alternative 2

This alternative location is the lower Diamond Fork Canyon approximately 2 miles from Highway 6. The site is an historic floodplain area which was converted to agricultural use early in the century. The site is linear, located between the road and Diamond Fork Creek, and slopes gently from the road to the creek in a series of historic flood terraces. A historic irrigation system exists on the property and reports and records suggest the site was used primarily for alfalfa (*Medicago sativa*) hay production. A single clump of box elder (*Acer negundo*) trees remains on the knoll in the mouth of Lavanger Hollow, and some Basin big sagebrush (*Artemisia tridentate)* is found along the fenceline adjacent to the road and in a few other scattered spots (see Alternative 2 Map).

The group-site facility would encompass approximately 25 acres, about 6 acres of which would be impacted by construction of three 50-PAOT sites, three 75-PAOT sites, and one 100-PAOT site. There would be approximately five, 2-unit vault toilets, paved access roads and spurs, shade shelters, a well for a water system, an information/fee station, interpretive trail and open play area. The site would be revegetated with trees and shrubs and would contain an irrigation system. Construction could take place no earlier than the fall of 2004.

The construction area would be in an upland site and out of the 100-year floodplain. Impacts on riparian vegetation would be less than 0.1 acre. The proposed site has a high potential for regeneration of a riparian forest through cultivation and irrigation that would be precluded in part by the construction of a group-site campground. This site is also adjacent to heavily populated Ute ladies' tresses habitats, a threatened species, and could be impacted by having more people in the area. Similarly, the Columbia spotted frog, a species of concern, has been identified near the site and these populations could be indirectly impacted from visitor use. The location is also in close proximity to lands that have been acquired as partial mitigation for impacts on wildlife resulting from the


Map 2
Alternative 2
Construction Area Footprint (Alternative 2)
Riparian
100-Year Flood Plain
General Campground Footprint
Hollow
Diamond
Fork
Corrals
5400
5200
5600
10
6040
0
0.125
0.25
0.5 Miles
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construction of the Central Utah Project. Increased human use in the area could have an indirect impact on wildlife utilization of the mitigation lands.

Mitigation measures unique to this site include the installation of temporary construction fencing and assignment of an inspector to assure that Ute ladies' habitat is not impacted by construction. The Forest Service in consultation with U.S. Fish and Wildlife Service (FWS) will establish baseline levels of impacts in adjacent Ute ladies'-tresses colonies as part of the vegetation management plan. If unacceptable user impacts develop, the Forest Service shall work with FWS to develop additional protection measures. The vegetation management plan will emphasize reestablishment of a cottonwood vegetative community to the extent practical, including supplemental watering until establishment.

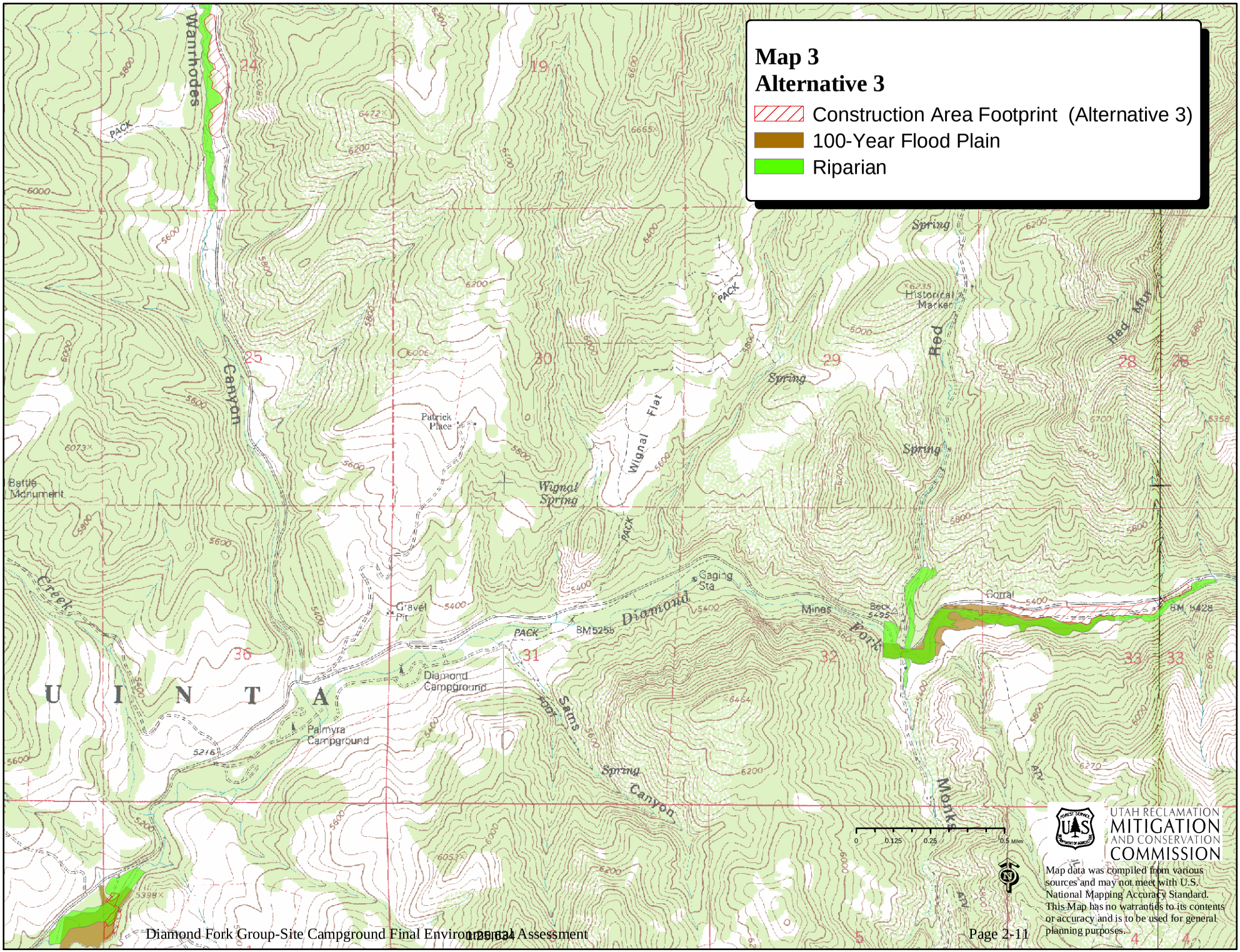
Alternative 3

This alternative location is at three separate sites. The environmental affects of construction at all three sites will be analyzed. However, construction of the facility at two of the three sites would be considered as an option if the underlying need for the project would be met with fewer environmental impacts. The three areas are Brimhall, Wanrhodes, and Monks Hollow (See Alternative 3 map). Monks Hollow would be the main site with additional construction at Brimhall or Wanrhodes to meet the desired capacity.

The Brimhall site is located at the confluence of Brimhall Canyon and Diamond Fork Creek. The site encompasses approximately 3 acres, about 1.5 acres of which would be directly impacted by construction actvities. The area proposed for development at the mouth of Brimhall Canyon lie in and adjacent to riparian plant communities along both sides of Diamond Fork Creek. The lower edges of the sites are occupied by cottonwood, willow and birch. The site on the south side of the creek is fairly level and sits several feet above the current stream level on an old floodplain surface. It is occupied primarily by seeded upland grasses, grading into sagebrush-grass. There are some pockets of willow on this site, and a large birch tree, presumably supported by subsurface water.

The site on the north side includes a floodplain surface that is only sparsely vegetated due to past impacts from parking and dispersed camping. The area has been closed to parking and camping for 2-3 years but the vegetation has not fully recovered, likely due to compacted soils and a loss of seed source. The area is disected by a small intermittent drainage entering from the north, and the access road extending from the main road. The flat floodplain grades quickly into steeper sagebrush-grass slopes. Cottonwoods and willows grow along the creek.

This site would accommodate one 50-PAOT unit. Parking would be located on the north side of Diamond Fork Creek with facilities on the south side. The parking area and campground would be connected by an existing bridge. Vehicle access across the bridge would be allowed for administrative-access only. There would be one, 2-unit vault toilet, shade shelters, an information/fee station, and interpretive trail. A water


Map 3
Alternative 3
Construction Area Footprint (Alternative 3)
100-Year Flood Plain
Riparian
Wamhodes
Canyon
Creek
Battle Monument
Patrick Place
Wignal Spring
Wignal Flat
Gravel Pit
Diamond Campground
Palmyra Campground
U I N T A
Diamond
Fork
Sams
Spring
Canyon
Gaging Sta
Mines
Beck
Corral
Historical Marker
Red
Mtn
Monks
Spring
PACK
BM5255
BM 5428
0 0.125 0.25 0.5 Miles
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source would not be developed at this site. Water would be available at Diamond Campground.

The site is located partially in the 100-year floodplain and riparian corridor. Clearing of approximately 1.5 acres of riparian vegetation would be required. Diamond Fork Creek would need to be hardened near the campground in order to protect facilities from overbank flows and lateral migration of the river channel. This may limit future stream restoration efforts in this area. Winter roosting habitat for bald eagles would be directly impacted by construction and would be indirectly impacted with increased human use.

The Wanrhodes site would be located about three miles up Wanrhodes road from Diamond Fork. The site is located in a small flat adjacent to the road, which drops steeply to the creek on the west side. The flat is occupied by mountain big sagebrush, but has been seeded in the past to smooth brome and has also been heavily impacted by dispersed camping resulting in bare ground and compaction. This is predominantly an upland site, with cottonwoods limited to the streambanks below the site. The site encompasses about 10 acres, approximately 2 acres of which would be directly impacted by construction of up to two 75-PAOT units. The campground would be located between Wanrhodes road and Wanrhodes Creek. A water source would not be developed at this site. There would be approximately 2, 2-unit vault toilets, a paved access road, shade shelters, an information/fee station, and open play area. Water would be available at Diamond Campground. The construction area would be in an upland site and out of the 100-year floodplain. Impacts on riparian vegetation would be less than 0.1 acre.

The Monks Hollow site would be located just north of the Monks Hollow trailhead in Diamond Fork. This site would encompass about 14 acres, approximately 3 acres of which would be directly impacted by construction. This site was the staging and spoil area for the Tanner Ridge Tunnel and Red Hollow Pipeline, a feature of the Diamond Fork System. The Diamond Fork Creek Outlet, also a feature of the Diamond Fork System, would be located in the group-site campground adjacent to Diamond Fork Creek. The outlet would release water from the Red Hollow pipeline to Diamond Fork Creek to meet minimum streamflow requirements in Diamond Fork. The minimum streamflow at Monks Hollow is 80 cfs May through September and 60 cfs October through April. The outlet would also be capable of releasing up to 660 cfs if the lower Diamond Pipeline were to require an emergency shutdown. The outlet area has been fenced and signed to restrict public access.

Much of the staging area is devoid of any vegetation, with some sagebrush, grasses, junipers and forbs. This area has been substantially disturbed by construction. The site has recently been recontoured and covered with topsoil. The riparian area around this site has been protected and is composed of cottonwood and willows. There is a cultural resource site and spring on the south side of Diamond Fork Creek within walking distance of the proposed group site.

The site could accommodate one 100-, two 75- and one- 25-PAOT units on the north side of Diamond Fork Creek. Each site would have all the amenities as described under

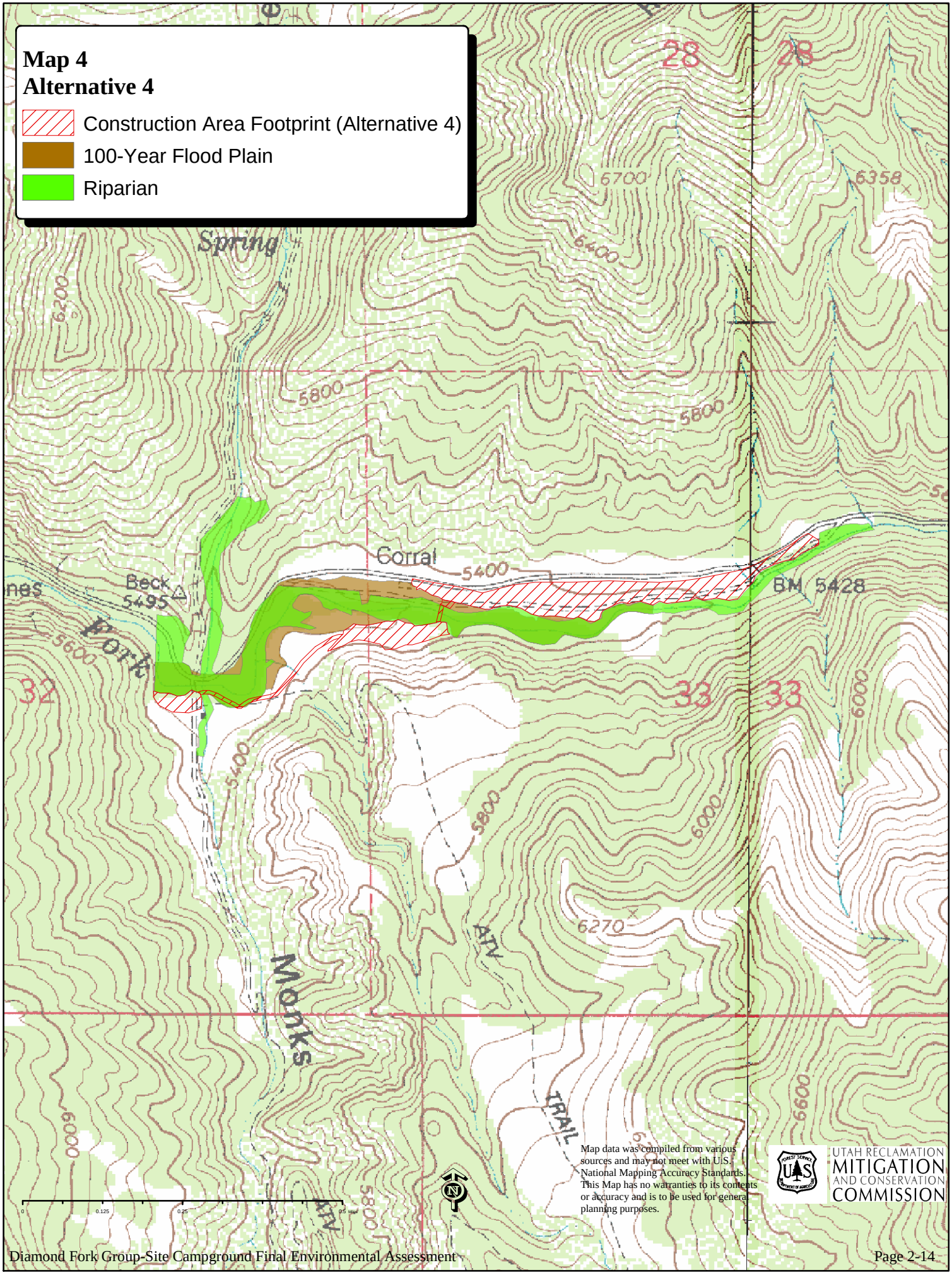
Alternative 2. The construction area would be in an upland site and out of the 100-year floodplain. Impacts on riparian vegetation would be less than 0.1 acre.

Water at the Monks Hollow site would be developed at a spring located in Red Hollow and piped to the site. Water system facilities include a developed spring including collection lines and spring box, 10,000 gallon buried water storage tank, approximately 1.0 mile of buried pipeline, and 0.75 mile of distribution line within the Monks Hollow facility. The water collection and distribution system will also include the installation of a hypochlorinator. The hypochlorinator supplies a measured dose of hypochlorite solution (diluted chlorine bleach) into the water system to treat water supplied to the campground. Bacteriological sampling would periodically be conducted at the campground to verify water quality, and therefore, the water system would not be routinely chlorinated.

Mitigation measures unique to this site include interpretation, protection and monitoring of the cultural resources site, spring source and associated riparian area. Locating the campground host within visual site of the cultural resource site and/or establishing deterrent vegetation with appropriate signing. Portions of the perimeter of the campground would be fenced.

Alternative 4

Alternative 4 is the **Proposed Action.** Under this alternative all 475 PAOT would be constructed at Monks Hollow. This site would encompass about 20 acres, approximately 6.5 acres of which would be directly be impacted by construction. This alternative would include the 275-PAOT described under Alternative 3. The 25-PAOT unit located on the north side of Diamond Fork Creek under Alternative 3 would be relocated adjacent to the existing Monks Hollow Trailhead. Two more 25-PAOT units would be constructed at the existing Monks Hollow Trailhead for a total capacity of 75 PAOT at the trailhead. An additional 75-PAOT unit would be constructed on the north side of Diamond Fork Creek. On the south side of Diamond Fork Creek, one 75-PAOT unit would be constructed upstream of the existing Monks Hollow trailhead. This 75-PAOT unit facility would be accessed by a new foot-bridge spanning Diamond Fork Creek. It would be within 100 feet of a cultural resource site. An administrative-access road would be constructed on the south side of Diamond Fork Creek from the Monks Hollow trailhead, across Monks Hollow Creek to the 75-PAOT site. The reach of Diamond Fork Creek where the foot-bridge is proposed is entrenched and lateral migration is not likely. The access road would be used temporarily for construction of the site, and permanently for the maintenance of facilities. Parking would be provided on the north side of Diamond Fork Creek for campground users. Water at the Monks Hollow site would be developed as described for Alternative 3. Five 2-unit vault toilets would be provided (See Alternative 4 - Monks Hollow Map).


Map 4
Alternative 4
Construction Area Footprint (Alternative 4)
100-Year Flood Plain
Riparian
Spring
Corral
Beck
5495
BM 5428
Fork
Monks
ATV
TRAIL
28
28
32
33
33
6700
6358
6400
6200
5800
5800
5400
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This alternative would have all the amenities as described under Alternative 2 with the addition of an interpretive loop trail to connect all group sites.

With the exception of the administrative access road and footbridge, all features would be constructed out of the 100-year floodplain and riparian area. The administrative access road constructed in the 100-year flooplain and riparian area would have an impact of approximately 0.44 acres but would not need to be protected from overbank flows and the river channel would not be armored to protect this feature. Townsend's big-eared bats could be indirectly impacted by increased human activity in the area. Mitigation measures unique to this site are the same as those described for the Monks Hollow area under Alternative 3. In addition, post and rail fencing would be constructed at selected sites around the campground perimeter to restrict ATV users to motorized trails. The Monks Hollow trail is a designated ATV trail. The abutments for the foot-bridge would be placed as far back from the active channel as possible, limiting the impacts of the bridge. A permanent culvert would be constructed across Monks Hollow Creek replacing the existing low water crossing.

MITIGATION MEASURES COMMON TO ALL ALTERNATIVES

Measures would be taken during design and again during construction to avoid and preserve sensitive areas that may be present such as Ute Ladies' tresses habitat, cultural resources, wetlands or riparian vegetation. Implementation of construction standards and guidelines and Best Management Practices (BMP's) will limit sediment transport to Diamond Fork Creek and protect water quality. BMP's are listed in Appendix 1. A vegetative management plan would be developed to guide long-term management of sensitive areas within the campground and area of influence. Indirect impacts from public use would be mitigated by proper signing, fencing, development of designated natural surface trails and through education and interpretation. These measures will direct the public away from sensitive areas. Firewood would be made available for sale from the campground concessionaire. Construction will not take place between early April and mid-July to protect neo-tropical migratory birds during the nesting and fledging periods. Removal of riparian forest will be minimized. Weeds would be treated prior to any ground disturbing activities and monitored and treated after construction. Any imported materials such as soil, mulch or seed would be weed free. Equipment used in construction will be thoroughly cleaned before entering the Forest, to avoid spread of weeds. The vegetation management plan when dealing with areas of cottonwood overstory, will emphasize protection and encouragement of cottonwood recruitment, using provisions appropriate to both construction and campground operation. Campground facilities would be neutral in color and blend in with the natural surrounding. Fencing and cattleguards would be installed to restrict cattle from campgrounds and parking areas.

Table 1
Summary of Action Alternatives

	Alternative 2	Alternative 3 (two or more of the three sites)	Alternative 4 (Preferred Alternative)
Capacity	475 PAOT (1-100 unit; 3-75 units; 3-50 units)	*Brimhall* ..... 1-50 PAOT *Wanrhodes* ..... 2-75 PAOT *Monks Hollow* .... 1-100, 2-75, 1- 25 PAOT ..... 475 PAOT Total	475 PAOT (1-100 unit; 4-75 units; 3-25 units)
Safety/Access	One access on east side of Diamond Fork Road.	One access road at Brimhall and Wanrhodes. Two access roads at Monks Hollow.	Three access roads on the east side of Diamond Fork Road. Permanent administrative access road on south side of Diamond Fork Creek.
Restrooms	Five 2-unit vault toilets.	Five 2-unit vault toilets (one at Brimhall, two at Wanrhodes and Monks Hollow).	Five 2-unit vault toilets.
Water Source	Drilling a well and constructing a distribution lines to each site.	No water provided at Brimhall or Wanrhodes. Develop spring source, storage at Monks Hollow and constructing a distribution lines to each site.	Develop spring source, storage at Monks Hollow and constructing a distribution lines to each site.
Other	Interpretive trail, shade pavilions, tables, fire pits, cooking platforms, information/fee station, open play area.	Same as Alternative 2	Same as Alternative 3 plus foot bridge across Diamond Fork Creek upstream of existing Monks Hollow Bridge. Post and rail fencing.
Construction Area Footprint (acres) and Affected Habitat Type	Construction Area Footprint .....25 acres Area occupied by facilities.....6 *By Habitat Type* Upland Area .....24.9 Riparian only..... <0.1 100-year floodplain only.....0 Riparian and 100-year floodplain.....0	***Brimhall*** Construction Area Footprint.....3.07acres Area occupied by facilities .....1.5 *By Habitat Type* Upland Area .....0.72 Riparian only ..... 0.44 100-year floodplain only ..... 0.82 Riparian and 100-year floodplain ..... 1.09 ***Wanrhodes*** Construction Area Footprint.....9.6 acres Area occupied by facilities .....1.7 *By Habitat Type* Upland Area .....9.5 Riparian only .....<0.1	Construction Area Footprint .....19.34 acres Area occupied by facilities.....6.5 *By Habitat Type* Upland Area.....18.17 Riparian only.....0 100-year floodplain only.....0.73 Riparian and 100-year floodplain only.....0.44

Table 1 Summary of Action Alternatives			
	Alternative 2	**Alternative 3** **(two or more of the three sites)**	**Alternative 4** **(Preferred Alternative)**
		100-year floodplain only .....0 Riparian and 100-year floodplain .....0 ***Monks Hollow*** Construction Area Footprint.....13.65 acres Area occupied by facilities .....2.8 *By Habitat Type* Upland Area ..... 13.55 Riparian only .....<0.1 100-year floodplain only .....0 Riparian and 100-year floodplain 0	

CHAPTER 3
AFFECTED ENVIROMENT
AND ENVIRONMENTAL EFFECTS ANALYSIS

INTRODUCTION

This chapter describes the physical and biological components of the environment that would be affected by the proposed action and other alternatives. It also discloses the environmental effects of implementing each alternative and the degree to which each alternative addresses the issues identified during scoping. Three significant issues associated with the development of a group-site campground were identified. These issues are described in Chapter 2 and include **1) stream restoration, 2) impacts to riparian and wetland areas**, and **3) impacts to Utes ladies'-tresses**. Each alternative was analyzed according to whether or not it meets the purpose and need of the project, how well the alternative addresses the issues, and how the alternative addresses other criteria such as size, access, water, soils, and safety.

As noted in Chapter 2, the analysis of environmental consequences is driven by a set of evaluation criteria developed for each issue. For ease of reference, the issue and criteria are summarized in this Chapter.

ISSUE 1. STREAM RESTORATION

The Diamond Fork Pipeline has been constructed to remove high irrigation flows from Diamond Fork Creek and lower Sixth Water Creek. The Diamond Fork Pipeline was recently put into operation in June 2004, and flows in Diamond Fork Creek will now return to a more natural hydrograph and provide the opportunity to restore Diamond Fork Creek to a more natural functioning riverine ecosystem. The river will have the opportunity to meander throughout its active floodplain in a more natural pattern. Periodic overbank flooding will help restore riparian areas. There is a concern that if the campground were constructed in the active floodplain, banks would need to be hardened to protect the campground from lateral migration of the river channel. River migration and overbank flooding are necessary to establish and maintain healthy aquatic and riparian ecosystems. Hardening of the banks would restrict opportunities for stream restoration and diminish the benefits afforded by the Diamond Fork Pipeline.

Measurement indicator used to compare the alternatives: A qualitative description of the area affected by each alternatives and how restoration of Diamond Fork Creek may be affected by implementation of the alternative.

Affected Environment

Diamond Fork Creek is a tributary of the Spanish Fork River and has a drainage area of 156 square miles. Elevations in the watershed range from roughly 5,000 feet at the mouth of Diamond Fork Creek to over 10,000 feet on Spanish Fork Peak. Average

precipitation is about 21 inches per year. Average annual precipitation varies from 26 inches on the higher elevations of Strawberry Ridge which forms the east boundary of the watershed to 14 inches near the confluence with the Spanish Fork River.

Environmental Effects

Alternative 1

Under the No Action Alternative, no new campground facilities would be constructed and there would be no resulting direct or indirect impacts on opportunities for future stream restoration efforts. There are presently numerous existing physical features such as Diamond Fork Road, Diamond Fork Pipeline, Diamond Fork Outlet and several bridges and culverts that will constrain the movement of the Diamond Fork channel.

Alternative 2

The site is outside the active floodplain and would not require hardening of Diamond Fork Creek. There would be no direct impacts on future stream restoration opportunities. As discussed in greater detail under Issue 2, the site has a potential for riparian restoration through planting and irrigation.

Alternative 3

Brimhall

The proposed Brimhall site is on the east side of Diamond Fork Creek at the mouth of Brimhall Canyon. The site would be accessed by an existing bridge directly upstream of the proposed site. Due to space limitations at this site, portions of the campground would need to be constructed within the active floodplain. Diamond Fork Creek would be rip-rapped from the existing bridge downstream through the campground to protect campground facilities and infrastructure. Stream restoration would be limited by restricting lateral migration of the river channel.

Wanrhodes

The Wanrhodes site is outside the Diamond Fork corridor and would not affect restoration opportunities on Diamond Fork Creek directly or indirectly.

Monks Hollow

The general location contains one of the few reaches of Diamond Fork Creek between Little Diamond Fork Creek and Three Forks where the stream has an intact floodplain that is accessible to the river. The upper part of the site is well above the floodplain and removed from the immediate riparian corridor. Construction would be outside the active floodplain and would not restrict restoration opportunities of Diamond Fork Creek.

Alternative 4

The location of the Monks Hollow site is the same as described in Alternative 3 with the addition of two additional sites on the south side of the river. One site would consist of a walk-in 75 PAOT campsite situated on a terraced surface 3 to 5 feet higher in elevation than the adjacent floodplain. Access to the walk-in

campsite would be via a footbridge from a parking area that would remain on the north side of the river. The second site would consist of three 25 PAOT campsites located at the already improved Monks Hollow trailhead. Access to the three 25 PAOT sites on the south side of the river would be over an existing bridge.

The 75 PAOT walk-in site and the three 25 PAOT sites would be constructed outside of the active floodplain with the following exceptions. Abutments for the foot-bridge would need to be placed within the active floodplain. These abutments could impact channel geometry by limiting the ability of the river to laterally migrate. The particular section of Diamond Fork where the foot-bridge is proposed is entrenched and lateral migration is not likely. The abutments for the foot-bridge would be placed as far back from the active channel as practical, limiting the impacts of the bridge. Administrative vehicular access to the walk-in site would be via the existing bridge at Monks Hollow, across Monks Hollow Creek, and then follow an existing unclassified native surface road for approximately 0.2 miles. An additional 0.2 miles of native surface road would then be constructed to access the site. A total of 0.4 miles of classified road would be added to the Forest's transportation system. The portions of the administrative access road constructed in the 100-year floodplain and riparian area would not need to be protected from overbank flows and the river channel would not be armored.

ISSUE 2. EFFECTS ON RIPARIAN HABITAT AND WETLANDS

Riparian Habitat: Streams and their associated riparian zones are critically important to arid ecosystems. Because of their high soil moisture and fertility, riparian zones are very productive and support a large proportion of the vegetative species occurring in grassland and desert ecosystems. In some western states, up to 80 percent of all wildlife species are associated with streams and their riparian zones at some point in their life cycle. A 1996 bird survey in Diamond Fork illustrates that many riparian forest birds require a great diversity of riparian micro habitats (Ammon, 1996). The survey showed that large stands of multi-layered forests with a dense shrub understory and snags have a higher occurrence and greater species diversity than stands with low structural diversity. Because of the correlation between vegetative diversity and bird species richness, total bird abundance was highest in the upper half of the canyon and lowest in the lower part of the canyon where much of the riparian area has been lost. Because riparian habitats are of critical importance to wildlife, in particular some species of neo-tropical migratory birds, and because this type of habitat has been greatly diminished in Diamond Fork and throughout the region, there is a concern that the group-site campground be located in an area that minimizes direct and indirect impacts on riparian habitats.

Riparian zones not only provide habitat for a variety of plants, animals, and birds, they also provide other invaluable benefits. Riparian zones filter sediment and pollutants from

stream systems, provide aquifer recharge and flood abatement. Riparian zones also provide food and energy to a stream system in the form of leaf litter and debris, provide large woody debris to a river which creates complex habitat for fish and other aquatic species, and provides shade to keep cold water fishery streams intact. All these functions have been impacted in Diamond Fork for various reasons.

Wetlands: Like riparian zones, wetlands are important habitats for both terrestrial and aquatic plants and animals. Additionally, wetlands capture and filter sediment, hold back water during flood events, and filter pollutants. Wetlands can either be found in the floodplains of rivers and streams or isolated from watercourses.

Measurement indicators used to compare the alternatives include: a) a quantitative description of riparian area disturbed by construction activities, and b) a qualitative description of the effects of human impacts (trampling/ trailing) on the critical vegetation.

Affected Environment

Much of the riparian forest along the margin of the Diamond Fork floodplain was cleared for agricultural use prior to 1939. Since 1939, the area of mature cottonwood forest along Diamond Fork Creek downstream of Brimhall Canyon has declined by approximately 85%. This change is primarily the result of prolonged high flows resulting from the transbasin diversion of irrigation water from Strawberry Reservoir to the Bonneville Basin. High irrigation flows, combined with high sediment loads, resulted in high rates of bank erosion and lateral channel migration. The reduction of channel and bank stability allowed the large magnitude floods in 1952, 1983 and 1984 to cause major changes in channel and floodplain morphology. Also, changes that previously occurred only during relatively large floods now occur throughout the duration of the irrigation season, resulting in nearly continuous, rapid channel movement. This movement has affected riparian zones along Diamond Fork Creek.

Cottonwoods and willows have evolved to release their seed in late spring to coincide with the decline of stream flows during the spring snowmelt. Seedling establishment normally occurs on bare moist sites with newly deposited fine sediment. Young seedlings are highly sensitive to changes in water elevations and flooding and can be killed by lack of groundwater during the growing season, stream scour and movement and/or inundation (flooding) during the growing season. The transbasin diversions in Diamond Fork have resulted in a stream flow that inhibits the recruitment of willows and cottonwoods because, on average, irrigation flows are higher, and occur later, than the natural spring flood peaks. In lower Diamond Fork, the peak period of cottonwood seed dispersal occurs approximately from mid- to late-June. Peak water demand typically occurs during the last week of June to the first week of July so that most or all of the surfaces on which cottonwood seedlings might establish are under water. The result has been that cottonwood establishment is limited to infrequent large flood events that are bigger than the irrigation releases in that particular year (as few as 3 occurrences during the period 1922-1997), when it would be expected to occur in the majority of years under

normal conditions. Recreation use and livestock grazing has compounded this problem in some areas by removing additional vegetative reproduction of cottonwoods.

At the same time, the susceptibility of the channel to major changes during large flood events, combined with the nearly continuous channel movement under the irrigation flow regime has resulted in a long-term downward trend in forested riparian habitat. Field coring of mature stems reveals the majority of cottonwoods to be about 50-60 years in age, with narrowleaf cottonwood expected to survive, on average, to 80-90 years in this drainage (Winward, 1997). Given these estimates, a large proportion of the existing mature trees will die in the next few decades and there appears to be little recruitment to replace them.

The main exceptions to this trend are the apparent short-term recovery of channel and riparian areas following the large flood events of 1952 and 1983-84 and those areas where coyote willow (*Salix exigua*) has become dominant. Coyote willow appears to be more tolerant of fluctuating water tables during the growing season than cottonwood and is dominant in areas where summer water tables are higher--for example, in the reach immediately above Lavanger Hollow. This reach remains highly susceptible to change during high flood events due to the high in-channel sediment load and the extensive occurrence of high exposed banks.

The remaining cottonwood forest in Diamond Fork supports a diverse, multi-layered understory of grass, forb and shrubs. The loss of cottonwoods in the canyon included the loss of associated understory species as well. Coyote willow stands are considerably different from cottonwood in composition, structure and ecological function. Coyote willow forms dense stands that are homogeneous in structure with little understory. It is restricted to streamside areas and is not likely to expand across the width of the valley bottom. Because of its small stem size, willow does not contribute large woody debris to the channel and therefore does not influence the development of channel structure (e.g. development of pools) in the same way as cottonwood.

The area of cottonwood forest above Brimhall Canyon has declined by 25-50% since 1939. Irrigation flows have had a large impact on riparian habitats in this reach but this area has had additional impacts due to road and campground construction and grazing and has, in general, had more impacts from recreational and other uses. Most recently, construction of the Diamond Fork road and pipeline resulted in the loss of more than 15-20 acres of forested riparian habitat, and planned repair and maintenance of the Dry Canyon dispersed campsites will result in the loss of another 0.3 acres of riparian forest. This activity has added to the fragmentation and loss of riparian habitat for neo-tropical migratory bird species that are directly tied to the riparian corridor. These activities reduce the ground cover which is important for all riparian species nesting and foraging in the area. The loss of nesting and foraging habitat could result in lower reproductive success, potentially lowering the number of individuals in a population.

Riparian communities in the lower canyon are typically dominated by narrowleaf

cottonwood, with a midstory of willow, birch and dogwood in wetter sites, or skunkbrush, Wood's rose and hawthorne in drier sites. The understory may include a variety of forbs, grasses and grass-like species (sedges, rushes, horsetails), with the mix of species varying with the local microsite conditions, particularly soil moisture. Review of aerial photos from the 1930's show considerable loss of cottonwood gallery forest in the lower 3-4 miles of the canyon, due to agricultural clearing and channel movement (URMCC/USDA, 2000). Past grazing likely altered the understory composition, resulting in an increase in Kentucky bluegrass, and limited regeneration of cottonwoods.

Environmental Effects

Alternative 1

Under the No Action Alternative the group-site facility would not be constructed and there would not be any direct impacts on riparian habitats. Without a group-site campground in Diamond Fork, some campground users would be displaced to the existing Diamond Fork Campground where they would occupy several adjacent sites or to dispersed areas throughout the canyon. Indirect impacts on riparian habitats could occur by displaced users who disperse camp in the form of soil compaction, illegal gathering of wood, and the creation of unclassified trails. These impacts would be mitigated by signing, hardening of trails, and directing the public away from sensitive areas. Indirect impacts on riparian habitats would be similar or potentially greater for users displaced to dispersed areas as access and activities cannot be as closely managed.

No direct or indirect impacts to wetlands would occur with Alternative 1. No construction would take place and no water developments would be needed to supply the campground.

Alternative 2

Construction at this site would be outside the active floodplain and in areas previously cleared for hay fields. There would be negligible direct impacts on riparian habitats from construction activities.

The site consists of former cultivated fields that were once part of the floodplain and riparian area bordering Diamond Fork Creek. Survey work conducted in 1998 shows that this section of Diamond Fork Creek has degraded approximately 3.5 feet, resulting in abandonment of parts of the former floodplain. Parts of the proposed site occupy floodplain surfaces that were flooded as recently as 1984. Older aerial photographs show that the site was flooded in previous years by floods of lesser magnitude (1952, 1969, and 1975). Aerial photographs of the site taken in 1939 show a riparian forest dominated by mature cottonwoods with a maximum width of about 650 feet. This is the likely width of the active floodplain at the time. Areas occupied by cottonwoods in 1939 are now 3.5 to 8 feet above the present floodplain. The present floodplain width in this reach, in places, is less than 200 feet. Lateral migration rates averaging 40 feet per year have been observed. Much higher erosion rates may be realized in the largest flood years without the protection afforded by a healthy riparian system. The new flow regime will diminish the rate of lateral migration of the river channel.

Indirect impacts on riparian habitats would result from campground users traveling through riparian areas. Indirect impacts would include soil compaction, illegal gathering of wood, and the creation of unofficial trails. It is difficult to predict the exact location and extent of these indirect impacts. Indirect impacts would be mitigated by proper signing and travel management.

This site has potential for regeneration of a riparian forest through planting and irrigation on an area approximately 25 acres in size. Building and operating a campground here would limit the total acreage that could be planted in cottonwoods to approximately six to ten acres.

No wetlands would be impacted by construction of a group campground at this site. Water for the campground would be obtained by drilling a well on site. State of Utah water right laws would be followed prior to construction activity.

Alternative 3

Brimhall

The Brimhall site would be constructed both in the active floodplain and adjacent uplands and would result in direct impacts to approximately 1.5 acres of riparian vegetation at the site, about 0.1 percent of the total riparian habitat in the watershed. Site limitations would require that portions of the proposed facility are constructed on the 100-year floodplain. Hardening of surfaces would restrict opportunities for cottonwood regeneration from colonial sprouting suckers, as would other activities associated with heavy human use adjacent to hardened sites (e.g. trampling, wood cutting). Mature trees on this site may continue to provide shade for another few decades, but with limited regeneration these small clones should be expected to dwindle in size. A patch of willows and other facultative wetland shrubs occurs at the mouth of Brimhall Canyon on an old flood surface surrounded by upland vegetation. This patch is likely supported by subsurface flows and could be impacted by construction. Indirect impacts would be similar to alternative 2 and proportionally more intense because of the closer proximity to the riparian area.

No water would be developed at this site. No wetlands would be impacted by construction at the Brimhall site.

Wanrhodes

The proposed site is adjacent to Wanrhodes Creek which has a much smaller riparian zone than exists on Diamond Fork Creek. The Wanrhodes Creek site would be located outside of the narrow riparian fringe that borders Wanrhodes Creek. There would be less than 0.1 acre direct impact on riparian vegetation. Indirect impacts from campground users would be similar to those described for Alternative 2. The riparian area adjacent to the road would not be impacted if the road was widened. Road widening would occur on the uphill side of the road, farthest away from the riparian area.

No wetlands would be impacted by construction at the Wanrhodes site. No water would be developed at this site.

Monks Hollow
Construction at the Monks Hollow site would be outside the active floodplain and there would be less than 0.1 acre direct impact to riparian vegetation. Indirect impacts from campground users would be proportionally similar to those described for Alternative 2.

Development would be centered in areas occupied by upland plant communities. Cottonwoods at this site are generally mature and many have been previously damaged by recreation use. Regeneration has likely been reduced because of heavy dispersed camping use, at least along the north side of the creek. The project area on the north side of the creek lies mostly on top of rock fill material, created from drilling of the Diamond Fork Tunnel and deposited between the road and the active flood plain. This material has been shaped to blend with existing contours, capped with topsoil, and reseeded/replanted with native upland vegetation.

Water for this site would be developed from a spring in Red Hollow approximately 0.8 miles up Forest Road 492. Flow measurements were taken in December 2002 by the Uinta National Forest Engineering Group. Measurements indicate the spring was producing water at the rate of approximately 0.1 cfs. This equates to 65,000 gallons per day. The site discharges directly into Red Hollow and supports a small riparian community adjacent to the streambanks. Approximately 1,375 gallons per day, or 2.1 percent of the daily spring discharge, would be needed for the campground when it is at full capacity (275 PAOT) based on an average consumption of 5 gallons a day per person. The small percentage of spring discharge used for the campground would leave more than adequate flow in the Red Hollow channel for riparian maintenance.

Water would be diverted from a collection box located near the spring source. Less than 0.1 acres of riparian would be directly impacted through installation of the collection facility. The collection area would be fenced off from wildlife and/or domestic livestock to protect the integrity of the spring. When the storage tank is filled to capacity, water diverted from the spring would be returned to Red Hollow via an overflow line. Approximately 1.0 mile of pipe would be installed from the spring to the campground. Approximately 0.2 miles of this distance would be a new temporary disturbance. The remainder would be installed in Forest Road 492 alignment. Installation of the 10,000 gallon water tank would constitute approximately 0.5 acres of disturbance in a previously disturbed upland bench area below the spring source. Standard Best Management Practices would be utilized to minimize erosion and impacts to riparian vegetation during and after construction activities.

Currently, the Forest Service has a water right for livestock watering along Red Hollow. This water right is part of a larger water right that includes the entire Diamond Fork Grazing Allotment (the allotment). The Forest has a water right for 4,893 cattle for an entire year within the allotment. The Utah Division of Water Rights calculates that each

cow uses 0.028 acre-feet of water in a year. Since cattle are only permitted on the Diamond Fork Grazing Allotment for 127 days this would amount to 13,672,949 gallons of water used in one grazing season. The Forest has a water right for 44,639,849 gallons of water in the Diamond Fork Grazing Allotment. Therefore, the Forest Service has approximately 30,966,900 gallons of surface water available in the allotment annually. At full capacity, the campground would need approximately 368,402 gallons of water total for 5 months (May 15th through October 15th). The 368,402 gallons required for the campground, less than 0.1% of the water right, would be converted from stock water to domestic use.

In addition the Diamond Fork Allotment is managed with a three unit rest rotation and Red Hollow in particular is managed for big game. As a result the Red Hollow area is rested two years out of three from livestock grazing. When the Red Hollow area is grazed it is managed with a grazing unit that is approximately eight times its size. Therefore, the density of use in the Red Hollow area is significantly less than the 2,124 pairs permitted in the Unit.

Alternative 4

In addition to the impacts described for the Monks Hollow site under alternative 3, there would be a direct impact to approximately 0.1 acres of riparian vegetation with the construction of the foot bridge connecting the 75 PAOT walk-in site with the parking area located on the north side of Diamond Fork Creek. The administrative-access road from the Monks Hollow trailhead to the walk-in site would have a direct impact on an additional 0.34 acres of riparian vegetation (although an existing dirt road void of existing vegetation is included in a portion of that amount). The total impact of 0.44 acres is about 0.03 percent of the total riparian habitat in the watershed. A culvert would be installed over Monks Hollow Creek improving the existing low water crossing. All developed campsites would be constructed out of the 100-year floodplain.

Indirect impacts on riparian habitats from visitor use would be proportionally similar to Alternatives 2 and 3. The potential for riparian restoration at this site is less than what is proposed in Alternative 2, primarily because the historic floodplain is not as wide and the riparian corridor was not cleared for agricultural use.

Measures would be taken through design and construction phases as well as during post-construction management of facilities, to preserve cottonwoods and promote regeneration. The shade provided by these trees is desired and maintenance of the health of mature trees is important to visitor safety. In order to provide long-term shading, there must be adequate recruitment to replace aging and dying trees. This can be accomplished by assuring that recruitment areas are not hardened and that they are protected to allow vegetative shoots (suckers) to establish.

Providing access to the stream from the campground site in the form of designated trails would limit, but not eliminate, indirect impacts to riparian vegetation. Trails could be located through less sensitive areas and signing and educational materials provided to

encourage campground users to stay on the trails. Wood cutting would be prohibited to protect regeneration of willows and cottonwoods.

Development of the Red Hollow spring in the Monks Hollow section in Alternative 3 would be considered in Alternative 4 as well. However, the increased capacity of the campground facility would require more water when the campground is full. Approximately 2,375 gallons per day, or 3.7 percent of the daily spring discharge, would be needed for the campground when it is at full capacity (475 PAOT) based on an average consumption of 5 gallons a day per person. The small percentage of spring discharge used for the campground would leave more than adequate flow in the Red Hollow channel for riparian maintenance.

ISSUE 3. UTE LADIES'-TRESSES

There is a concern that construction of the group-site facility and associated visitor use could have detrimental effects on the Ute Ladies'-tresses orchid (*Spiranthes diluvialis*) (ULT), a federally listed threatened plant within the Spanish Fork River drainage.

Affected Environment

The ULT, federally listed as "threatened", is found along the main stem of Diamond Fork from the mouth of the canyon to Three Forks. It occurs as scattered populations, or colonies, in riparian areas generally within the river's 100 year floodplain. Inventory efforts have identified 77 colonies occurring on more than 40 acres. The total number of flowering plants fluctuates greatly from year to year. In 2001, a record number of plants were noted: counts estimated over 26,000 flowering individuals. In recent years, populations along Diamond Fork have received only minimal impacts from human-related activities (occasional trampling by fishermen, researchers, and livestock) which have not appeared to be detrimental. Herbivory from rodents is considered as perhaps the most limiting current impact (Jordan, 2003), followed by fluctuations in the water table. The plant is believed to be dependent on disturbances such as flooding to create suitable habitat to establish seedlings. It is considered to be an early seral species, colonizing on relatively recently-deposited surfaces within active river channels (USFWS, 1995), though several populations are known from spring/meadow sites in Utah county. Many of the colonies in Diamond Fork occur on depositional surfaces created by the floods of 1983-84. ULT reproduction depends on insects, particularly a few species of native bees and the honeybee. Bees have apparently been declining throughout the western United States, and indications are this has also occurred in the Diamond Fork drainage (Pierson and Tepedino, 2000). Wood debris piles have been constructed in recent years to improve honeybee habitat in Diamond Fork.

Presently, plant succession may be reducing the overall suitability of existing habitat for ULT along Diamond Fork. Invasion by coyote willow, a natural successional pattern, results in shading in many colonies. ULT is believed to prefer more open habitats on newly developed flood surfaces and plant densities have been observed to be lower where

the species is shaded. The development of new habitat, which results primarily from larger flood events, may not occur for years or decades. Plant succession may begin reducing Ute-ladies'-tresses densities causing a temporary decline in ULT populations until the next major flood event. Weeds also pose a threat to ULT, with aggressive exotic species such as tamarisk (*Tamarix ramosissima*), perennial pepperweed (*Lepidium latifoluim*), Canada thistle (*Cirsium arvense L.*) and Russian olive (*Elaeagnus angustifolia*) present in the drainage. Each of these four species has the potential to dominate riparian plant communities as seen along the lower Spanish Fork River and throughout the western U.S. The orchid can be negatively affected both by competition for space and resources, and from shading.

Environmental Effects

Measurement indicator used to compare the alternatives: A qualitative description of the habitat directly affected by the campground development activities as well as potential indirect habitat impacts from visitors.

Alternative 1

There would be no direct or indirect impacts to UteLadies'-tresses under the No Action Alternative. Effects from unmanaged recreation will continue.

Alternative 2

In 2001, the largest flowering year on record for ULT in Diamond Fork, the 19 colonies closest to the proposed campground included 22,207 flowering individuals. This accounted for approximately 84% of the total number of flowering plants counted in Diamond Fork that year (26,344 plants). In 2003, these colonies included 729 flowering individuals - more than 70% of the canyon-wide count (1,040 plants). This site has the highest density of flowering plants in the canyon.

There would be no direct impacts from construction on ULT and its habitats. Facilities would be located and designed to avoid low-lying areas which are habitat to ULT and which are otherwise not suitable for development because of high water tables and frequent flooding. Mitigation measures would be implemented to ensure that there are no direct effects to ULT populations. The measures include temporary fencing of habitat during construction and assignment of an inspector to assure that habitat is not damaged. Similar measures were very successful in the reconstruction on the Diamond-Palmyra Campground.

Indirect impacts on ULT and its habitats would be greater under this alternative than any other. Approximately 19 colonies of ULT lie in riparian areas immediately adjacent to the site under this alternative. The impacts would be from increased human trailing through the populations, and illegal firewood collection reducing pollinator nesting habitat. Mitigations such as designated trails and bans on collection of fuelwood would be implemented to minimize such impacts, though total compliance is unlikely.

Alternative 3

Brimhall

There would be no direct impacts on Ute ladies'-tresses. The nearest ULT colony is located approximately 100 yards above the upstream edge of this site, on a sharp bend in the river. The nearest downstream colony is located approximately 1/3 mile from the lower end of this site. This colony has a one-year maximum of 17 flowering individuals, recorded in 1998. This represented only 0.1% of the plant population in Diamond Fork Canyon.

Campground users would be most likely to trail through the upstream colony, although reaching it would likely require walking along the Diamond Fork Road rather than along the creek banks as rock riprap and a concrete retaining wall make access along the stream difficult. Therefore, indirect impacts on these sites would be minimal.

Wanrhodes

There would be no direct or indirect impacts on Ute ladies'-tresses. ULT have not been found in Wanrhodes Canyon. For much of its length the stream is entrenched and confined to a narrow channel, with little riparian or wetland development within the incised channel. Recent surveys of upper Wanrhodes Canyon, by Forest Service personnel in 2000, revealed little potential habitat for the species.

Monks Hollow

The nearest upstream colony of ULT is approximately 1.5 miles away; the nearest downstream colonies are near the existing Diamond-Palmyra Campground, also about 1.5 miles away. No direct or indirect effects to the species are expected from construction or use of group sites here. There is potential habitat for ULT but no known actual orchids in a very small (about 0.025 acre) wetland on the terrace on the south side of the creek, but under this alternative there are no plans to extend the campground south of the creek. Therefore, there would be no direct and negligible indirect effects to ULT or habitat from this alternative. There is no ULT habitat in Red Hollow and therefore no effect from development of the spring water source.

Alternative 4

Most direct effects would be similar to those described for the Monks Hollow site under Alternative 3. However, this alternative would extend the campground construction activities and boundaries onto the area south of Diamond Fork Creek, with construction of a new access road, a new footbridge across the creek, and campground units. The construction activities would not involve direct effects to TES plants. Indirectly however, extending recreational access to the terrace south of the creek is likely to result in impacts to the very small grass/rush/forbs wetland (about 0.1 acre, including about 0.025 acre of potential ULT habitat) on the far eastern side of the terrace, just outside the formal boundary of the campground.

This small wetland is outside the designated campground zone, but it is adjacent to it, and would be attractive to recreationists. This wetland already receives moderate to heavy trampling from livestock. The potential exists for extensive indirect impacts of wetland vegetation both on the slope and the terrace if sustained human trampling occurs. Protection efforts are being included as part of this alternative which include fencing and interpretive signs of both slope and terrace wetland and establishment of deterrent vegetation with appropriate warning signs. Fencing would effectively exclude the cattle. Typical Forest Service built fencing is unlikely to completely exclude humans, but would likely reduce their impacts to acceptable levels. If monitoring showed unacceptable levels of impacts, additional protection measures would be necessary.

OTHER ISSUES

WATERSHED AND WATER QUALITY

Affected Environement

Diamond Fork Creek is a tributary of the Spanish Fork River and has a drainage area of 156 square miles. Analysis area for environmental and cumulative effects will include the Diamond Fork watershed from Three Forks to its confluence with the Spanish Fork River. Elevations in analysis area range from roughly 5,000 feet at the mouth of Diamond Fork Creek to 8500 on Teat Mountain. Average precipitation is about 20 inches per year. Average annual precipitation varies from 24 inches at higher elevations to14 inches near the confluence with the Spanish Fork River.

Soils in the western half of the watershed consist of limestone, sandstone and shale. Soils in the eastern half of the watershed, east of Red Mountain, consist of conglomerates and interbedded shale and sandstone. Erosion rates are generally higher in the eastern part of the watershed in areas underlain by the North Horn Formation and Green River Shale.

Currently, Diamond Fork from the confluence with the Spanish Fork River to the Sixth Water confluence is a Class 3A Water (Protected for cold water species of game fish and other cold water aquatic life, including the necessary aquatic organisms in their food chain). Diamond Fork Creek is currently listed on the 303(d) list as a Category 4C water. Category 4C waters are impaired for one or more designated uses and do not require development of a TMDL. Furthermore, the impairment of Category 4C waters is not linked to a specific pollutant. In the case of Diamond Fork, the impairment is due to riparian habitat and flow alteration as a result of the CUP. With completion of the Diamond Fork Tunnel and Pipeline in the spring of 2004, flows released into Diamond Fork will be managed at levels allowing restoration of in stream and riparian habitat from the outlet of the old Strawberry Tunnel down to the Spanish Fork River.

From early 1915 to spring of 2004, natural flows during the growing season were dramatically augmented with irrigation flows from the Strawberry Reservoir. The timing, magnitude, and duration of flows compared to the natural flow regime led to continually affected sediment transport characteristics, channel and bank stability, and channel geometry. Consequently, the channel has been and continues to be inherently

unstable. A bedload transport model run by the Uinta National Forest estimated that irrigation flows from 1915 through 2004 resulted in the Diamond Fork to produce approximately 3.5-4 times (~ 18,000 tons/year) more bedload than natural rates (5,000 tons).

Macroinvertebrate health will be impacted until the channel reaches post-irrigation flow equilibrium. Monitoring data collected by the Forest in 1978, 1979, 1989, 1990, 1993, 1994 and 2001 (USDA 2001) shows fluctuation between poor and excellent water quality conditions during those years. There is no trend in macroinvertebrate water quality data over time as irrigation demands were variable from year to year (USDA 2001).

Chemical water quality data through 2001 indicates high phosphorus levels, directly correlated with increased erosion from excessive channel flows from irrigation deliveries. All other data collected by the Uinta National Forest indicates chemical water quality in Diamond Fork to be stable and of good condition. It is anticipated that returning to natural flow regimes will greatly reduce sediment input and transport in the Diamond Fork Creek and water quality will improve over time. This is discussed at length in the Central Utah Project-Bonneville Unit Diamond Fork System FEIS and Supplementals (USDI 1984).

Environmental Effects

The Disturbed WEPP and WEPP Road Models were utilized to analyze the effects of the alternatives on sediment delivery to Diamond Fork. The Technical Documentation for each of these models, including applications, limitations, and explanation of variables is available in the project record or on the worldwide web at http://forest.moscowfsl.wsu.edu/fswepp/.

Buffers incorporated into the model included riparian and 100 year floodplain, where no disturbance is proposed. Effects of the proposed action in the alternative footprints were modeled by increasing the impermeable surface and decreasing overall vegetative cover and compared to modeled existing conditions. The entire project footprint for each alternative was analyzed as "disturbed", when in actuality; only a fraction of the total acreage will be impacted by the proposed action. In some cases, differences in slope, discontinuity of project footprint, or differences in vegetation type resulted in multiple model runs to account for variation. This method essentially models the "worst case scenario" or highest possible sediment yield for each of the alternatives. Modeled results for each of the alternatives did not yield significant amounts of sediment (0.01-0.04 tons/acre) leaving the buffer. However, the model does not account for use of Best Management Practices (BMPs) or erosion control features to minimize sediment transport. The incorporation of construction BMPs, erosion control measures, and site revegetation into the proposed action will further reduce potential for sediment transport. Recommended erosion control features and BMPs are listed in Chapter 2 , Mitigation Measures Common to all Alternatives, and Appendix 1. The effect of each alternative is discussed below.

Alternative 1
Under the No Action Alternative, no new campground facilities would be constructed and there would be no direct effect to water quality. Indirect effects may include unauthorized dispersed camping along the Diamond Fork Creek corridor, resulting in increased erosion through soil compaction and loss of vegetation.

Alternative 2
The Lower Diamond Fork site is located on a broad terrace outside the active floodplain and would impact less than 0.1 acres of riparian vegetation. Disturbed WEPP analysis resulted in 0.26 tons of soil movement per year within the project footprint, of which, only an insignificant amount (0.01 tons/acre) would exit the buffer. This model reflects "worst case scenario" and does not account for use of BMPs, erosion control measures, or vegetative enhancement to mitigate sediment transport. Five, 2-unit vault toilet would be installed according to applicable state and federal regulations. The vaulted toilet would eliminate potential surface water contamination from waste. Water quality in Diamond Fork Creek would not be directly affected through this alternative. Indirect impacts may include increases in camper and angler traffic accessing the stream and floodplain adjacent to the campsites. This activity may produce minor and unquantifiable sediment delivery to the stream. Proper trail design, signing, education, and utilization of construction BMPs will minimize potential impacts to riparian habitat, streambank stability, and water quality.

Alternative 3
Brimhall
The proposed campground at the Brimhall site is on the southeast side of Diamond Fork Creek at the mouth of Brimhall Canyon. Paved parking facilities would be located on the north side of Diamond Fork Creek with foot access to the campground via existing bridge. Due to space limitations at this site, 1.09 acres of the parking area and campground would be constructed within the active floodplain and approximately 1.5 acres of riparian vegetation would be impacted. WEPP Road modeled insignificant (0.83 pounds/year) production of sediment generated from the parking area. The incorporation of construction BMPs, erosion control measures, and site revegetation into the proposed action will further reduce potential for sediment transport. One, 2-unit vault toilet would be installed according to applicable state and federal regulations. The vaulted toilet would eliminate potential surface water contamination from waste.

Modeled post project sediment yield for the campground area (Brimhall South) resulted in insignificant increases in upland erosion rates (0.04 tons/acre) within the project footprint, of which, approximately 0.01 tons/acre would exit the buffer. This model reflects "worst case scenario" and does account for use of BMPs, erosion control measures, or vegetative enhancement to mitigate sediment transport. The incorporation of construction BMPs, erosion control measures, and site revegetation into the proposed action will further reduce potential for sediment transport. Water quality in Diamond Fork Creek would not be directly or indirectly affected through this alternative.

Wanrhodes
The Wanrhodes site is located on a sloping terrace adjacent to the Wanrhodes Canyon road and approximately three miles up from its confluence with Diamond Fork Creek. Two, 2-unit vault toilets would be installed according to applicable state and federal regulations. The vaulted toilets would eliminate potential surface water contamination from waste.

The Disturbed WEPP model resulted in no net increase of erosion within the project perimeter or sediment leaving the buffer. Erosion control measures and utilization of BMPs during construction will further mitigate potential sedimentation. Water quality in Wanrhodes Canyon or Diamond Fork Creek would not be directly or indirectly affected through this alternative.

Monks Hollow
The proposed site for Monks Hollow under this alternative will include much of the marginally vegetated staging and spoil area for the Tanner Ridge Tunnel and Red Hollow Pipeline, a feature of the Diamond Fork System. The construction footprint is located wholly above the 100 year floodplain and removed from the immediate riparian corridor. Designated trails would be constructed along the Diamond Fork Creek and would provide focused visitor and angler access to the stream. The trail would incorporate design features and construction BMPs to minimize soil disturbance and potential for erosion.

Following completion of the Central Utah Project - Diamond Fork System, the staging area was recontoured, covered with topsoil, and revegetated with limited success. Disturbed WEPP modeled for this site reflects existing conditions with upland erosion rate of 0.13 tons/acre within the proposed project footprint and an insignificant amount sediment (0.01 tons/acre) leaving the buffer. Utilization of BMPs and protection of the riparian area and floodplain during implementation of the Diamond Fork System resulted minimal impact to water quality.

The modeled increase in impermeable surface yielded a post-implementation increase in the upland erosion rate (0.30 tons/acre) within the construction footprint. Modeled results also predicted that an insignificant amount of sediment produced (0.02 tons/acre) would exit the buffer if the vegetative cover remains constant. The incorporation of construction BMPs, erosion control measures, and increasing vegetative cover in the construction footprint and riparian/floodplain buffer into the proposed action will further reduce potential for sediment transport.

A spring located in Red Hollow would be developed to supply water to the Monks Hollow site. The development will include installation of a 10,000 gallon water storage tank, hypoclorinator, one mile of buried pipeline, and 0.75 miles of distribution line. Use of construction BMPs and erosion control measures will mitigate potential sediment generated from installation of the water system. Four, 2-unit vault toilet would be installed at the Monks Hollow site according to

applicable state and federal regulations. The vaulted toilets would eliminate potential surface water contamination from waste.

Water quality in Diamond Fork Creek would not be directly affected through this alternative. Indirect effects may include increases in camper and angler traffic accessing the stream and floodplain adjacent to the campsites via the interpretative trail. This activity may produce minor and unquantifiable sediment delivery to the stream. Proper trail design, signing, education, and utilization of construction BMPs will minimize potential impacts to riparian habitat, streambank stability, and water quality.

Alternative 4

The proposed site under this alternative includes the same area described under Alternative 3 as well as an area adjacent to Monks Hollow trailhead (southwest of Monks Hollow), and a walk in site on the southeast side of Diamond Fork Creek. Campers would access this latter site via a footbridge from the North Monks Hollow area. Administrative vehicular access to the walk-in site (Southeast Monks Hollow) would be via the existing bridge at Monks Hollow, across Monks Hollow Creek, and then follow an existing native surface road for approximately 0.2 miles. An additional 0.2 miles of native surface road would then be constructed to access the site. The portions of the administrative access road constructed in the 100-year flooplain and impact approximately 0.44 acres of riparian area. A total of five, 2-unit vault toilets would be installed throughout the Monks Hollow site according to applicable state and federal regulations. The vaulted toilet would eliminate potential surface water contamination from waste.

Disturbed WEPP modeling resulted in no increase in upland erosion rates for both the Southeast and Southwest Monks Hollow areas and no discernable amount of sediment leaving the buffers. WEPP Road modeled results for the administrative access road between the Monks Trailhead and the Southeast walk-in site yielded insignificant (61-84 pounds of sediment/year) road prism erosion and zero sediment leaving the vegetative buffer. The incorporation of construction BMPs, erosion control measures, and increasing vegetative cover in the construction footprint and riparian/floodplain buffer into the proposed action will further reduce potential for sediment transport.

ENDANGERED, THREATENED AND SENSITIVE PLANTS

Affected Environment

Two other federally listed endangered plants occur within Utah County: clay phacelia (*Phacelia argillacea),* Deseret milkvetch (*Astragalus desereticus*). Both clay phacelia and Deseret milkvetch are very narrowly endemic. Clay phacelia is found only on particular slopes of Green River Shale and is known from only 3-4 sites above Mill Fork in Spanish Fork Canyon. Deseret milkvetch is known from a single population occurring on sandy soils derived from sandstone outcrops of the Moroni Formation near Birdseye, along Highway 89. Habitat does not exist for either of these species in or near the project areas. There is potential habitat for clay phacelia within the Diamond Fork drainage, but

it is well upstream and beyond the project areas (Campellone, 2001, Campellone 2002, Heaton, 2001).

Sensitive Species

Of the six sensitive plant species known to occur on the Forest, or to have potential habitat within the Forest, none are believed to occur along or near Diamond Fork Creek. Garrett's bladderpod (*Lesquerella garrettii*) and rockcress draba (*Draba globosa)* are high-elevation species (subalpine and alpine), known in the Wasatch Mountains from only the highest ridges and peaks. Barneby woody aster (*Aster kingii var barnebyana*) is known only from Mount Nebo in the Wasatch Range, but the taxonomically similar King woody aster occurs throughout the Wasatch. However, it is known only from limestone cliffs. The cliffs in lower Diamond Fork are primarily sandstone and none occur within proposed project sites. Wasatch jamesia (*Jamesia americana var. macrocalyx*) is also restricted to cliff habitats, but has not been found in the lower Diamond Fork drainage (Van Keuren, 2002). Like the Aster, this Jamesia seems to prefer limestone cliffs to other types. Dainty moonwort (*Botrychium crenulatum*) and slender moonwort *(Botrychium lineare)* are known in Utah only from sites higher than 9,000 feet elevation, though could occur lower if the site was cool and moist enough (Farrar, 2004). The sites of the alternatives considered here are too dry and warm to be likely habitat for these two species, even in the wet riparian areas. Of the two species, slender moonwort is slightly more likely to find suitable habitat, but the species has actually been found fewer times in Utah than has dainty moonwort (Farrar, 2004).

Environmental Effects

All Alternatives

There would be no direct or indirect impacts to clay phacelia, Deseret milkvetch, Garrett's bladderpod, rockcress draba, Barneby woody aster, Wasatch jamesia, Dainty moonwort and slender moonwort due to their lack of habitat or occurance along Diamond Fork Creek and the proposed group sites.

ENDANGERED, THREATENED AND SENSITIVE FISH AND WILDLIFE

Affected Environment

ENDANGERED AND THREATENED

The United States Fish and Wildlife Service (USFWS) list the following federally protected Proposed (P), Endangered (E), and Threatened (T)) animal species that have the potential to occur in the project area: Bald eagle (*Haliaeetus leucocephalus*) (T), Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*) (P), Canada lynx (*Lynx Canadensis*) (T), June sucker (*Chasmistes liorus*) (E), and the Utah valvata snail (*Valvata utahensis*) (E).

Bald Eagle Bald eagles require habitat that will provide them with open water for feeding and large, mature trees for nesting, roosting, and perching. The winter habitat used by eagles includes lakes, streams or rivers for feeding (USDA 2003). There are only four known breeding occurrences in Utah for bald eagles, none of which occur on the Uinta National Forest (UDNR 2003). Bald eagles use the Diamond Fork Creek riparian area for winter foraging and roosting habitat. Eagles were sighted along the Diamond Fork Creek area from Highway 6 to the Diamond Campground during the winter of 2003-2004 (USDA 2004a). There are no known nest sites within the Diamond Fork watershed.

Western Yellow-billed Cuckoo The western yellow-billed cuckoo requires large blocks (greater than 25 acres) of riparian habitat (particularly woodlands with cottonwoods and willows) with dense understory foliage (USDI 2001). Their diet consists mostly of hairy caterpillars but they will also eat cicadas, beetles, grasshoppers, crickets, other insects, berries, frogs and lizards (Stokes 1996). The western yellow-billed cuckoo is rare in Utah. The May 2003 Natural Heritage database shows 35-40 sightings in Utah. Nesting habitat for the cuckoo is found at low to mid-elevations (2500-6000 ft) (Parrish et al 2002). Even though suitable habitat does exist within the Diamond Fork drainage (riparian habitat with elevations ranging between 5000-5500 feet), no western yellow-billed cuckoos have been found during neo-tropical bird surveys conducted at Billies Mountain (1994, 2000), Two Tom Hill (1994, 2000, 2004) along Diamond Fork Creek (1999-2002, 2004), or in the 1992-2004 Sheep Creek breeding bird surveys.

Canada Lynx The Canada lynx requires high elevation boreal forest habitat of both typical old growth and an early successional structure, relying heavily on snowshoe hare as prey (USDA 2003). There is no habitat in the project area for Canada lynx or snowshoe hares (dense coniferous stands over 7000 feet elevation). Presence of the Canada lynx has not been documented in Diamond Fork. There is a key linkage route along Strawberry Ridge bordering the east side of the watershed. Two lynx were recorded moving through this route in 2004. These lynx moved through the Uinta National Forest quickly (in a few days), and have not settled down to establish a Utah population (Waters 2004).

June Sucker The June sucker is endemic to Utah Lake and may have spawned in streams on the National Forest prior to diversions of streams (UDWR 1998). Although the species was once abundant in Utah Lake, it is now extremely rare. Major causes of the June sucker's decline include flow alterations, pollution, and drought, hybridization with other sucker species, and competition with and predation from exotic fish species. The June sucker is federally listed as endangered, and efforts to help recover the June sucker population are on-going. No habitat or use of Diamond Fork Creek is currently known to exist for June sucker.

Utah Valvata Snail In Utah, this species occurred historically in Utah Lake and prehistorically in other lakes (e.g., Bear Lake) and perhaps rivers (e.g., the Bear River). The species is now considered extirpated in Utah and it appears that its extirpation

occurred sometime around the turn of the century. The existence of a few populations of this species in Idaho suggests that there is the remote possibility that a remnant population could be found in Utah. In the unlikely event that this were found to be so, such a population would almost certainly be somewhere in the northwestern quarter of the state (UDWR 2002).

SENSITIVE SPECIES

The following are designated Forest Service sensitive species having the potential to be located on the Uinta National Forest (Intermountain Region Proposed, Endangered, Threatened and Sensitive Species December 2003): Townsend's big-eared bat (*Corynorhinus townsendii pallescens*), spotted bat (*Euderma maculatum*), fisher (*Martes pennanti*), greater sage-grouse (*Centrocercus urophasianus*), flammulated owl (*Otus flammeolus*), Northern goshawk (*Accipiter gentilis*), peregrine falcon (*Falco peregrinus*), Northern three-toed woodpecker (*Picoides tridactylus*), Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*), Bonneville cutthroat trout (*Oncorhynchus clarki utah*), and Columbia spotted frog (*Rena pretiosa*).

Townsend's big-eared bats Townsend's big-eared bats are known to occur throughout Utah, and are a well known hibernator utilizing caves and mines. Caves or adits are the primary habitat determinants for the species (UDNR 2003). The species utilizes desert shrub, pinyon-juniper, pinyon-juniper-sagebrush, mountain brush, mixed forest, and ponderosa pine forest for foraging habitat (USDA 2003). There is a population of Townsend's big-eared bats in the west Monks Hollow adit approximately 1/2 mile south of the Monks Hollow site. Approximately 40 bats were discovered during a May 1999 survey. Bat gates were installed in the mouths of the adits to protect them from human disturbance.

Spotted bat The spotted bat has been captured in Utah in several habitats including low land riparian, desert shrub communities, sagebrush-rabbit brush, ponderosa pine forest, montane grassland (grass-aspen) and montane forest and woodland (grass-spruce-aspen) (USDA 2003). They use rock crevices high up on steep cliff faces. Cracks in limestone and sandstone with 1-2 inches widths are important roosting sites (UDNR 2003). Surveys conducted at abandon mine sites in American Fork Canyon (Pleasant Grove Ranger District) found occurrences of spotted bats in 1997. There are rock outcrops within the watershed that may provide potential habitat for this species, but will not be directly or indirectly impacted by activities associated with this project. There is no potential habitat within the project area, and therefore no surveys have been conducted. There are no known occurrences of spotted bats in the project area.

Fisher Fishers prefer dense lowland forests and spruce-fir stands with extensive canopy cover. They prey upon small to medium mammals, birds, and carrion of large mammal species. In coniferous forests they concentrate on snowshoe hare. There is no habitat for fishers within the proposed project areas. There is no substantial evidence that fisher historically or currently reside in Utah. There is one photographic record of tracks from 1938 in Summit County, but it is considered speculative (USDA 2003). There is no

coniferous forest habitat in the project areas and no fishers are presently or historically known to inhabit the project areas.

Greater sage grouse Greater sage grouse inhabit sagebrush plains, foothills, and mountain valleys. Sagebrush is the predominant plant of quality habitat (UDNR 2003). On the Uinta National Forest sage grouse are found in the Vernon area of the Spanish Fork Ranger District and in Strawberry Valley on the Heber Ranger District. There is limited sagebrush habitat, and no historic occurrence of greater sage grouse within the Diamond Fork watershed.

Flammulated owl The flammulated owl is an insectivorous species that resides mainly in mixed pine forests. They prefer ponderosa pine but also occur in spruce-fir, Douglas fir, lodge pole pine, aspen and pinyon juniper. They use previously excavated cavities in large diameter trees for nesting habitat (USDA 2003). Limited habitat occurs for flammulated owls within the watershed but not within the project areas. No surveys have been conducted specifically for the flammulated owls. There have been no occurrences of the owls during breeding bird or neo-tropical migratory bird surveys. There is no suitable habitat within or flammulated owls inhabiting the project areas.

Northern goshawk This species is found in several locations throughout the Uinta National Forest. The species utilizes a variety of trees for nesting, using sticks as nest material. Goshawks forage in dense woodlands, but prefer a more open understory for flight purposes (USDA 2003). No northern goshawks were observed in the Diamond Fork Creek #1 (1999, 2002, and 2004) or #2 (2004) neo-tropical bird surveys, or in the Sheep Creek (2001-2004) breeding bird surveys. The only known goshawk territory within the Diamond Fork Creek watershed is on Timber Mountain, located approximately five miles northwest of the proposed Monks Hollow site. This territory was active from 1996 to 2000. No goshawks have been found in yearly surveys from 2001 to 2004, suggesting that the goshawks have abandoned the territory.

The Forest has been monitoring goshawk population trend since 1996 by monitoring territory occupancy (USDA 2004b). Between 13 and 20 territories were monitored annually across the Uinta National Forest. Territory occupancy ranged from 8 to 37 percent during those years, with no strong negative or positive trend over time. The five year average (1999 to 2003) of active territories is 27.6%. Monitoring in 2004 found 30% of the territories active, suggesting that the forest wide population is stable.

No northern goshawks were observed in the Diamond Fork Creek #1 (1999, 2002, and 2004) or #2 (2004) neo-tropical bird surveys, or in the Sheep Creek (2001-2004) breeding bird surveys. The only known goshawk territory within the Diamond Fork Creek watershed is on Timber Mountain, located approximately five miles northwest of the proposed Monks Hollow site. This territory was active from 1996 to 2000. No goshawks have been found in yearly surveys from 2001 to 2004, suggesting that the goshawks have abandoned the territory (USDA 2003c).

Due to a lack of habitat, no goshawks are found in, or in close proximity to any of the project areas considered in the various alternatives.

Peregrine falcon Peregrines typically occupy open country habitats near water. Cliffs are preferred for nesting habitat and they typically prey on smaller birds (USDA 2003). Historical nests are known from above Alpine (Pleasant Grove Ranger District) in the early 1970s and in the canyons east of Utah Lake from the 1930s to the 1960s, but no nests have been found on the Uinta National Forest in recent years. No peregrine falcons were observed in the Diamond Fork Creek #1 (1999, 2002, and 2004) or #2 (2004) neo-tropical bird surveys, or in the Sheep Creek (1992-2004) breeding bird surveys. There is limited potential habitat for peregrines in the Sixth Water Creek area, but no potential habitat within the proposed project areas. There are no peregrine, and no potential habitat within the proposed project areas.

Northern three-toed woodpecker The Northern three-toed woodpecker is associated with coniferous forests, and requires dead trees for cavity nests. They excavate cavities in trees with a 9" dbh or greater located near high insect populations mainly spruce bark beetles (USDA 2003). No nesting habitat is within or adjacent to the proposed project areas, although limited, scattered habitat does occur in the Diamond Fork watershed.

Although this species is widely distributed, it occurs at relatively low densities in most areas. Data for the western Breeding Bird Survey region shows no evidence that population trends of this species have been declining during the past 20 years. The 2004 Uinta National Forest survey data indicates that this species is relatively common in suitable conifer habitats on the Forest (USDA 2004c). They were commonly detected in mature to old spruce-fir and Douglas-fir forest types, and were especially common in these habitats where insects were active.

In 2004, forest-wide surveys for this species were conducted. Birds were detected at 14 of the 43 survey sites (33%). Four of the 14 detections were on the Spanish Fork Ranger District, but none were within Diamond Fork Creek watershed. This is consistent with past neo-tropical surveys in Diamond Fork and breeding bird surveys in nearby Sheep Creek, where no three-toed woodpeckers have been observed.

Along the Alpine Loop on the Pleasant Grove Ranger District, surveys were conducted in a proposed shaded fuel break treatment area. No three-toed woodpeckers were detected.

Random forest surveys in potential habitat were conducted in June 2001 and 2003. The results of the surveys showed that the Heber Ranger District had sites located in Wolf Creek Campground and Bryant's Fork. The Spanish Fork Ranger District had sites located in the Left Fork of the White River and the Nebo Unit. No three-toed woodpeckers were found on the Pleasant Grove Ranger District.

Three-toed woodpeckers have been identified during breeding bird surveys (BBS) located on the Heber Ranger District. Birds were identified in 1997 and 1998 on the Heber

Mountain BBS transect, and in 1996, 2001, 2002, and 2003 on the Soapstone BBS transect (Field Survey Notes on file at Spanish Fork Ranger District).

Three-toed woodpeckers have also been located during neo-tropical migratory bird surveys. Birds were identified on the Heber Mountain #2 in 1995 and 2000. No birds have been located on the remaining Forest transects.

Although the presence of birds has been established on the Forest, no nest sites have been found. The numbers of birds found during these surveys were low in number (1-4), they were consistently found over the years within the studied areas. This suggests that the numbers of birds are stable within the surveyed areas.

Bonneville cutthroat trout Currently most populations of Bonneville cutthroat trout on the Uinta National Forest are fragmented. In Diamond Fork Creek drainage, 2004 survey data indicates remnant populations currently occur only in the headwater reaches of upper Diamond Fork, Cottonwood Creek, Wanrhodes Creek, Little Diamond Creek, Fifth Water, Sixth Water, Chase Creek, Halls Creek, and Shingle Mill Creek. Naturalized populations of non-native brown trout have become well established in the drainage and are successfully competing with native cutthroat trout, thereby suppressing native trout populations (USDA 2004f).

> Lower Diamond Fork (below Three Forks) - Scattered individual remnant Bonneville cutthroat may still inhabit this stream; however, they occur only in very limited numbers due to competition from brown trout. No cutthroat trout were observed in lower Diamond Fork Creek in 2002, 2003, or 2004 surveys.
>
> Upper Diamond Fork (above Three Forks) - Bonneville cutthroat trout do occur in this stream. Population data using indices of overall condition (K factor) for Bonneville here does not show a statistically observable change in the average overall condition of cutthroat trout during the 1976-2004 time periods. The overall condition of cutthroat trout here has historically averaged 0.93, with a low of 0.83 observed in 1976 and a high of 1.08 in 2004. Cutthroat trout densities have averaged 0.28 fish/meter, and range from 0.01 fish/m in 2004 to 0.55 fish/m in 1979. The apparent decline (not statistically significant) is a result of competition with brown trout. 1979 data indicates brown trout comprised 26% of the salmanoid population. 2004 data indicates brown trout comprised 98% of the population.
>
> Wanrhodes Creek – Surveys in 2002-2004 found low water levels in the lower reaches of this stream. Electro-fishing surveys conducted in the isolated pools (beaver ponds and other) found no fish inhabiting this reach. Snorkel surveys conducted in 2003 and 2004 found cutthroat trout in the upper reaches of this stream. During 2003 and 2004, the lower 3.5 miles of Wanrhodes Creek were dry, except for some inter-connected and isolated pools and beaver ponds.

The streams containing populations of Bonneville cutthroat trout are physically isolated (e.g. a natural fish barrier exists) from, and/or are upstream from any of the sites considered in the alternatives (USDA 2004g).

Colorado River cutthroat trout Colorado River cutthroat trout are not endemic to this drainage and are not present within the Diamond Fork drainage (USDA 2004f).

Columbia spotted frogs Wasatch Front populations of Columbia spotted frogs (*Rana luteiventris*) are currently found in isolated springs or riparian wetlands in Juab, Sanpete, Summit, Utah and Wasatch counties. In September 2002, the Utah Division of Wildlife Resources announced the discovery of a new population of Spotted Frogs in Diamond Fork. The spotted frogs were found in wetlands within two miles of the Alternative 2 site. Although spotted frogs were not found upstream of this site, suitable habitat was identified from the mouth of Diamond Fork Canyon upstream to approximately the Diamond Fork Campground. The U.S. Fish and Wildlife Services most recent review of the status of the spotted frog populations along the Wasatch Front found stable, viable and self-sustaining populations of the species distributed throughout the historic range. The USFWS also found that the status of the species continues to improve.

Environmental Affects

Analysis Methods

Data utilized for this analysis includes the *Diamond Fork Area Assessment* (USDA and URMCC 2000); habitat and population surveys from the Utah Division of Wildlife Resources; and Forest Service field surveys. The Diamond Fork watershed has been surveyed for TES terrestrial wildlife and its habitat. The areas along Diamond Fork Creek and upper Sixth Water Creek were surveyed for wintering bald eagles during the winters of 1999-2000 and 2003-2004. Fisheries data include surveys conducted in 2001-2004. Assumptions are made from observation, literature review and experience.

The following species are eliminated from further discussion due to lack of or limited habitat, and from lack of historic occurrence within the Diamond Fork watershed: Canada lynx, June sucker, Utah valvata snail, spotted bat, fisher, greater sage grouse, flammulated owl, peregrine falcon, Northern three-toed woodpecker and Colorado River cutthroat trout. The Northern goshawk is eliminated due to abandonment of their territory and no establishment of a new territory within the watershed.

The bald eagle, Western yellow-billed cuckoo, Townsend's big-eared bat, Bonneville cutthroat trout and Columbia spotted frog are discussed.

Alternative 1

T&E SPECIES, SENSITIVE SPECIES

Under the No Action Alternative the group-site campground would not be constructed and there would be no direct or indirect impacts from construction activities. All species will continue to use the area as it currently exists. There will be potential for direct effects of increased loss of riparian habitat from dispersed group recreational activities within the

riparian corridor that lies between the Diamond Fork Creek and Diamond Fork Road, around Monks Hollow, and in the Wanrhodes area. Indirect impacts include limited human disturbance to bald eagles as a result of uncontrolled dispersed camping, which may preclude the species from using portions of the watershed.

Alternative 2

T&E SPECIES

There would be no direct or indirect impacts on T&E species. This alternative will not impact bald eagles. The habitat at this site does not provide adequate roosting areas, but does provide foraging areas. Bald eagles are only present in Diamond Fork during the winter months. Construction would be completed before the eagles return. The campground would receive most use during the summer and fall months, when eagles are not present, so little human disturbance will occur.

There is no population of, or habitat for the Western yellow-billed cuckoo at this site. Therefore, this species will not be directly or indirectly impacted by implementation of this alternative.

SENSITIVE SPECIES

The Monks Hollow adit which provides habitat to the Townsend's big-eared bat is approximately six (6) miles from this proposed group site. Construction of a group campground would not affect the adit or surrounding area. Due to the distance, users of this campground will not affect bats at this adit. Consequently, there would be no direct or indirect effects to the bats from this alternative.

The proposed group site lies adjacent to lower Diamond Fork Creek. As described in the Affected Environment section, a very limited number of scattered individual remnant Bonneville cutthroats may still inhabit this stream. No cutthroat trout were observed in lower Diamond Fork Creek in 2002, 2003, or 2004 surveys (USDA 2004). Construction of the Alternative 2 group site would not impact the stream channel or bankside vegetation. Group site users may impact streamside vegetation; however, this would have minimal impact on fish habitat (i.e. similar to Diamond-Palmyra Campground) and thus on trout populations. Indirect impacts from fishing associated with the proposed group site would affect (i.e. fish would be removed) local fish, including any (if any are present) cutthroat trout here. However, as at the popular Diamond-Palmyra Campground, this would have minimal impacts on trout populations. Because Bonneville cutthroat trout are absent or essentially absent from this reach, implementation of this alternative would result in very little or no indirect impacts on individual Bonneville cutthroat trout and no direct or indirect impact to overall Bonneville cutthroat trout populations in this drainage or on the Forest.

There would be no direct effects on Columbia spotted frog and/or their habitat under this alternative. Columbia spotted frog occupy springs or riparian wetlands neither of which would be directly impacted by construction. However, the proposed site is in close proximity to wetlands presently occupied by spotted frog or suitable habitat. Although

indirect effects resulting from disturbance caused by increased human activity within adjacent habitat areas are anticipated and these impacts would be greater than any other alternative, it is believed that any indirect effects will be minimal under this alternative.

Alternative 3

Brimhall

T&E SPECIES

The Brimhall area is used by wintering bald eagles. Eagle surveys were conducted in the Diamond Fork watershed in the winters of 1999-2000 and 2003-2004. The Brimhall site had the highest concentration of eagle use of all the survey sites. Construction of a group site within this site will result in a direct impact on winter roosting habitat by removing roosting trees within the riparian corridor and floodplain. Indirect impacts from human disturbance would also occur if the campground is open for use during the winter months.

There is suitable habitat for the Western yellow-billed cuckoo at this location. There will be a direct effect from construction of the group site. Construction of the Brimhall group site would require clearing of about 1.5 acres of riparian vegetation, causing fragmentation of the habitat available for the cuckoo. The reduction of riparian habitat, however small, added to human disturbance from a 50 PAOT campsite might be enough to keep the cuckoos from ever occupying the area, rendering the habitat unsuitable.

SENSITIVE SPECIES

This site is approximately four (4) miles from the Monks Hollow adit and the Townsend's big-eared bats. Due to the distance, Brimhall group site users would not affect bats at Monks Hollow. Consequently, there will be no direct effects from construction of the group site or indirect effects from human disturbance to the bats from this alternative.

The Brimhall group site lies adjacent to lower Diamond Fork Creek. As described in the Affected Environment section, a very limited number of scattered individual remnant Bonneville cutthroats may still inhabit this stream. No cutthroat trout were observed in lower Diamond Fork Creek in 2002, 2003, or 2004 surveys (USDA 2004). Unlike with Alternative 2, construction of the Brimhall group site would impact about 1.5 acres of riparian and streambank vegetation, 0.82 acres of the floodplain, and potentially the stream channel (i.e. thru required steambank armoring). This would result in minor direct impacts on fish habitat, but because of the limited intensity and extent of the impacts would have minimal, much localized effects on trout populations. Group site users may additionally create very minor (i.e. similar to at Diamond-Palmyra Campground) impacts to streamside vegetation; however, this would have minimal localized impacts on fish habitat and thus on trout populations. Indirect impacts from fishing associated with the Brimhall group site would affect (i.e. fish would be removed) local fish including any (if any are present) cutthroat trout here. However, as with the popular Diamond-Palmyra Campground, this would have minimal impacts on trout populations. Because Bonneville cutthroat trout are absent or essentially absent from this reach, and any effects would be localized. The Brimhall group site would result in very little or no indirect

impacts on individual Bonneville cutthroat trout and no direct or indirect impact to overall Bonneville cutthroat trout populations in this drainage or on the Forest.

Columbia spotted frog and/or their habitat are not present within or adjacent to the proposed project area consequently there will be no direct effects to this species under this Alternative. The population occurs in Diamond Fork 2 to 3 miles downstream of the Brimhall site, and will not be directly affected by construction of the Brimhall group site, and is highly unlikely to be indirectly affected by recreation use of this site.

Wanrhodes

T&E SPECIES

The proposed site in Wanrhodes receives little use by wintering bald eagles. The habitat surrounding Wanrhodes Creek is adequate to support wintering bald eagle use, but they have not been observed here. The riparian forest habitat in the area will not be impacted by construction of this site. Indirect impacts from human disturbance could occur if the campground is open for use during the winter months; however, no eagles are known to use this site. Therefore, there will be no direct or indirect effects on wintering bald eagles.

Suitable habitat for the Western yellow-billed cuckoo exists at the mouth of Wanrhodes Creek at its confluence with Diamond Fork Creek. There is no suitable habitat in the proposed site which is located about 3 miles upstream of the existing suitable habitat. Therefore, construction of a group site at this location will have no direct or indirect effects to the cuckoos.

SENSITIVE SPECIES

This site is approximately three (3) miles northwest of the Monks Hollow adit. Due to the distance from the adit, Townsend's big-eared bats there would not be directly affected by construction of the group site nor indirectly affected by recreation users of this group site. There will be no direct or indirect effects to the Townsend's big-eared bat.

As described in the Affected Environment section, Bonneville cutthroat inhabit the headwaters of Wanrhodes Creek but not the lower reaches of this stream (segment extending at least 3.5 miles upstream of the Diamond Fork Road). Water temperatures and water levels in lower Wanrhodes Creek, including those in the vicinity of the proposed group site, are inadequate to support fish. Construction would not impact the stream channel or floodplain, and would impact less than 0.1 acres of riparian vegetation. Considering this, there will be no direct effects on fish. Approximately one mile of stream above the Wanrhodes Group Site location is also uninhabited by fish, and beyond that point the stream crosses private property and is not accessible to the public. Therefore, there would be no potential indirect impacts on Bonneville cutthroat trout populations from group site recreation users.

Columbia spotted frog and/or their habitat are not present within or adjacent to the proposed project area (nearest population is about 4-6 miles from this site), and

consequently there will be no direct or indirect effects to this species under this alternative.

Monks Hollow

T&E SPECIES

Surveys in 1999-2000 and 2003-2004 showed no use of this area by wintering bald eagles. There is suitable roosting habitat for the eagles to use this area. Placement of a campsite here should have no direct effect on the bald eagle. Indirect effects to wintering bald eagles could occur from human disturbance if the facility receives much winter use. This will not create a long-term detrimental effect as the eagles would return to the area once the disturbance is removed.

There is suitable habitat for the Western Yellow-billed cuckoo at this location although there are no known observations in the project area. Construction of a group site at this site would not disturb riparian habitat along Diamond Fork Creek; however, it would disturb less than 0.1 acres of riparian habitat at Red Hollow spring. Human disturbance associated with the group campsites could preclude this area from ever being used by cuckoos.

SENSITIVE SPECIES

The proposed site is within one mile of the Monks Hollow adit where Townsend's big-eared bats are located. There will be no direct impacts from construction. However, there is a potential for increased indirect impacts associated with additional people in the area which could lead to abandonment of the adits. Townsend's big-eared bats are very sensitive to human disturbance. Bat gates have been installed to prevent human occupancy of the adits to limit disturbance impacts to this species.

The Monks Hollow Group Site lies adjacent to lower Diamond Fork Creek. As described in the Affected Environment section, a very limited number of scattered individual remnant Bonneville cutthroats may still inhabit this stream. No cutthroat trout were observed in lower Diamond Fork Creek in 2002, 2003, or 2004 surveys (USDA 2004f). Construction of the proposed group site would not impact the floodplain, stream channel, or riparian or bankside vegetation along Diamond Fork Creek. Considering this, construction of the Alternative 3 Monks Hollow Group Site would result in no direct impacts on fish, including Bonneville cutthroat trout. Group site users may impact streamside vegetation; however, this would have minimal impact on fish habitat (i.e. similar to Diamond-Palmyra Campground) and thus on trout populations. Indirect impacts from fishing associated with the proposed group site would affect (i.e. fish would be removed) local fish including any (if any are present) cutthroat trout here. However, as with the popular Diamond-Palmyra Campground, this would have minimal impacts on trout populations. Considering this, implementation of this alternative would result in very little or no indirect impacts on individual Bonneville cutthroat trout and no direct or indirect impact to overall Bonneville cutthroat trout populations in this drainage or on the Forest.

Columbia spotted frog and/or their habitat are not present within or adjacent to the proposed project area (they are found several miles downstream), consequently there will be no direct or indirect effects to this species under this alternative.

Alternative 4

T&E SPECIES

Surveys in 1999-2000 and 2003-2004 showed no use of this area by wintering bald eagles. There is potential roosting habitat for the eagles to use this area. Placement of group campsites on the north side of Diamond Fork Creek and at the Monks Hollow trailhead will have no direct effects on the bald eagle. Placement on the south side of Diamond Fork Creek would have a direct effect on the eagle through removal of suitable roosting trees. Indirect effects from all site locations to wintering bald eagles could occur from human disturbance if the facilities receive much winter use. This will not create a long-term detrimental effect as the eagles are resilient and will return to the area once the disturbance is removed.

There is suitable habitat for the Western Yellow-billed cuckoo at this location although there are no known observations in the project area. Construction of group sites on the north side of Diamond Fork and at the Monks Hollow site would not disturb riparian habitat along Diamond Fork Creek; however, it would disturb less than 0.1 acres of riparian habitat at Red Hollow spring. Construction for the walk-in site on the south side of the creek will cause habitat fragmentation of suitable habitat through construction of the service road and walk-in bridge. Human disturbance associated with having group campsites on both sides of the creek would increase the chances (over Alternative 3) that this area will not ever be used by cuckoos.

SENSITIVE SPECIES

The proposed site is within one mile of the Monks Hollow adit where Townsend's big-eared bats are located. There will be no direct impacts from construction. However, there is a potential for increased indirect impacts associated with additional people in the area which could lead to abandonment of the adits. Townsend's big-eared bats are very sensitive to human disturbance. Bat gates have been installed to prevent human occupancy of the adits to limit disturbance impacts to this species.

There is currently a rough trail leading from the Monks Hollow Trailhead parking lot to the south adit. This adit was not occupied by bats, but it provides suitable habitat. Having group campsites at the trailhead increases the chances that people will hike the trail to the adit, creating a disturbance that may prevent the bats from occupying the adit.

The Monks Hollow Group Site lies adjacent to lower Diamond Fork Creek. As described in the Affected Environment section, a very limited number of scattered individual remnant Bonneville cutthroats may still inhabit this stream. No cutthroat trout were observed in lower Diamond Fork Creek in 2002, 2003, or 2004 surveys. Construction of the proposed group site would not impact the floodplain, stream channel, or riparian or

bankside vegetation along Diamond Fork Creek. Considering this, construction of the Alternative 3 Monks Hollow Group Site would result in no direct impacts on fish, including Bonneville cutthroat trout. Group site users may impact streamside vegetation; however, this would have minimal impact on fish habitat (i.e. similar to Diamond-Palmyra Campground) and thus on trout populations. Indirect impacts from fishing associated with the proposed group site would affect (i.e. fish would be removed) local fish including any (if any are present) cutthroat trout here. However, as with the popular Diamond-Palmyra Campground, this would have minimal impacts on trout populations. Considering this, implementation of this alternative would result in very little or no indirect impacts on individual Bonneville cutthroat trout and no direct or indirect impact to overall Bonneville cutthroat trout populations in this drainage or on the Forest.

Columbia spotted frog and/or their habitat are not present within or adjacent to the proposed project area (they are found several miles downstream), consequently there will be no direct or indirect effects to this species under this alternative.

MANAGEMENT INDICATOR SPECIES

Management Indicator Species (MIS) are listed in Appendix B of the 2003 Land and Resource Management Plan. Species selected as MIS are used to monitor a particular habitat type. This is accomplished by assessing the habitat conditions and population changes of the species that occupy each habitat as required in 36 CFR 219.19. Management Indicator Species for the Uinta National Forest includes beaver, Northern goshawk, Northern three-toed woodpecker, Bonneville cutthroat trout, and Colorado River cutthroat trout. The affected environment and environmental effects of the alternatives on habitats and populations of the Northern goshawk, Northern three-toed woodpecker, Bonneville cutthroat trout, and Colorado cutthroat trout are discussed in the Threatened, Endangered and Sensitive Species section of this chapter. None of the alternatives will have a direct or indirect affect on these species or their habitats. This section will only discuss the beaver.

Affected Environment

Beaver Beavers (Castor Canadensis) were widely distributed across Alaska, Canada, and the continental U.S. prior to 1800. They were trapped out quickly, however, and by the mid 1800's many beaver populations had been eliminated or dramatically reduced. Populations have become re-established throughout much of the U.S. and Canada and are increasing range-wide. The beaver is a riparian obligate species, although it inhabits a wide variety of riparian habitats as long as there is sufficient permanent water and food such as willow, aspen and cottonwood (USDA 2003).

Riparian habitats are found within the proposed project areas and throughout the Diamond Fork watershed. Diamond Fork Creek, Sixth Water Creek, an unnamed tributary to Diamond Fork and Wanrhodes Creek were surveyed in April 2002 for the presence of beaver and beaver dams. No beaver were noted within the project areas for all alternatives during the survey. The 2002 surveys of Diamond Fork Creek (from

Highway 6 to just above Springville Crossing) found 17 potentially active beaver dams within three and a half miles downstream of Springville Crossing, and five potentially active beaver dams within one-half mile upstream of Springville Crossing. In 2002, 58 dams were counted on the segment of lower Wanrhodes Creek (about 2.5-3 miles in length) above the Diamond Fork Road.

In 2004, Diamond Fork Creek and Wanrhodes Creek were again surveyed. Forty-four dams were found, 34 of which (79%) were active. In Wanrhodes, 67 dams were observed, 36 percent of which were active.

No lasting beaver dams have been found in the Diamond Fork Creek between Three Forks and Highway 6. One dam was initiated near Diamond-Palmyra Campground, but was washed out during the spring runoff and was not rebuilt. This was probably a result of the high flows or irrigation water that was released into Sixth Water Creek from the Syar Tunnel. These high flows (up to 500 cfs at highest flow) wash out the beaver dams. With the new flow regime (reduction of 500 cfs flow to 50 to 80 cfs), it is highly probable that the beaver will expand their territories to areas of suitable habitat (i.e. willow habitat) along the rest of Diamond Fork Creek.

Beaver surveys (2003) on part of the Heber Ranger District found 13 of 33 beaver dams to be active (39%) in the reaches surveyed. Ninety-two percent (92%) of the dams that were located in areas with extensive willow habitat were active, while only 5% of those located in other habitat types were active.

The 2004 beaver monitoring report covers both project level surveys, as well as the 2003 and 2004 Forest-wide MIS surveys. In these surveys, a beaver dam considered active if new mud and recently cut willows or aspen were observed. This report shows that beaver are widely distributed across the Forest and appear to be stable. The biggest threat to beaver Forest-wide is loss of aspen cover from conifer encroachment, and the loss of willow habitat.

Analysis Methods

Data utilized for this analysis includes the *Diamond Fork Area Assessment* (USDA 2000); habitat and population surveys from Forest Service field surveys. Beaver surveys were conducted in this drainage in 2002 and 2004. Assumptions are made from observation, literature review and experience.

Environmental Affects

Alternative 1

Beaver will continue to use the area as described in the existing condition. There will be no permanent habitat loss from construction of a campground. As with the other alternatives, the new flow regime in Diamond Fork Creek will allow for potential beaver re-establishment in Diamond Fork Creek. Without the high annual flows, beaver may eventually re-colonize areas that for many years washed out in the high flows.

There will be potential for habitat loss from continuing impacts from recreation users. This includes existing uncontrolled dispersed group recreational activities within the riparian corridor and fisherman access points that lay between the Diamond Fork Creek and Diamond Fork Road, around Monks Hollow, and in the Wanrhodes area.

Alternative 2

There will be no direct impacts to beaver from this alternative. The closest area with beaver activity exists in Wanrhodes, approximately 3 miles northeast of the site. However, with the new flow regime there will be more opportunities for beaver to relocate in the lower reaches of Diamond Fork Creek. Without the high annual flows, beaver may re-colonize areas and build dams in areas that for many years washed out in the high flows. Indirect effects include disturbance from fisherman and campers due to the easy access to the Diamond Fork Creek from this site.

Alternative 3

Brimhall

No beaver or their dams have been cited in this area. The closest area with beaver activity exists in Wanrhodes, approximately 2 miles northeast of the site. With the new flow regime in Diamond Fork Creek, there will be more opportunities for beaver to relocate in this stream. Without the high annual flows, beaver may eventually re-colonize areas, including this reach of Diamond Fork Creek which for many years washed out in the high flows. It is anticipated that construction of a campground at this site would have little if any impact on potential beaver expansion.

Wanrhodes

This area is located in a small flat on Wanrhodes Creek. The area has already been impacted by dispersed camping, causing compaction of the site, and loss of vegetation. This is an upland site composed of mostly sagebrush. There is a steep drop-off to the creek, which is primarily composed of cottonwoods.

There are numerous beaver and beaver dams approximately 2 miles downstream from this site. Little beaver activity has been noted in the immediate area, probably due to the low water flow in the headwaters. There should be no effects to beaver from this site.

Monks Hollow

No beaver dams were found within this area during the 2002 or 2004 surveys. The closest beaver activity occurs approximately 5 miles upstream of this site. Without the high annual flows, beaver may eventually re-colonize areas, including this reach of Diamond Fork Creek, which for many years washed out in the high flows. Some of the stream channel at this site is highly incised, and beaver will not be able to construct dams at these locations. It is anticipated that construction of a campground at this site would have little if any direct impact on potential beaver expansion. There would be some indirect impacts to the beaver through human disturbances from noise and people accessing the creek at that location.

Alternative 4
No beaver dams were found within this area during the 2002 or 2004 surveys. The closest beaver activity occurs approximately 5 miles upstream of this site. Without the high annual flows, beaver may eventually re-colonize areas, including this reach of Diamond Fork Creek, which for many years washed out in the high flows. Some of the stream channel at this site is highly incised, and beaver will not be able to construct dams at these locations. It is anticipated that construction of a campground at this site would have little if any direct impact on potential beaver expansion. Having all 475 PAOTs at this location could increase indirect impacts to the beaver through human disturbances from noise and people accessing the creek at that location.

None of the action alternatives will contribute to a downward trend of beaver populations on the Uinta National Forest.

NEOTROPICAL MIGRATORY BIRDS

Affected Environment
While an emphasis is placed on riparian area protection for neo-tropical migratory birds, almost all bird species that could be found in Utah are considered neo-tropical migratory birds. They occupy a wide range of habitat types. The Utah Ornithological Society lists 425 species of birds in the *Field Checklist of the Birds of Utah* (2004). Of those 425 species, only 20 are not considered neo-tropical (USDI 2004). Consequently, all habitat types have the potential to have a neo-tropical bird associated with it. Riparian habitats are particularly vulnerable. The lower portion of the riparian area in Diamond Fork has lost as much as 90% or the riparian forest from the 1920s to the present (Diamond Fork Area Assessment 2000).

Five (5) neo-tropical migratory bird monitoring sites are located within the Diamond Fork watershed. Eighty-one (81) species of neo-tropical migratory birds have been found during neo-tropical migratory bird surveys in years from 1994 to 2004.
Survey dates and number of species identified are shown in the following table.

ROUTE NAME	SURVEY DATE	NUMBER OF SPECIES
Billie's Mountain #2	06/01/1994	41
	06/02/2000	30
Ray's Valley #1	05/16/1994	24
	06/09/2000	31
	07/01/2004	31
Two Tom Hill	06/29/1994	25
	06/30/2000	27
	06/30/2004	35
Lower Diamond Fork Ck.	06/16/1999	44
	07/16/2002	38
	07/09/2004	44

Upper Diamond Fork Ck. [1/]	07/09/2004	34

[1/] This route was established in 2004.

Bird species identified at all sites and associated with riparian habitats include the Northern flicker, dusky flycatcher, Cordilleran flycatcher, black-capped chickadee, house wren, American robin, black-headed grosbeak, rufous-sided towhee, and the chipping sparrow (USDA 2004e). The broad-tailed hummingbird, a Utah Partners in Flight Avian Conservation Strategy's Priority species associated with riparian areas (Parrish et al 2002) was identified in 4 of the 5 survey routes.

Environmental Effects

Analysis Methods

Data utilized for this analysis includes habitat and population surveys from the Utah Division of Wildlife Resources; and Forest Service field surveys. Neo-tropical migratory bird species monitoring surveys were conducted during 1994, 1999, 2000, 2002, and 2004. Breeding bird surveys were conducted in nearby Sheep Creek in 1991-2004. Assumptions are made from observation, literature review and experience.

Alternative 1

Under the No Action Alternative the group-site campground would not be constructed and there would be no direct impacts from construction activities. Neo-tropical migratory birds will continue to use the watershed as it currently exists. There will be no permanent habitat loss from construction of a campground. There will be potential for direct impacts on habitat due to increased loss of riparian habitat from dispersed group recreational activities within the riparian corridor that lies between the Diamond Fork Creek and Diamond Fork Road, around Monks Hollow, and in the Wanrhodes area. Indirect impacts human disturbances will increase as more demand is put upon the watershed from people seeking recreational activities

Alternative 2

Construction of the campground would remove brush that many neo-tropical migratory birds, such as the green-tailed towhee and the brewer's sparrow, depend on during their nesting season. There will be a direct loss of nesting and foraging habitat. There will be a temporary loss of habitat in the total construction area footprint (approximately 25 acres). The area actually occupied by facilities will result in a loss of approximately 6 acres of habitat. There will be a very minor (< 0.1 acre) direct loss of nesting/foraging habitat to birds that rely on the riparian habitat. Construction of the campground during the nesting season could result in a direct loss of individuals unless construction is timed to begin after the birds have fledged in mid to late July.

Human disturbance associated with campground use and recreational activities could have long-term indirect effect on the birds leading to nest abandonment and less recruitment into the area.

Alternative 3

Brimhall

Construction of the campground would remove brush that many neo-tropical migratory birds depend on during their nesting season. There will be a direct loss of nesting and foraging habitat. There will be a temporary loss of habitat in the total construction area footprint (approximately 3.07 acres). The area actually occupied by facilities will create an approximate 1.5 acres of permanent loss. There will be a minor (about 0.44 acres) direct loss of nesting/foraging habitat to birds that rely on the riparian habitat. Construction of the campground during the nesting season could result in a direct loss of individuals unless construction is timed to begin after the birds have fledged in mid to late July.

Indirect effects from increased human presence would be similar to those described for Alternative 2.

Wanrhodes

There would be direct impacts to neo-tropical migratory birds at this location through the loss of nesting and foraging habitat on about 1.7 acres of uplands that would be occupied by facilities. There would be less effect to riparian species as the riparian habitat surrounding Wanrhodes Creek is much smaller than the riparian area associated with Diamond Fork Creek. Impacts on riparian habitats would be less than 0.1 acres. The area surrounding the creek is already heavily impacted by dispersed camping. Indirect effects to the birds would be of similar type as described for Alternative 2.

Monks Hollow

There would be minimal direct impacts to neo-tropical migratory birds at this location. This area was used as hub for the activities associated with the construction of the Diamond Fork Pipeline. The area has been cleared of vegetation, and for a number of years was home to trailers, heavy equipment, pipes and other materials. Prior to construction of Diamond Fork Pipeline, the area was heavily used for dispersed recreational use, was bisected by many unclassified roads and many areas were devoid of vegetation. Construction of a campground at this site would limit restoration to only those areas not directly occupied by facilities. Indirect effects to the birds would be similar in type as described for Alternative 2.

Alternative 4

There would be more direct impacts to neo-tropical migratory birds under this alternative. Even though this area was used as a hub for the activities associated with the construction of the Diamond Fork Pipeline, this alternative does not restrict itself to keeping the construction within the previously disturbed area. More riparian habitat is removed with this alternative due to the construction of a walk-in group site on the south side of the creek (less than 0.5 acres). This will directly affect the neo-tropical migrants through additional removal of available habitat, and habitat fragmentation.

Indirect effects to the birds would be similar in type as described for Alternative 2. This alternative stretches the campground out over a larger area and occupies both sides of the creek. This spreads any human disturbance over a larger area.

Mitigation Measures
Construction of the campground during the nesting season could result in a direct loss of individuals unless construction is timed to begin before the birds are nesting (April) until after the birds have fledged (mid to late July). Removal of riparian forest vegetation will be minimized.

SPECIES OF CONCERN

Leatherside Chub

The leatherside chub is listed as a species of special concern by the State of Utah due to substantial decrease in population levels (UDWR 1997). It is a small minnow, native to Utah, Idaho, and Wyoming. The declining population levels are attributed to non-native fish introductions and habitat alterations**.**

The leatherside chub is found in lower Diamond Fork and the lower sections Fifth Water and Sixth Water Creeks (Mitigation Commission and U.S. Forest Service 2000). Leatherside chub show a habitat shift in the presence of Brown Trout (Belk, Olsen, and Nannini, 2000), occupying slow velocity, off channel habitats, such as backwater or side channels. Lower Diamond Fork contains Brown Trout, an introduced predator.

The most extensive leatherside chub survey in Diamond Fork was conducted in October and November, 1996 and reported to the US Forest Service by Walser et al., 1997. Leatherside chub was the most common minnow found in Diamond Fork in the sections between Highway 6 and the old proposed Monks Hollow dam site. Walser, et al., reported that within the lower Diamond Fork reach, leatherside chub were most commonly found downstream of Brimhall Canyon, where braided channels and backwater habitat were abundant. They were less common in the channelized, upstream sections. The occupied habitat consisted of backwaters and cutoff pools, with water depths less than 1 foot and with abundant vegetative cover (Walser et al., 1997).

Golden Eagle
Golden eagles are known to nest in close proximity of Diamond Fork Creek. Golden eagles have been studied from February 1996 through June 2002 (Keller, 2002). Six Golden Eagle territories have been defined in Diamond Fork Canyon. Three of the known territories are located near potential alternative campground sites. The three territories are Lower Diamond Fork, West of Brimhall Canyon, and Red Mountain South.

Alternative 1
Under the No Action Alternative the group-site campground would not be constructed and there would be no direct or indirect impacts. Both species will continue to use the

area as it currently exists. There will be no permanent habitat loss. There will be potential for increased loss of riparian habitat from dispersed group recreational activities within the riparian corridor that lies between the Diamond Fork Creek and Diamond Fork Road around Monks Hollow and also in the Wanrhodes area.

Alternative 2

There would be no direct effects on leatherside chub (Gilia copei) or their habitat under this Alternative. Leatherside chub typically occupy either main channel habitats (pools and riffles) or, in the presence of predators (brown trout), off channel backwater habitats neither of which would be directly impacted by construction. The proposed site under this alternative is adjacent to braided channels and backwater habitat areas where leatherside chub are most commonly found. Because of this, indirect effects resulting from disturbance caused by increased human activity within adjacent habitat areas are anticipated. However, it is believed that these indirect effects will be minimal under this alternative.

The Lower Diamond Fork territory has been observed from 1996 through 2002 (Keller, 2002) and is located less than 1 mile from the proposed site. The golden eagle nest has been active and fledged young every year. The nest sites are located in areas that would not receive disturbance during campground construction.

Alternative 3

Brimhall

Leatherside chub have not been found at the Brimhall locations (Mitigation Commission and U.S. Forest Service 2000) and braided channels and backwater habitat where leatherside chub are most commonly found are not common in this area consequently there will be no direct or indirect effects to this species under this Alternative.

The West of Brimhall Canyon territory has been observed from 1996 through 2002 (Keller, 2002) for golden eagles. The golden eagle nest has been active every year and have fledged young approximately half of the time. The nest sites are located in areas that would not receive disturbance during campground construction. Furthermore, the location of the nest site is such that there should be no disturbance from additional people camping in this area.

Wanrhodes

Leatherside chub have not been reported as present in Wanrhodes Creek (Mitigation Commission and U.S. Forest Service 2000) and braided channels and backwater habitat where leatherside chub are most commonly found when brown trout are also present are not common in this area. Consequently there will be no direct or indirect effects to this species under this alternative.

There are no known golden eagle nesting sites in Wanrhodes and no impacts to golden eagles would occur at this location.

Monks Hollow
Leatherside chub have not been found at the Monks Hollow location (Mitigation Commission and U.S. Forest Service 2000). Braided channels and backwater habitat where leatherside chub are most commonly found when brown trout are also present are not common in this reach. There would be no direct impacts on leatherside chub habitat and minimal indirect impacts from campground users.

The Red Mountain South golden eagles territory, the closest territory to the preferred alternative, has not been occupied since 2000 (Keller, 2002). This territory has not had a successful fledgling since 1997. A chick was hatched in mid-April and fledged by late-June of that year. If the project area becomes repopulated by golden eagles, the hatch and fledging would be over before most of the recreation use occurs.

Alternative 4
Leatherside chub have not been found at the Monks Hollow location (Mitigation Commission and U.S. Forest Service 2000). Braided channels and backwater habitat where leatherside chub are most commonly found when brown trout are also present are not common in this reach. There would be no direct impacts on leatherside chub habitat and minimal indirect impacts from campground users.

The Red Mountain South golden eagles territory, the closest territory to the preferred alternative, has not been occupied since 2000 (Keller, 2002). This territory has not had a successful fledgling since 1997. A chick was hatched in mid-April and fledged by late-June of that year. If the project area becomes repopulated by golden eagles, the hatch and fledging would be over before most of the recreation use occurs.

CUP WILDLIFE MITIGATION

Affected Environment
The construction and operation of the Central Utah Project has impacted, among other things, big game habitat. To partially mitigate for these impacts, lands with high big game habitat value have been acquired and are managed for the benefit of big game species. Several of these mitigation parcels are located in Diamond Fork and are shown on the attached Figure 3-1 CUP Wildlife Mitigation Lands.

Lower Diamond Fork Mitigation Lands The Lower Diamond Fork Mitigation Lands consist of approximately 168 acres at the mouth of Diamond Fork Creek. The properties were acquired by the Bureau of Reclamation for Wildlife and Angler Access purposes. The lands are managed by the Forest Service in accordance with the Childs Property Operating Agreement.

Redford Mitigation Lands The Forest Service acquired approximately 1,152 acres of Land in 1984 by exchange and donation. Approximately 617 acres on the north side of Diamond Fork road are credited for CUP wildlife mitigation. These lands are to be

managed for the benefit of wildlife in accordance with the 2003 Land and Resource Management Plan. The primary management objective of this property is to provide deer winter range. The adjacent 535 acres on the south side of the road, including the riparian corridor, provide a buffer between the 617 acre mitigation parcel and the remaining private lands to the south that were anticipated to be developed into ranchettes. These lands are also managed for dispersed recreation or wildlife emphasis, and winter range protection under the 2003 Land and Resource Management Plan.

Red Hollow (Diamond Properties) The Bureau of Reclamation acquired approximately 640 acres in Red Hollow as CUP wildlife mitigation. The lands were transferred to the Forest Service in 1991 and are managed with a wildlife emphasis in accordance with the *Red Hollow Resource Management Plan* and 2003 Land and Resource Management Plan

Alternative 1
There would be no impacts to CUP wildlife mitigation lands under the no action alternative.

Alternative 2
The proposed site would be constructed adjacent to the 617 acre Redford Mitigation parcel and within the 535 acre parcel intended to be a buffer between the mitigation parcel and remaining private lands to the south. There may be indirect impacts to wildlife on these parcels with increased human presence in the area. The 617 acre parcel provides winter range for mule deer. Mule deer use on the parcel would occur primarily in the winter months when the group-site campground is closed. Therefore indirect impacts would be minimal.

Alternative 3
Brimhall
There would be no impacts to CUP mitigation lands at the Brimhall site.

Wanrhodes
There would be no impacts to CUP mitigation lands at the Wanrhodes site.

Monks Hollow
The extreme south end of the Red Hollow Mitigation parcel is about 1 mile from the proposed group-site campground. The water source for the group-site campground is within 0.25 miles of the extreme south end of the mitigation parcel. The primary goal for the Red Hollow Mitigation property is to provide habitat for winter elk use. Secondary objectives are to provide habitat for non-winter deer, grouse and other non-game species. Indirect impacts from increased visitor use would likely increase although public use during the critical winter months would not be as frequent as other times of the year. In addition, there is presently a locked gate at the south boundary of the mitigation parcel. Public use would be limited to foot traffic further minimizing indirect impacts on wildlife.

Alternative 4
Same as described for Monks Hollow under Alternative 3 except proportionally higher with an increased campground capacity at one location.

RECREATION

Affected Environment
There are a number of recreation activities and developments that occur in Diamond Fork and this accounts for the majority of the area's human activity. Overall recreation use has been increasing in Diamond Fork at a rate greater than 15 percent per year. Diamond Fork had an estimated 600,000 recreation visitor days (RVD) in 1995 (2000 Diamond Fork Area Assessment). When the old Diamond/Palmyra Campground was replaced by the new Diamond Campground, 330 PAOT's of group camping was lost. This proposal is intended to replace those lost 330 PAOT's as well as add 145 additional PAOT's to provide for the increasing recreation demand. Providing additional camping opportunities was included in the Decision Notice for the 1990 Final Environmental Impact Statement for the Diamond Fork System (refer to Chapter 1).

Environmental Effects
Alternative 1
This alternative would not provide the additional camping identified in the purpose and need statement. The 330 PAOT's lost in the Diamond Campground would not be replaced. The increasing demand for recreational group camping opportunities in Diamond Fork would not be met and there would continue to be an outstanding responsibility to construct a group-site campground in the Diamond Fork watershed.

Alternative 2
This Alternative would meet the purpose and need for this project with the construction of 475 PAOT and would complete the commitments to construct developed camping opportunities in Diamond Fork. This site would also be the closest location to the population base along the Wasatch Front.

Alternative 3
This Alternative would meet the purpose and need for this project with the construction of 475 PAOT and would complete the commitments to construct developed camping opportunities in Diamond Fork. Road widening and grading would need to be completed to access the Wanrhodes site if it is selected as part of the alternative. Some historical dispersed camping sites in Wanrhodes would be converted to developed group sites.

Alternative 4
This Alternative would meet the purpose and need for this project with the construction of 475 PAOT and would complete the commitments to construct developed camping opportunities in Diamond Fork. While part of this proposal is located at the Monks Hollow Trailhead implementation is not contingent upon the outcome of the Monks Hollow/Teat Mountain trail connector proposal, currently being analyzed.

HERITAGE RESOURCES

Affected Environment

Diamond Fork has been used by American Indians as a hunting and plant gathering area, and as a travel route between Utah and Strawberry Valleys, for at least 8,000 years. The area was also an important refuge for some Ute Indian families during periods of conflict with European settlers (c. 1850-1865) and during the early Reservation Era (c. 1865-1910). However, few intact archaeological sites remain from these activities. As European American settlement of Utah Valley intensified during the 1880's, people there began to look to Diamond Fork as a source of additional timber, grazing land, homesteading land, and water. As a result, there are a large number of European American archaeological sites in the area, including campsites, corrals, and features associated with development of the Strawberry Valley Project.

The majority of historic sites are related to homesteading, which is one of the most important historic themes in Diamond Fork. The area was homesteaded starting in the 1880's, when dozens of families developed small farms in the canyon. However, few of these homesteads remain intact. The development of highways and water delivery systems, weathering, and other management activities have left few of these original homesteads in good enough condition to provide a visual and/or archaeological record of this aspect of early canyon history.

All proposed group site areas included in the Alternatives were inventoried for archaeological or historical sites during 2000. The proposed water collection and delivery system for the Monk's Hollow group-site is located in lower Red Hollow. This area was inventoried in 1999 as part of planning for a prescribed burning project. Three European American homesteading sites which are eligible for the National Register of Historic Places might be directly or indirectly affected by the proposed alternatives, and are described below.

No American Indian sites were found within or near any of the proposed group sites. This may be due, in part, to the fact that all of these locations (except the mouth of Brimhall) were used as agricultural fields by European American settlers. Clearing the fields of stone and repeated plowing may have obliterated archaeological evidence of ancient campsites. Overall, densities of ancient and historic American Indian archaeological sites are generally low in the Diamond Fork drainage.

Environmental Effects

Alternative 1

No sites would be affected, either directly or indirectly, if no group-sites are constructed.

Alternative 2

The proposed group-site location has only one archaeological or historical site, which is the remains of a European American homestead that is Not Eligible for the National

Register. There are no other sites in the area that might be indirectly affected by increased use of this part of the canyon. As a result, this alternative would not affect significant (National Register Eligible) sites in any way.

Alternative 3

Brimhall and Wanrhodes

There are no sites within the proposed Wanrhodes group-site location. However, there is a National Register Eligible European American homestead in the upper portion of Wanrhodes Canyon that might be indirectly impacted by increased use of the canyon. These indirect effects might include illegal artifact collection and/or trampling of features through increased visitation. There are also no cultural resources on the proposed unit at the mouth of Brimhall; however, there is another National Register Eligible homestead near it that might be indirectly affected by visitors.

Monks Hollow

There is a single archaeological site located along the margins of the proposed Monks Hollow site on the South side of Diamond Fork Creek. It is a National Register Eligible homestead cabin that was occupied between 1920 and 1938. This site could be indirectly impacted by increased site trampling and/or illegal artifact collecting resulting from an increased human presence in the area.

Mitigation

Any indirect effects to the homestead cabin would be mitigated by construction of a fence around the site, signing that includes site protection messages, and site monitoring.

Alternative 4

The 75 PAOT walk-in site proposed under this alternative is adjacent to the National Register Eligible homestead cabin. There is a greater probability under this alternative that this site would be impacted by increased site trampling and/or illegal artifact collecting.

Mitigation

Adverse effects to the homestead near the Monks Hollow proposed group-site would be mitigated through implementation of a Memorandum of Agreement (MOA) with the Utah State Historical Preservation Office. Specific mitigation measures include interpretation of Diamond Fork's homesteading history using signs at the group-site, and site protection (fencing). Any indirect impacts to the homestead site would be mitigated through the same measures outlined in the MOA.

VEGETATION AND NOXIOUS WEEDS

(Note riparian vegetation has been addressed separately as described previously in this Chapter under Issue 2.)

<u>Affected Environment</u>

The sites included in the four alternatives are in the outer fringes of riparian zones or in

adjacent upland communities.

The riparian zones in the project area are dominated by narrowleaf cottonwood *(Populus angustifolia)*. Coyote willow *(Salix exigua)* is the most common shrub, with lesser amounts of other willows, red-osier dogwood *(Cornus sericea)*, western birch *(Betula occidentalis)* and skunkbush *(Rhus aromatica var. trilobata)*. The herbaceous layer is dominated by non-native grasses like redtop (*Agrostis stolonifera)*, Kentucky bluegrass *(Poa pratensis)* and smooth brome *(Bromus inermis)*.

Vegetative communities immediately adjacent to the riparian zone are typically dominated by sagebrush, and less often by juniper *(Juniperus osteosperma)* or Gamble Oak *(Quercus gambelii)*. Mountain big sagebrush *(Artemisia tridentata var. vaseyana)* is the most common sagebrush species in the canyon, but some remnant patches of Basin big sagebrush *(Artemisia tridentata var. tridentata)* remain in the bottomlands. Some upland sites have been altered by conversion to hay fields, pastures or rangeland seeded with grasses, particularly smooth brome and crested wheatgrass *(Agropyron cristatum)*. Beyond the bottomlands and lower slopes, oakbrush dominates the landscape in lower Diamond Fork Canyon. Pinyon pine *(Pinus edulis)* and juniper dominate on some steep south-facing slopes, particularly on shale soils. There are no farmlands in the project area.

In riparian areas, the primary weeds of concern in lower Diamond Fork are Canada thistle, tamarisk and perennial pepperweed. Canada thistle is well established in the canyon and expanding in portions of it. It forms dense to sparse patches in and adjacent to riparian areas, and may be increasing in density as a result of recent drought conditions. Tamarisk is common along the lower Spanish Fork River and is beginning to establish from the mouth of Diamond Fork Canyon up to about Three Forks, with many seedlings in the lower reaches. Perennial pepperweed is also prevalent along Spanish Fork River, but has only been found in the lowermost areas of Diamond Fork Canyon, primarily within the first 1 mile. It is difficult to treat these weeds because of their occurrence near live water, which limits the methods authorized to treat weeds.

Musk thistle (*Carduus nutans*) is the most common noxious weed in the Diamond Fork drainage uplands. It has formed large, dense patches in the lower canyon, especially in the old agricultural fields along the creek bottom. Concentrated treatment efforts by the Forest Service and Utah County over the last five to ten years have greatly reduced its abundance in the road corridor and along bottomlands adjacent to the main stem of Diamond Fork Creek. Whitetop (*Cardaria draba*) is found in scattered infestations along roads and at dispersed campsites throughout the drainage. It has recently expanded in areas disturbed during construction of the CUP pipeline. Jointed goat grass (*Aegilops cylindrica*) is also present along the main Diamond Fork road and in the old agricultural fields, and appears to be expanding. Field bindweed (*Convovulus arvensis L.*) occurs in the old fields as well. Several other species have been found within the Highway 6 corridor, but have not yet become established in the lower Diamond Fork drainage, including Russian knapweed (*Centaurea repens*), squarrose knapweed (*Centaurea*

squarrosa) and Scotch thistle *(Onopordum acanthium)*. A patch of dyer's woad (*Isatis tinctoria*), approximately 50 acres in size, occurs near Sterling Hollow in Spanish Fork Canyon.

Cheatgrass (*Bromus tectorum*), although not designated in Utah as "noxious", is an invasive exotic plant species that has dramatically impacted drier sites in the lower canyon, and has the potential to expand into all upland acres in the watershed. It has expanded across steep, dry lower-elevation slopes, often where fires have burned. The early-drying litter cheatgrass facilitates unnaturally high fire frequency, putting sagebrush at risk. Blue spurge (*Euphorbia myrsinites*) has been found in very small numbers at two sites in the lower canyon. It is an ornamental species which has escaped at many sites along the foothills of the Wasatch Front and has formed extensive patches. Bulbous bluegrass *(Poa bulbosa)* and Japanese brome *(Bromus japonicus)* are also commonly found in the project areas.

Environmental Effects

Alternative 1

Under the No Action alternative, no group-site facilities would be constructed and there would be no direct impacts or indirect effects to vegetation from construction activities. There would be no potential for invasion or spread of noxious weeds through project-related activities.

Alternative 2

The proposed site for Alternative 2 is an old floodplain which was converted to agricultural fields early in the century. With the downcutting of Diamond Fork Creek most of the site ranges from 5 to 10 feet above the water table and only supports upland vegetation. The site is located between the road and Diamond Fork Creek, and slopes gently from the road to the creek in a series of terraces above the current wet floodplain. A historic irrigation system exists on the property and reports and records suggest the site was used primarily for alfalfa (*Medicago sativa*) hay production. Sometime during the last 30 years the site was planted to perennial grasses and now is dominated by smooth brome, which forms a stand across much of the area. A single clump of box elder (*Acer negundo*) trees remains on the knoll in the mouth of Lavanger Hollow, and some Basin big sagebrush is found along the fenceline adjacent to the road and in a few other scattered spots. A riparian zone extends about 100 feet into the site through a culvert in the Diamond Fork road before disappearing in the highest terrace. It supports a few willows and young cottonwoods.

In 1997, the Central Utah Water Conservancy District completed construction on the Diamond Fork Pipeline bisecting the proposed site. A swathe approximately 150 feet wide along the centerline of the pipeline was disturbed. The disturbed area was drilled and seeded with a mixture of mostly native grasses, forbs, and shrubs. Establishment has been variable with ground cover approaching 25 percent on some sites. The new plant community is currently dominated by perennial wheatgrasses, with Great Basin wild rye *(Elymus cinereus)* beginning to rapidly increase in density.

The site is approximately 25 acres in size, of which the facilities proposed for construction would occupy approximately 6 acres. It is unlikely that the entire 25 acres would be disturbed, so that some islands of vegetation would remain between hardened surfaces. Because there are no shrubs or trees on the site, it is planned that many would be planted to provide shade.

Because noxious weeds are present on the site, their populations are expected to expand into areas disturbed by construction unless preventive actions are taken. Specified mitigation measures include such actions which are described in Chapter 2.

Constructing a campground on this site would greatly increase the occupancy of humans in the adjacent riparian area along Diamond Fork Creek. The public will likely largely stay on new and existing trails in this zone but will also inevitably develop foot paths, especially paralleling the creek. Indirect impacts to riparian vegetation would be localized. Mitigation measures of designating trails and signing are planned.

Alternative 3

Brimhall

The areas proposed for development at the mouth of Brimhall Canyon encompasses about 3 acres and is adjacent to riparian plant communities along both sides of Diamond Fork Creek. The lower fringes of the area are riparian, with several clumps of cottonwood on the upper edges of the riparian area, occasional birches, and willow and forb/grass communities immediately adjacent to the creek. The site on the south side of the creek is fairly level and sits several feet above the current stream level on an old floodplain terrace. It is occupied primarily by seeded upland grasses, grading into sagebrush-grass. There are some pockets of willow on this surface, and a large birch tree, presumably supported by subsurface water.

The site on the north side of Diamond Fork Creek includes a floodplain surface that is only sparsely vegetated, due to impacts from past parking and dispersed camping. The area has been closed to the public for about three years but the vegetation has not fully recovered, likely due to compacted soils and a loss of native seed source. The area is bissected by a small intermittent drainage entering from the north and the access road extending from the main road. The flat floodplain surfaces grade quickly into steeper sagebrush-grass slopes. Cottonwoods and willows grow along the creek.

Of the approximately 3 acres of this site, about 1.5 acres would have facilities constructed on them. The wetter portions of the riparian area would not be directly impacted by construction activities. A patch of willows and other facultative wetland shrubs occur at the mouth of Brimhall Canyon on an old flood surface surrounded by upland vegetation. This patch is likely supported by subsurface flows and could be impacted by construction unless efforts are made to avoid the area. Construction would be done mostly in sagebrush-grass, grass and drier riparian communities.

The facilities would be constructed at the outer fringes of the cottonwoods and the adjacent upland communities. This would minimize direct effects to cottonwoods and riparian vegetation. Cottonwood forests throughout the lower drainage are typically of older trees with little regeneration. However, any hardened surfaces within the cottonwoods would restrict some opportunities for regeneration from suckers compared to the No Action Alternative, as would other activities associated with heavy human use adjacent to hardened sites (e.g. trampling, illegal wood cutting). Mature trees on this site may continue to provide shade for another few decades, but with limited regeneration a net loss of cottonwoods can be expected over several decades within the campground. The vegetation management strategy would need to plan and monitor for protection of new cottonwood recruitment.

Wanrhodes
The area proposed for development is located on a small flat adjacent to the road, which drops steeply to the creek on the west side. The flat would likely be occupied naturally by mountain big sagebrush, but has been seeded in the past to smooth brome and has also been heavily impacted by dispersed camping resulting in areas of bare ground and compaction. This is predominantly an upland site, with cottonwoods and other riparian vegetation limited to the streambanks below the designated site.

Of the approximately 10 acres involved in this site, about two acres of upland vegetation would be impacted by construction of facilities. The narrow forest gallery along Wanrhodes Creek would not be impacted by construction; facilities would be located adjacent to the road, well above the entrenched stream channel. No riparian vegetation would receive direct impacts, although indirect impacts could develop through time. A certain amount of trampling would occur and trails would develop from campground users. Recreation related woodcutting in the cottonwoods could have negative effects on tree health and could reduce regeneration, which appears to already be insufficient to perpetuate these stands. This would need to be addressed in the vegetation management strategy.

Monks Hollow
This site extends along the north side of Diamond Fork Creek, from the mouth of Monks Hollow upstream for approximately one mile. Cottonwood and willow line the creek throughout much of this stream section, with cottonwoods extending onto higher, older flood surfaces. On these higher surfaces, a midstory of skunkbrush (*Rhus trilobata*), Wood's rose (*Rosa Woodsii*) and hawthorn (*Crataegus douglasii*), is common, which grades into sagebrush communities (Basin big sagebrush and mountain big sagebrush) and scattered Rocky Mountain juniper (*Juniperus scopulorum*).

At Monks Hollow, at the downstream end of the site, vegetation has been impacted by development of trailhead parking and by illegal off-road use radiating from there. There is remnant Basin big sagebrush on the site, suggesting it was the dominant species prior to disturbance, perhaps along with Basin wild rye. Much of the approximately 14-acre area proposed for campground development includes substantial bare ground with some

compaction. The upstream end of the Monks Hollow site includes the spoil stockpiles resulting from drilling of the Upper Diamond Fork Tunnel and Pipeline. The native vegetation was removed and new topography created with about seven feet of rock spoil. The site has been re-contoured, covered with topsoil and planted to native vegetation as part of the site rehabilitation. Adjacent riparian vegetation was not greatly impacted by the tunnel and pipeline construction. Between the trailhead and spoil area, along the north side of the creek, lays a heavily used dispersed camping area. Deeply rutted and compacted roads dissect the area. Foot-traffic has resulted in removal of most of the remaining understory vegetation; scattered large shrubs are often all that remains under the cottonwood understory. Mature trees show damage from human activities. Cottonwood regeneration has likely been reduced because of heavy dispersed camping use along the north side of the creek.

Under this alternative construction would primarily be focused on the area impacted by the construction of the Upper Diamond Fork Tunnel and Pipeline. Other portions of the site would remain relatively unimpacted. The campground would occupy about 3 acres and direct construction effects to riparian vegetation would be very limited in acreage, about 0.1 acres. Indirect impacts to riparian vegetation would develop over time from foot traffic originating in the campsites and from wood gathering and cutting. Cottonwoods at this site are generally mature and many have been damaged by campers.

Alternative 4

Under this alternative, construction of all 475 PAOT would be constructed at this site, on both the north and south sides of Diamond Fork Creek. This proposed site involves about 20 acres, on which about 7 acres would have facilities constructed. Effects to vegetation would be similar to those described above for the Monks Hollow site, except that development would be more concentrated with construction of all 475 PAOT at this single location. The riparian vegetation and upland vegetation on the south side of Diamond Fork Creek are essentially the same as on the north side. Differences involve a greater percentage of non-native grasses on the south side terrace, mostly smooth brome and bulb bluegrass, and a spring and very small Agrostis/Juncus/forbs wetland (about 0.1 acre combining slope and terrace) on the far eastern side of the terrace, outside the formal boundary of the campground. Vegetation along the south side of the creek has been much less impacted by recreational activities, although some OHV trailing is noticeable.

Effects to vegetation would be similar to those described above for the Monks Hollow site, except that development would areas also include the 75 PAOT walk-in site on the south side of the stream and the three 25 PAOT sites at the trailhead of Monks Hollow. Construction would be outside the riparian area and active floodplain with the exception of a new footbridge across the creek and a small portion of the administrative access road. Approximately 0.1 acres associated with the footbridge and 0.34 acres associated with the access road would be constructed in the riparian area.

Indirect effects to riparian vegetation would be similar to Alternative 3, but would involve both sides of the creek, and also the small wetland outside the campground zone,

which is within easy walking distance and would be very attractive to playing children. This wetland already receives moderate to heavy trampling from limited livestock presence, so the potential exists for complete destruction of the wetland vegetation both on the slope and the terrace if sustained human trampling also occurs. Protection efforts are being mandated as part of this alternative, which include fencing and interpretive signs for both slope and terrace wetland portions. Fencing would effectively exclude the cattle. Typical Forest Service built fencing is unlikely to completely exclude humans, but would likely reduce their impacts to acceptable levels.

AIR QUALITY

Affected Environment

Ambient air quality is regulated by provisions under the Federal Clean Air Act of 1970. Two air quality standards established by the U.S. Environmental Protection Agency are applicable to the project area. The National Ambient Air Quality Standards (NAAQS) and Prevention of Significant Deterioration (PSD).

Environmental Effects

All Alternatives

Based on an average occupancy of three people per vehicle, full capacity of 475 PAOT would result in an additional volume of approximately 158 vehicles. Total emissions would not result in exceedance of NAAQS and PSD standards.

ROADLESS/WILDERNESS

Affected Environment

Approximately 554,850 acres, or 62 percent, of the Forest meet the definition of roadless area as defined in the Forest Service Handbook. Approximately 58,000 acres, or 6 percent, of the Uinta National Forest has been placed in the National Wilderness Preservation System.

Environmental Effects

All Alternatives

None of the alternatives would effect Roadless or Wilderness Areas.

CATTLE GRAZING

Affected Environment

Alternative 3 and Alternative 4 are located within the Diamond Fork Grazing Allotment. The allotment is permitted for 2,141 cow/calf pairs from about June 11 to October 15. It is managed with a three-pasture rest rotation grazing system.

Alternative 2 is located approximately one and one/half miles southwest of the allotment. Cattle trail down the Diamond Fork Road, past the proposed site in the fall as they are coming off the Forest.

Environmental Effects

Alternative 1
This alternative would have no effect on grazing management, because there would be no additional facilities constructed that would cause an increase in disturbance from people, traffic, and noise. This alternative would not affect attainment of grazing standards. It would be easier to corral and/or trail cattle under this alternative compared to Alternatives 3 or 4.

Alternative 2
This alternative is less disruptive to grazing management than Alternatives 3 or 4. Since this alternative is outside the Diamond Fork Allotment it has little effect on grazing management. Cattle trail down the Diamond Fork Road in the fall. There is an existing fence on the south side of the road and this would keep cattle out of the proposed site. This alternative would not affect attainment of grazing standards. A gate or a cattle guard would be placed in the existing fence on the road that accesses the group site. It would be easier to corral and/or trail cattle under this alternative than Alternatives 3 or 4.

Alternative 3
This alternative is the most disruptive to grazing management compared to other alternatives.

Brimhall
This site is not part of the Diamond Fork Allotment, but cattle are collected each fall in the Brimhall Pasture just south of the proposed site. A few cattle may enter the area if the public leaves gates open. Cattle currently trail out of Brimhall Pasture and off the Diamond Fork Allotment through the private land to the Diamond Fork Road.
As the private land is developed, access for cattle will not be practical. Cattle would then be trailed down the Brimhall Road to the Diamond Fork Road, generally in four groups of about 500 head of cattle. Numerous trips could also be made with smaller groups of cattle. As this site is not within an allotment, its construction would not directly affect attainment of grazing standards or livestock users. However, it would be more difficult to move cattle through the area with a campground and its users present.
Because some cattle could be in the area with current management and could possibly trail through the area in the future, the campground would be fenced. The fence would also have one 12-foot gate (locked to the public) to get cows out of the campground, if needed, as well as a cattle guard for the entrance road. In addition to fencing around the campsite, the parking area on the north side of the bridge would be fenced. This would prevent cattle damage to vehicles and ease herding. The fence would have a cattle guard or a gate that could be closed while cattle are moving through the area.

Wanrhodes
This site lies within the Diamond Fork Allotment and cattle could be present in the area at any time of the grazing season, depending on the grazing rotation. An influx of people, traffic, and noise into the Wanrhodes area could make it more difficult to keep cattle well spread out in the area. Cattle tend to move away from disturbance and would move toward the lower end of Wanrhodes. It would be more difficult to achieve proper

livestock distribution. Utilization standards would be met sooner and cattle might not be able to remain in this grazing unit as long as with any of the other alternatives.
The upper end of the proposed site at Wanrhodes is located approximately 500 to 700 feet from the proposed site for a cattle corral. This corral would be used to load sick or injured cattle, to hold wild cattle in the fall, and could be used by the public for trail horses. The new corral would replace the existing corral in the dispersed camping site approximately one-half mile up (north) the road. Additional people, traffic, dust and noise in the area could make it difficult to herd cattle into the corrals. The camping area would be fenced. The fence would also have a gate (locked to the public) to get cows out of the campground, if needed, as well as a cattle guard for the public. Approximately 9.6 acres of the 101,900 acre allotment would be closed to grazing.

Monks Hollow
This site is part of the Diamond Fork Allotment and the alternative is second most disruptive to grazing management. Cattle could be present in the area at any time of the year, depending on the grazing rotation. However, it is not located in area that would greatly affect cattle distribution or alter time to attainment of grazing standards. Cattle do trail through the area to access the remainder of the allotment. It would be more difficult to move cattle through the area with people present. The camping area would be fenced. The fence would have one gate (locked to the public) to get cows out of the campground, if needed, as well as a cattle guard for the public. Approximately 14 acres of the 101,900 acre allotment would be closed to grazing.

Alternative 4
The effects and mitigation to grazing are generally the same as described for Alternative 3 at Monks Hollow. However with all 475 PAOT at this one site, the effects would be more intensified in this area. Approximately 20 acres of the 101,900 acre allotment would be closed to grazing.

INDIAN TRUST ASSETS

Affected Environment
Indian trust assets are defined as legal interests in property held in trust by the United States for Indian tribes or individuals, or property that the United States is otherwise charged by law to protect. The United States has a trust responsibility to protect and maintain rights reserved by or granted to American Indians or Indian individuals by treaties, statutes and executive orders. These rights are sometimes further interpreted through court decisions and regulations. This trust responsibility requires that all Federal agencies take all actions reasonably necessary to protect this trust. As Federal agencies, the Mitigation Commission and the Forest Service will be responsible for carrying out their Indian Trust responsibilities.

Environmental Effects
All Alternatives - There would be no Indian trust assets affected under any of the alternatives.

ENVIRONMENTAL JUSTICE

Affected Environment
Executive Order 12898 established environmental justice as a Federal agency priority. Federal agencies are to consider the disproportional effect their actions may have on minority and low income populations.

Environmental Effects
All Alternatives - There would be no disproportional environmental effects on minority and low income populations.

CUMULATIVE IMPACTS

This section briefly describes other interrelated projects that may contribute to cumulative impacts. Cumulative impacts are the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time. For the purposes of this analysis, the cumulative effects analysis area is the Diamond Fork Watershed (see Map 5, Cumulative Effects Analysis Area Map). Impacts from any of the action alternatives are not anticipated outside this analysis area.

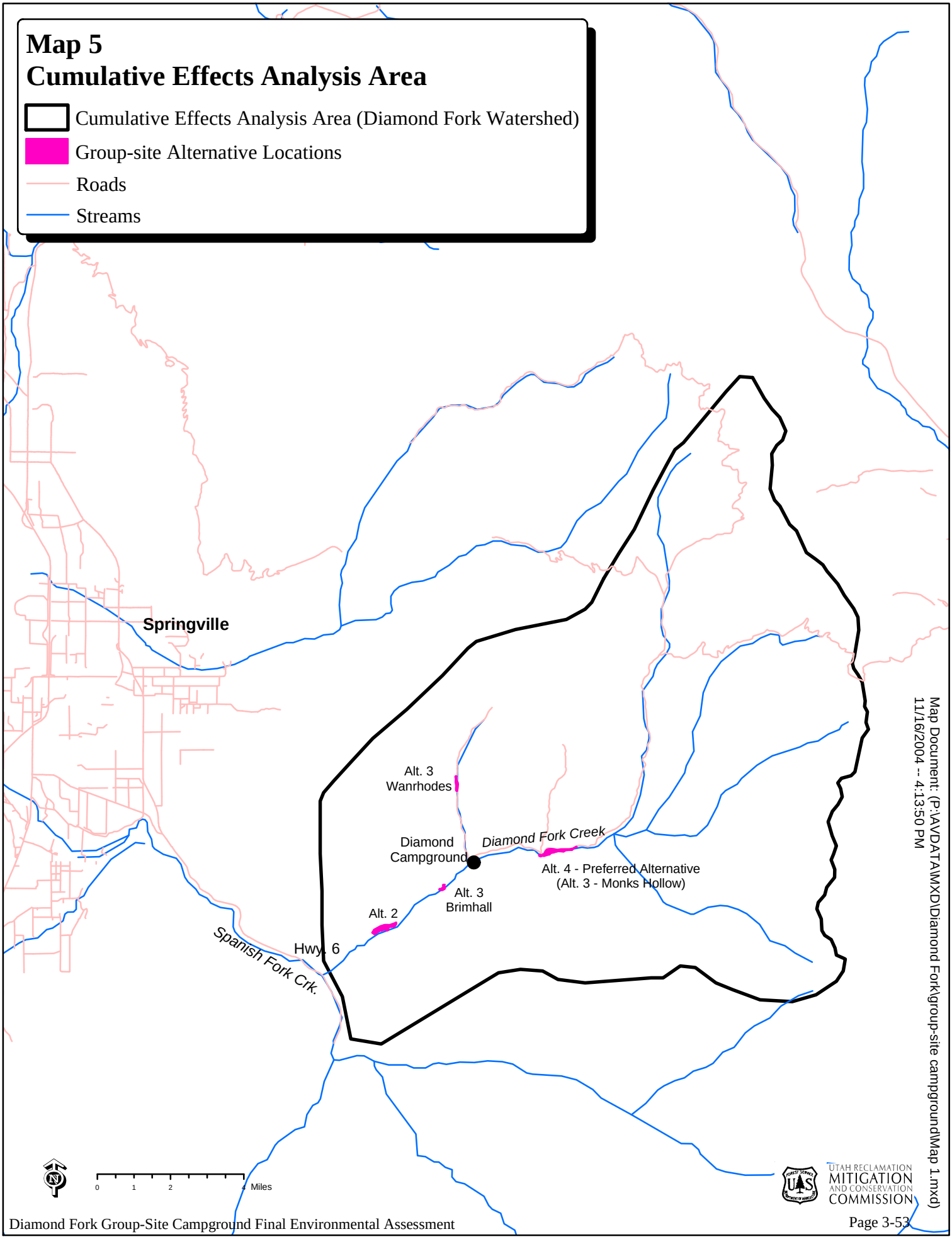
Description of Past, Present and Future Projects

Past Interrelated Projects
Strawberry Tunnel, Syar Tunnel and Inlet, Sixth Water Aqueduct
Construction on the Strawberry Valley Project began in 1906 and was completed in 1922 when the Strawberry Tunnel was put into operation. The projects captures water in the Uintah Basin and transports it for irrigation use in the Bonneville Basin via Diamond Fork. The Strawberry tunnel diverted an annual average of 61,500 acre-feet of water from Strawberry Reservoir into Sixth Water and Diamond Fork Creeks resulting in artificially high flows during the summer irrigation season. The high flows have caused extensive deterioration of natural stream channels and have resulted in severely limited fish production, loss of riparian and wetland habitat, and reduced recreational experiences along Sixth Water and Diamond Fork Creeks.

In 1956, Congress authorized the construction of the Central Utah Project (CUP). The CUP, when fully implemented, will transport up to an additional 101,900 acre-feet of Bonneville Unit water on top of Strawberry Valley Project water through Diamond Fork. The additional diversions of the Bonneville Unit required the construction of a conveyance facility with greater capacity than the Strawberry Tunnel. Consequently, the Syar Tunnel and Sixth Water Aqueduct were constructed to convey Strawberry Valley Project and Bonneville Unit water. The Strawberry Tunnel, which is higher in the system, will still be used to convey in-stream flow deliveries to Sixth Water Creek and

would deliver irrigation supplies (up to a maximum of 200 cfs) during emergencies when Syar Tunnel/Sixth Water Aqueduct are inoperable. Strawberry Valley Project and CUP water deliveries through the Syar Tunnel began in the spring of 1996.

Diamond Fork Pipeline and Road Construction
To mitigate for the anticipated impacts resulting from the additional diversions of CUP water into Diamond Fork and to reduce the impacts from Strawberry Valley Project deliveries, a 510 cfs capacity pipeline was constructed from Monks Hollow to the mouth of Diamond Fork Canyon. The pipeline will carry a portion of the imported water, allowing for a more natural hydrograph in Diamond Fork Creek. The pipeline has been constructed primarily in the existing road corridor from the mouth of Diamond Fork Canyon to Monks Hollow and a seven mile 24-foot-wide asphalt-surfaced road has been


Map 5
Cumulative Effects Analysis Area
Cumulative Effects Analysis Area (Diamond Fork Watershed)
Group-site Alternative Locations
Roads
Streams
Springville
Alt. 3
Wanrhodes
Diamond
Campground
Diamond Fork Creek
Alt. 4 - Preferred Alternative
(Alt. 3 - Monks Hollow)
Alt. 3
Brimhall
Alt. 2
Hwy. 6
Spanish Fork Crk.
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MITIGATION
AND CONSERVATION
COMMISSION

constructed over the top of the pipeline. Construction of the pipeline and road were completed in 1997. The Diamond Fork Pipeline was put into operation in June 2004.

Diamond Fork Campground Reconstruction
As described in greater detail in Chapter 1, the Forest Service and Mitigation Commission reconstructed the Diamond Fork Campground in 2000. The new facility has a capacity approximately 33 percent smaller than the original facility. This reduction in capacity was achieved by removing group-site facilities from the campground and single family campsites from the active floodplain of Diamond Fork Creek. The purpose for the reduction in campground capacity was to minimize impacts on riparian vegetation and to maximize the opportunities for stream restoration afforded by the construction of the Diamond Fork Pipeline. The group-site facilities removed from the Diamond/Palmyra campground had a capacity of approximately 330 PAOT. The total reduction in campground capacity was approximately 190 PAOT.

Angler-Access and Wildlife Mitigation Land Acquisitions.
As described in greater detail in this Chapter, lands have been acquired in Diamond Fork to partially mitigate for the impacts on fish and wildlife resources from the construction and operation of CUP. The lands include the *Lower Diamond Fork Mitigation Lands,* approximately 168 acres at the mouth of Diamond Fork; the *Redford Mitigation Lands* approximately 617 acres on the north side of Diamond Fork road near the mouth of Diamond Fork; and *Red Hollow (also referred to as the Diamond Properties)* approximately 640 acres. These lands will be managed for fish and wildlife purposes and public access.

Historic Land Use Practices
American Indians utilized Diamond Fork as a travel route, plant gathering, and hunting area, but had no long-term effects on its ecology. Diamond Fork's proximity to Utah Valley means that it has seen considerable use since European-American settlement in the mid 1800's. Some logging and stone quarrying was done, but the primary use of the canyon was for water conveyance (described above), homesteading, recreation, and livestock grazing. Recreational use of the area really began after 1906, when the canyon's road was improved enough to encourage hunters, fishers, and campers to visit the area with increasing frequency each decade. Like most areas in northern Utah, the Diamond Fork watershed was added to the Uinta National Forest in the early 1900's primarily to protect it from further overgrazing. The Forest responded by working with livestock operators to reduce the number of livestock and seasons of use. They also did large-scale reseeding projects in the heads of several Diamond Fork tributaries in the 1950's and 60's.

Considerable land clearing for homesteads occurred in Diamond Fork and its tributaries during the late 1800's and early 1900's. Sage, oak, and riparian plant communities on relatively level terraces along and above perennial streams were replaced by crops that included wheat and potatoes. Most families also grazed livestock on adjacent lands. Many of these farms failed in the 1930's, and were placed under Forest Service management. Since these abandoned fields were prone to wind and water erosion, the Uinta National Forest reseeded these farms with crested wheatgrass and smooth brome in the 1940's and 50's.

Over the past century there have been many locations on Diamond Fork Creek where the stream bank has been hardened. These efforts were to serve a variety of purposes such as flood control, protecting infrastructure (roads, campgrounds, water conveyance facilities etc.) from lateral migration of Diamond Fork Creek and for agriculture production.

Red Hollow Prescribed Fire
An environmental assessment and decision for the Diamond Fork Prescribed Fire project were completed and issued in 2001. The decision called for the treatment, by burning, of six units within the Diamond Fork watershed. Approximately six percent of the vegetation within the watershed is to be treated by burning. The Red Hollow Unit was burned in the spring of 2003. The objective of this burn was to regenerate oak and aspen. Prescribed fire was applied to 1,200 acres within this burn unit. The objective of burning 40% of the oak was met. Limited success was obtained in regenerating the few, isolated clones of aspen in this unit.

Reconstruction of Three Forks and Monks Hollow Trailheads
These trailheads were reconstructed in 2001 and 2003 respectively. Improved parking facilities and vault toilets were provided to reduce the adverse impacts of heavy recreation use to riparian resources at these locations.

Springville Crossing-Rays Valley Road Reconstruction
The Uinta National Forest moved the Rays Valley road from its old location along a riparian zone to an upland site where it would be away from the stream. The desired future condition is to have less sediment from the road getting into the stream. This section of road is 3 miles in length and the project was completed in 2003. The old road has been reshaped and seeded and the new road has a gravel surface for safer and better all-weather access and protection against erosion.

Watershed Protection Fencing
Historically, high irrigation flows in Diamond Fork Creek served as a barrier for cattle movement. When the Diamond Fork System becomes fully operational and high flows are removed from Diamond Fork Creek, cattle movement will not be restricted as before. Fencing was completed to control grazing at the upper end of the Right Fork of Hobble Creek near the Diamond Fork Creek junction; several acres were fenced for stream bank vegetation rehabilitation in 2003.

Redford Fencing
In an effort to improve wildlife habitat on CUP wildlife mitigation lands in lower Diamond Fork, the Mitigation Commission completed construction of a four-strand barbed wire fence to exclude cattle grazing in this section of the river corridor in November 2003. The four-strand barbed wire fence is approximately 3.25 miles in length on the south side of Diamond Fork Creek. Wire spacing will allow for wildlife passage.

Present Interrelated Projects
Diamond Fork System Completion
The Diamond Fork System, an integral component of CUP, is presently being completed by constructing a number of water delivery facilities in Diamond Fork. The system would take water from the Syar Tunnel and deliver it to the Diamond Fork Pipeline

through a series of tunnels and pipelines. The system was completed in June 2004 and will allow for the removal of a portion of the high irrigation flows in Sixth Water and Diamond Fork Creek thereby allowing for a more natural hydrograph. The completed delivery system, along with mandates from CUPCA, will also provide minimum stream flows in Sixth Water and Diamond Fork Creek. The recently completed components of the Diamond Fork System in the cumulative impacts analysis area include the Sixth Water Connection, Tanner Ridge Tunnel, Upper Diamond Fork Pipeline, Upper Diamond Fork Tunnel, Diamond Fork Outlet and connection to the Diamond Fork Pipeline.

Dispersed Camping Management
Over the past three years the Spanish Fork Ranger District has inventoried dispersed camping sites across the District. The purpose of the inventory is to identify sites that should be closed for resource protection or hardened for continued dispersed use. In the Diamond Fork drainage all dispersed camping has been prohibited in the lower 7.5 miles. Three sites have been approved for management as a day use or dispersed camping. These sites are Red Ledges, Dry Canyon, and Sawmill Hollow. A primary consideration in the design of these sites was the need to protect riparian resources and wet meadows.

Halls Fork Prescribed Fire
This burn unit is part of the Diamond Fork Prescribed Fire project described above. The Halls Fork Unit was scheduled to be burned in late 2004 or 2005. The objective of this burn is to regenerate aspen and oak on 40 to 60 percent of the acres where these vegetation types occur. Prescribed fire was to be applied to approximately 2,400 acres in this burn unit in September 2004. Post burn inventory will be conducted over the next three years.

Future Projects
Sixth Water and Diamond Fork Creek Restoration and Monitoring
A key element to mitigation in Diamond Fork is the restoration and Sixth Water and Diamond Fork Creeks. With the completion of the Diamond Fork System, a portion of the high irrigation flows will be removed from Sixth Water and Diamond Fork creeks along with the provision of minimum stream flows. A monitoring program will be developed and implemented to measure the response to flow changes resulting from the operation of the Diamond Fork System. A conceptual aquatic and riparian habitat restoration plan for Diamond Fork from Diamond Fork pipeline outlet to the Spanish Fork River will be developed.

Utah Lake Drainage Basin Water Delivery System (ULS) Powerplants
As part of the ULS two hydroelectric generating plants would be constructed on the Diamond Fork System. The Sixth Water Power Facility would consist of a 45 megawatt (MW) generator located at the Sixth Water Aqueduct outlet. Power would be generated from water flowing through the Syar Tunnel and down the aqueduct located adjacent to the Sixth Water Flow Control Structure. The fenced power facility building and surrounding area would cover 0.7 acre. The Upper Diamond Fork Power Facility would consist of a 5 MW generator located adjacent to the Upper Diamond Fork Flow Control Structure. Power would be generated from water flowing through the Tanner Ridge Tunnel and Upper Diamond Fork Pipeline. The fenced power facility building and surrounding area would cover 0.3 acre.

Diamond Fork Recreation Facilities
The Diamond Fork System not only included the construction of water conveyance facilities but also construction of recreation features to benefit the public. The Forest Service, in cooperation with the Mitigation Commission, developed a plan in 2000 identifying a conceptual list of recreation features that would complete the recreation commitments of the Diamond Fork System. The plan tiered to the Diamond Fork Area Assessment completed in 2000. The projects include the following: The reconstructed Diamond Campground; a group-site campground which is the focus of this environmental assessment, angler-access parking areas and restrooms, a day use area at Red Ledges, education and interpretive sites, and trailhead improvements at Sawmill Hollow and Fifth Water. Also included in the plan are non-Diamond Fork System recreation features that the Forest Service planned as part of their own program including trailhead improvements at Three Forks (completed) and Monks Hollow, and inventory and management of dispersed camping sites (in progress, see discussion above).

Range Improvements
Historically, high irrigation flows in Diamond Fork Creek served as a barrier for cattle movement. When the *Diamond Fork System* becomes fully operational and high flows are removed from Diamond Fork Creek, cattle movement will not be restricted as before. Additional fencing may be required in some locations to keep cattle in the appropriate grazing units.

Monks Hollow Motorized Trail
The Forest Service proposes to construct 1.2 miles of new trail that would be suitable for motorized use (ATV's and trail bikes), as well as foot, horse, and mountain bike travel. The proposed trail would connect the Teat Mountain and Monks Hollow Motorized trail systems. The proposal responds to a need to provide designated loop riding opportunities as identified in the Forest Plan where ATV use can be controlled and managed.

Other Diamond Fork Prescribed Fires
The Monks Hollow, 1st through 4th Waters, Fifth and Sixth Waters, and Billies Mountain burn units are part of the Diamond Fork Prescribed Fire project described earlier. These four units are scheduled to be burned between 2006 and 2010. Units range in size from approximately 1,100 to 6,800 acres in size. The vegetation management objectives of these burns are similar to those described for Red Hollow and Halls Fork.

Mechanical Fuels Treatment
Mechanical treatment of vegetation to reduce fire hazard is being contemplated on National Forest Lands adjacent to private property in the Little Diamond and Wanrhodes watersheds. These are tributary to Diamond Fork. The predominant vegetation type that would be treated is Gambel oak and associated mountain brush species. A more detailed proposed action will be developed. The environmental analysis for this treatment is scheduled for 2006. It is estimated that between 500 and 1,000 acres would be treated.

Description of Cumulative Effects
The following sections describe the potential cumulative impacts of each alternative when combined with the past, present and reasonably foreseeable interrelated projects described above. If the interrelated project is not identified in the discussion of the issue,

then there are no potential cumulative impacts associated with that interrelated project. The interrelated projects are italicized for ease of identification.

Issue 1. Stream Restoration
The transbasin diversion of water through the *Strawberry Tunnel, Syar Tunnel and Inlet, Sixth Water Aqueduct* and into Diamond Fork Creek resulted in an extremely altered riverine ecosystem and the need for stream restoration. *Historic Land Uses Practices* including stream bank hardening also contributed to the alteration of the riverine ecosystem. Other interrelated projects are being implemented or have elements that will facilitate stream restoration efforts. These include the *Diamond Fork Pipeline and Diamond Fork System Completion* and *Sixth Water and Diamond Fork Creek Restoration and Monitoring.*

Alternative 1
There would be no cumulative impacts with any of the past, present or reasonably foreseeable future projects.

Alternative 2
There would be no direct or indirect impacts for future opportunities for stream restoration and therefore no cumulative affects.

Alternative 3
If the Brimhall site were selected as part of this alternative, it would require stream bank hardening to protect campground facilities from lateral migration of the river channel from just upstream of the existing bridge downstream approximately 1200'. This impact would add cumulatively to the impacts of identified from the interrelated projects.

Alternative 4
There would be no direct or indirect impacts for future opportunities for stream restoration and therefore no cumulative affects.

Issue 2. Effects on Riparian Habitat
The riparian corridor along the main stem of Diamond Fork includes approximately 11 miles, from the confluence with Spanish Fork River to Sawmill Hollow, which historically supported nearly continuous riparian forest dominated by narrowleaf cottonwood, box elder and willow (based on existing vegetation, historical accounts, and aerial photos dating back to 1939). Between 1939 and 1984, when the last series of aerial photos was taken, about 95 percent of the cottonwood forest along the lower four miles of the river corridor disappeared. This was due to the removal of cottonwood to accommodate *Historic Land Use Practices*, as well as loss of trees due to channel migration resulting from operation a the *Strawberry Tunnel, Syar Tunnel and Inlet, Sixth Water Aqueduct*. Introduction of irrigation water from Strawberry Reservoir began in 1922. The average low flows in Diamond Fork have increased from 21 cfs to 249 cfs. Average peak flows have increased from 250 to over 400 cfs. The duration of flows exceeding 200 cfs has increased from an average 20 days per year to 88 days per year. The increased flows resulted in a loss of riparian vegetation which served to stabilize banks and caused widening of the river channel and eventually downcutting. This made the channel and riparian vegetation adjacent to it more susceptible to damage during

natural flood events. As a result, loss of cottonwood forest was accelerated as evidenced by photos and historical accounts.

Diamond Fork System Completion, the Tanner Ridge Tunnel and Upper Diamond Fork Pipeline have been constructed to take irrigations flows from Syar Tunnel to the Diamond Fork Pipeline and became operational in June 2004. This project resulted in some direct impacts on riparian habitats but will allow for a portion of the high irrigation flows to be diverted from the system allowing for restoration of riparian habitats.

Sixth Water and Diamond Fork Creek Restoration and Monitoring The Definite Plan Report for the Bonneville Unit recommends restoration of riparian and aquatic habitat along Diamond Fork below Monks Hollow. CUPCA authorized the Mitigation Commission to plan and administer mitigation and conservation programs to rehabilitate riparian areas and improve fish habitat conditions. The Mitigation Commission and the Forest Service completed a feasibility study to assess the potential for restoration along this stretch. Restoration work will begin once the new hydrological flow regime has been determined. With our present knowledge of future activities in Diamond Fork, it is difficult to predict how many acres of what type of riparian vegetation could be established or restored over what period of time. However, riparian vegetation is expected to increase substantially along the entire corridor as a result of new flow regimes.

The *Diamond Fork Campground Reconstruction* decreased the campground capacity and removed single family campsites and the group-site campground for the purpose of improving riparian habitats. Similarly, *Dispersed Camping Management, Redford and Watershed Protection Fencing and Range Improvement* projects all have elements for the purpose of improving riparian habitats. The *Dispersed Camping Management* projects resulted in a minor (about 0.3 acres) additional direct impact to riparian areas, but were approved with the intent of eliminating unmanaged dispersed camping impacts in riparian and upland habitats along Diamond Fork Creek.

Cumulative Effects

Alternative 1

There would be no cumulative impacts with any of the past, present or reasonably foreseeable future projects. Implementation of this alternative would not result in additional direct impacts to riparian vegetation in the drainage. However, dispersed camping, including camping by groups without a developed site available for use in this drainage, could negatively impact the success or restoration efforts in some limited areas.

Alternative 2

There would be minimal (< 0.1 acre) direct impacts on riparian habitats under this alternative. Indirect impacts could occur in the form of soil compaction, illegal gathering of wood, and the creation of unofficial trails as a result of increase human presence. Indirect impacts would be mitigated by proper signing and travel management and therefore would not add significantly to cumulative affects. The potential for riparian restoration is the higher at this site than any other. Although there would be no direct impacts on riparian vegetation, there would be a lost opportunity for riparian restoration

with the construction of the group-site campground at this location. Providing a developed campsite would help manage dispersed camping and its associated impacts.

Alternative 3
If the Brimhall site were selected as part of this alternative, approximately 1.5 acres of riparian habitat would be directly affected by construction at that site in addition to the negligible impacts at Wanrhodes and Monks Hollow of less than 0.2 acres. This represents about 0.1% of the total riparian habitat in the watershed of about 1457 acres. This impact would add cumulatively with the impacts from the construction of the *Strawberry Tunnel, Syar Tunnel and Inlet, Sixth Water Aqueduct, Diamond Fork Pipeline and Road Construction, Dispersed Recreation Management, and Historic Land Use Practices.* Providing a developed campsite would help manage dispersed camping and its associated impacts. Indirect impacts could occur in the form of soil compaction, illegal gathering of wood, and the creation of unofficial trails as a result of increase human presence. Indirect impacts would be mitigated by proper signing and travel management and therefore would not add significantly to cumulative affects.

Alternative 4
Approximately 0.44 acres of riparian habitat would be affected by construction under this alternative. This represents about 0.03% of the total riparian vegetation in the watershed of about 1457 acres. Indirect impact could also occur but would be mitigated through proper signing and fencing. This impact would add cumulatively with the impacts resulting from construction of the *Strawberry Tunnel, Syar Tunnel and Inlet, Sixth Water Aqueduct, Diamond Fork Pipeline and Road Construction, Dispersed Recreation Management, and Historic Land Use Practices.* Providing a developed campsite would help manage dispersed camping and its associated impacts. Indirect impacts could occur in the form of soil compaction, illegal gathering of wood, and the creation of unofficial trails as a result of increase human presence. Indirect impacts would be mitigated by proper signing and travel management and therefore would not add significantly to cumulative affects.

Issue 3 Ute Ladies'-Tresses
Historic Land Use Practices including the grazing history of the Diamond Fork drainage, combined perhaps with timber cutting activities and fire suppression, have played a part in accelerating stream erosion and downcutting of Diamond Fork Creek. The stream downcutting had the effect of moving ULT habitat away and below the level of the hay fields, making those fields no longer suitable as habitat but creating a certain amount of new habitat for this early seral species. Any plowing that occurred in agricultural fields would have directly damaged ULT plants if the fields had been orchid habitat.

The greatest effect on ULT population levels in the Diamond Fork drainage has been the trans-basin diversion of irrigation water into the watershed. The resulting stream instability and bank erosion created a continual unnaturally high acreage of early seral riparian habitat that the ULT colonized to the point of becoming one of the largest populations of the species in the western United States.

Historically, cows and horses have grazed in ULT habitats in some years. There seems to be little effect on the plants, unless the impacts occur during the flowering/fruiting period, when fruit losses from trampling would be additive to those caused by vole

herbivory (Sipes & Tepedino, 1996). Humans occasionally walk through populations, though most are located in areas too wet for long occupancy. It is believed that implementation of the new flow regime will probably result in an improved fishery, which would result in increased fishing pressure and subsequent slight increase in trampling and trailing by fishermen within ULT colonies. Motorized recreation has been increasing in the Diamond Fork watershed in recent decades, and is projected to keep increasing. The Forest Service has taken action to harden parking sites, designate trails and otherwise keep impacts to soil and vegetation resources to a minimum, but a slight increase in OHV-related sedimentation into Diamond Fork Creek can be predicted. This is likely to be small enough not to affect the ULT either adversely or beneficially.

Angler-Access and Wildlife Mitigation Land Acquisitions parcels encompass all of the lower Diamond Fork streamcourse and virtually the entire current and potential ULT habitat is under federal ownership.

The *Springville Crossing-Rays Valley Road* work in 2003 added some sediment into Diamond Fork Creek for a period of time. The *Diamond Fork Pipeline and Road Construction* projects have required extensive construction and road alteration activities within and just uphill from the Diamond Fork riparian area. This has resulted in varying amounts of sediment and other deposits into the water, though mitigation activities have minimized the quantities. If anything, added sediment may have added to habitat formation for ULT. The new flow regime is expected to improve the overall health and resilience of the riparian and aquatic systems, however, some reduction in suitable habitat for ULT and some shifting of colony locations are expected, up to a 25% reduction. Even so, the U. S. Fish and Wildlife Service's Determination of Effect in their Biological Opinion was that the Central Utah Project with the associated cumulative impacts and project design conservation measures "may effect, but is not likely to jeopardize the continued existence" of the species (USFWS 1999).

The proposed *Utah Lake Drainage Basin System* includes the construction of three new small powerhouses along the existing pipeline and reconstruction of parts of the existing powerlines in Diamond Fork drainage. These smaller construction activities will not likely to have any major impacts on ULT habitat or plants because they will be constructed in relatively dry riparian to upland sites.

Cumulative Affects
Alternative 1
There would be no cumulative affects on Ute ladies'-tresses.

Alternative 2
This site is located in close proximity to ULT habitat with the highest recorded density of flowering plants. The potential for indirect impacts on ULT's would be greatest under this alternative. This impact would add cumulatively to past, present and reasonably foreseeable interrelated projects.

Alternative 3
There would be no direct impacts to Ute ladies'-tresses under this alternative. The nearest colony is located approximately 1/3 mile downstream from the lower end of this site. This colony has a one-year maximum of 17 flowering individuals, recorded in 1998

which represents only 0.1 percent of the plant population in Diamond Fork Canyon. Therefore, indirect impacts would be negligible and would not result in cumulative impacts.

Alternative 4
Same as Alternative 3.

Other Issues

Endangered, Threatened and Sensitive Plants

All Alternatives
There will be no cumulative impacts to clay phacelia, Deseret milkvetch, Garrett's bladderpod, rockcress draba, Barneby woody aster, Wasatch jamesia, Dainty moonwort and slender moonwort due to their lack of habitat or occurance along Diamond Fork Creek and the proposed group sites.

Endangered, Threatened and Sensitive Animals

Alternative 1
There would be no cumulative impacts from campground construction with any of the past, present or reasonably foreseeable future projects. Implementation of this alternative will still have direct impacts to riparian vegetation in the drainage from uncontrolled dispersed camping, recreation activities, and grazing. Dispersed camping, including camping by groups without a developed site available for use in this drainage, could negatively impact the success or restoration efforts in some limited areas, causing further reduction in the quality of the habitat needed for threatened, endangered and sensitive species.

Indirect cumulative effects to bald eagles from human disturbance associated with recreational activities will continue, with a potential increase due to the increasing demand for recreation.

Effects Common to Alternatives 2, 3 and 4

Bonneville cutthroat trout have not been found in the lower Diamond Fork drainage. Since there could be Bonneville trout at the lower reaches, there are minimal indirect impacts from fishing pressure.

Increased public activity resulting from enhanced access to the riparian and stream corridor may alter the presence and behavior of aquatic species in habitat areas within and adjacent to the project area. These effects will be localized and will not affect aquatic species watershed-wide and/or at the population level.

Implementation of any of the action alternatives will have direct cumulative impacts through loss of riparian vegetation in the drainage from *Historic Land Use Practices*, and the *ULS Powerplant* installation. . Dispersed camping, including camping by groups without a developed site available for use in this drainage, could negatively impact the

success or restoration efforts in some limited areas, causing further reduction in the quality of the habitat needed for threatened, endangered and sensitive species.

Indirect cumulative effects to bald eagles from human disturbance associated with recreational activities will continue, with a potential increase due to the increasing demand for recreation.

Alternative 2
There are no direct or indirect impacts to the bald eagle, Western yellow-billed cuckoo, or Townsend's big-eared bat at this site. Cumulative effects for these species would be the same as Alternative 1.

There are minimal cumulative indirect impacts to the Columbia spotted frog due to its close proximity to this campground site. Additional human disturbance from people fishing along Diamond Fork Creek could inadvertently lead to trampling of the frog's egg masses.

Alternative 3
Brimhall
There are no direct or indirect impacts to the Townsend's big-eared bat or Columbia spotted frog at this site. Cumulative effects for these species would be the same as Alternative 1.

Construction of a group site at this location has a direct effect on the bald eagle and Western yellow-billed cuckoo through the loss of riparian habitat. The area around this site has a high concentration of bald eagles during the winter months. Though no cuckoos inhabit this area, removal of riparian habitat, and the indirect effect of human disturbance will affect the quality of habitat available.

Past *historic land use practices* have caused a reduction of riparian habitat along the Diamond Fork Creek, causing a loss of winter roosting trees for the bald eagle, and nesting habitat for the cuckoo. The small amount of riparian habitat lost at this site (1.5) would have a negative cumulative effect on these species. Any negative effects will be negated through projects designed to reduce impacts to, and restoration of the riparian habitat (*Reconstruction of the Diamond Fork Campground, Reconstruction of the Three-Forks Trailhead, Diamond Fork System completion, dispersed camping management, Sixth Water and Diamond Fork Creek restoration).*

Wanrhodes
There are no direct or indirect impacts to the bald eagles, Western yellow-billed cuckoo, Townsend's big-eared bat or Columbia spotted frog at this site. There are no cumulative affects associated with past, present or reasonably foreseeable future interrelated projects that would lead to significant adverse effects from this site.

Monks Hollow
There are no direct impacts to the bald eagles, Western yellow-billed cuckoo, Townsend's big-eared bat or Columbia spotted frog at this site. There are no indirect impacts to the Columbia spotted frog. Cumulative direct effects for these species would be the same as Alternative 1.

Indirect effects to bald eagles, Western yellow-billed cuckoo, and Townsend's big-eared bat at this site are a result of human disturbances. While there will be limited camping during the winter months, a potential for camping here does exist. This may cause a short-term (hours to days depending on the amount of disturbance) abandonment of the area by bald eagles. The eagles would return to the area once the disturbance is removed.

Disturbances associated with the normal operation of a campground could preclude this area from being used by the cuckoo.

The Townsend's big-eared bat is found at a location less than one mile away from this site. Increased human activities such as rock climbing in the area could lead to disturbance of the adits from hikers, causing the bats to abandon the adit.

Past projects in Diamond Fork have also directly impacted bald eagles and western yellow-billed cuckoos. Past *historic land use practices* have caused a reduction of riparian habitat along the Diamond Fork Creek, causing a loss of winter roosting trees for the bald eagle, and nesting habitat for the cuckoo. The small amount of riparian habitat lost at this site (less than 0.1 acre) would not have a negative cumulative effect on these species. Any negative effects will be negated through projects designed to reduce impacts to, and restoration of the riparian habitat (*Reconstruction of the Diamond Fork Campground, Reconstruction of the Three-Forks Trailhead, Diamond Fork System completion, dispersed camping management, Sixth Water and Diamond Fork Creek restoration).*

Alternative 4

There are no direct or indirect impacts to the Columbia spotted frog from development and use of a group campground at this site.

There would be direct impacts to the bald eagles and Western yellow-billed cuckoos at this location. Construction of the administrative access road will impact approximately 0.44 acres of floodplain and riparian habitat. Past *historic land use practices* have caused a reduction of riparian habitat along the Diamond Fork Creek, causing a loss of winter roosting trees for the bald eagle, and nesting habitat for the cuckoo. The amount of riparian habitat lost at this site will have a negative cumulative effect on these species. Any negative effects will be mitigated through projects designed to reduce impacts to, and restoration of the riparian habitat (*Reconstruction of the Diamond Fork Campground, Reconstruction of the Three-Forks Trailhead, Diamond Fork System completion, dispersed camping management, Sixth Water and Diamond Fork Creek restoration).*

Indirect effects to bald eagles, Western yellow-billed cuckoo, and Townsend's big-eared bat at this site are a result of human disturbances. These disturbances will have a greater impact than those described in alternative 3 due to the increased number of PAOT's associated with this site (275 in alternative 3, 475 in alternative 4). More acres are disturbed in this alternative than in alternative 3 as the campground is spread out to both sides of the creek and sites at the Monks Hollow trailhead. While there will be limited camping during the winter months, a potential for camping here does exist. This may cause a short-term (hours to days depending on the amount of disturbance) abandonment

of the area by bald eagles. The eagles would return to the area once the disturbance is removed.

Disturbances associated with the normal operation of a campground could preclude this area from being used by the cuckoo.

The Townsend's big-eared bat is found at a location less than one mile away from the main site, and about ¼ mile from the Monks Hollow trailhead. Increased human activities in the area could lead to disturbance of the adits from hikers or rock climbers, causing the bats to abandon the adit.

Management Indicator Species
The Northern three-toed woodpecker is eliminated from further discussion due to lack of or limited habitat, and from lack of historic occurrence within the Diamond Fork watershed. The Northern goshawk was eliminated due to abandonment of their territory and no establishment of a new territory within the watershed. Colorado River cutthroat trout are not endemic to this drainage and are not present within the Diamond Fork drainage. Bonneville cutthroat trout are discussed in the Threatened, Endangered and Sensitive Fish and Wildlife section above. This section will discuss the cumulative effects on beaver.

Alternative 1
There would be no permanent habitat loss from construction activities under this alternative and therefore, no cumulative impacts from the proposed project. There will be the potential for increased loss of riparian habitat from dispersed recreation use, including impacts from camping by groups that don't have any developed group sites to use in the drainage.

Effects Common to Alternatives 2, 3, and 4
Past *historic land use practices* have caused a reduction of riparian habitat along the Diamond Fork Creek, resulting in a loss of willows habitat for the beaver.

High irrigation flows in Diamond Fork Creek from the operation of the *Strawberry Tunnel, Syar Tunnel and Inlet, Sixth Water Aqueduct* have prevented beavers from using the various project areas to a large degree. The increased flows wash out the beaver dams. The new flow regime since completion of the *Diamond Fork System* will allow for improved habitat for beavers.

Recently completed and currently on-going projects designed to include improvements for the riparian corridor along Diamond Fork include *the Diamond Fork System completion, dispersed camping management, Springville Crossing-Rays Valley Road reconstruction, and Redford fencing.* Protection and improvements to the riparian corridor will improve conditions for the beaver. The negative aspect of these projects are that these improvements make it easier for people to access the Diamond Fork watershed leading to increased human disturbances along Diamond Fork Creek.

The *Sixth Water and Diamond Fork Creek restoration* will improve riparian conditions for beaver. Bank stabilization and restoration of the creeks will improve the riparian corridor and that will benefit the beaver.

Alternative 2
This alternative will have limited cumulative impacts. Currently there are no beaver located at this site. There will be no permanent habitat loss from construction activities, therefore, no cumulative impacts from this alternative.

Alternative 3
Brimhall
This alternative will have limited immediate cumulative impacts. Currently there are no beaver located at this site. Given the historic loss of riparian habitat, especially cottonwoods and willows, further human disturbances and habitat restrictions will limit the beaver in relocating to this area now that the *Diamond Fork System* is completed..

Wanrhodes
Currently there are beaver present in the lower reaches of Wanrhodes Creek. This site is in the upper reaches of the creek and does not have adequate habitat to support a beaver population. Construction of a camp site at this location will not cumulatively effect beaver populations.

Monks Hollow
This alternative will have limited immediate cumulative impacts. Currently there are no beaver located at this site. Habitat is limited at this site and several reaches of the stream at this location are too incised for beaver to build a dam. Construction of a camp site at this location will not cumulatively effect beaver populations.

Alternative 4
This alternative will have limited immediate cumulative impacts. Currently there are no beaver located at this site. Habitat is limited at this site and several reaches of the stream at this location are too incised for beaver to build a dam. Construction of a camp site at this location will not cumulatively effect beaver populations..

Neo-tropical Migratory Birds
While an emphasis is placed on riparian area protection for neo-tropical migratory birds, almost all bird species that could be found in Utah are considered neo-tropical migratory birds. Consequently, all habitat types have the potential to have a neo-tropical bird associated with it. Of the 231 breeding bird species with the potential to be found in Utah, 81 have been found within the Diamond Fork watershed during neo-tropical migratory bird surveys.

Alternative 1
Neo-tropical migratory birds will continue to use the watershed as it currently exists. There will be no permanent habitat loss from construction of a campground. Cumulative impacts on habitat will occur from uncontrolled dispersed group recreational activities within the riparian corridor that lies between the Diamond Fork Creek and Diamond Fork Road, around Monks Hollow, and in the Wanrhodes area. Indirect impacts from human disturbances will increase as more demand is put upon the watershed from people seeking recreational activities

Effects Common to Alternatives 2, 3, and 4
Dispersed Camping Management and the *Monks Hollow Motorized Trail* are projects currently undergoing analysis and/or are due for implementation in the Diamond Fork watershed. The objectives of the *Dispersed Camping Management* project include the protection of riparian and wildlife habitats from unmanaged dispersed recreation use. Similarly, the *Monks Hollow Motorized Trail* system will provide the public with designated riding areas. The *Monks Hollow Motorized Trail* will increase impacts on upland habitat dependent neo-tropical migrants due to human disturbances in the new designated riding area but tend to decrease impacts in other areas by reducing unregulated ATV use in non-designated areas.

Past historic land use practices including grazing and uncontrolled dispersed recreation use will continue to reduce undisturbed areas necessary for nesting birds. The *Lower Diamond Fork Mitigation Lands* will provide undisturbed areas. The *Sixth Water and Diamond Fork Creek restoration* will provide an improvement in riparian habitat.

Alternative 2
This area is currently receiving little impact from unmanaged recreational activities. Approximately six acres of upland habitat would be permanently lost for use to neotropical migratory birds.

Alternative 3
Brimhall
Loss of the riparian habitat at this location will cumulatively impact neo-tropical nesting birds by removal an already limited habitat type.

Wanrhodes
The Wanrhodes site has currently been impacted by uncontrolled dispersed camping. Construction of a campsite at this location would make it possible to control this camping. Since the campsite is only going to occupy 9.6 acres, it would be possible to do restoration work on the area surrounding the proposed site, improving the habitat for neo-tropical migratory birds.

Monks Hollow
Construction of a campsite at this location will have limited cumulative effects on the area. This area has already been disturbed by the *Diamond Fork System Completion* as it was the staging area for the construction work during completion of the project. Prior to that, the area was impacted by uncontrolled dispersed camping, and was bisected with unclassified roads. Many areas were devoid of vegetation prior to clearing for the construction project. Though this area could be re-vegetated, it will still be subject to the future needs of campers in the Diamond Fork area.

Alternative 4
In addition to the effects discussed above, there will be more cumulative effects from this alternative. This alternative will occupy a larger area for the facilities. The first location is the same as the Monks Hollow site described in Alternative 3.

The second site, at the *Monks Hollow Trailhead,* will not cumulatively affect this area. The area is a popular trailhead to the Monks Hollow ATV trail. Providing a place for the ATV campers to use, will limit dispersed camping in other areas.

The third site, located on the south side of Diamond Fork Creek and accessible by only a footbridge, will add the most to the cumulative impacts. To build the footbridge at this area would remove riparian vegetation at this site. Given the current losses to riparian habitat from *past historic land uses,* removal of riparian habitat at this location will decrease forage and nesting habitat. Building an access road for construction and maintenance of this site will further remove nesting habitat.

Species of Concern

Alternative 1

Dispersed Camping Management and the *Monks Hollow Motorized Trail* are projects currently undergoing analysis and/or are due for implementation in the Diamond Fork watershed. The objectives of the *Dispersed Camping Management* project include the protection of riparian and wildlife habitats from unmanaged dispersed recreation use. Similarly, the *Monks Hollow Motorized Trail* system will provide the public with designated riding areas. The Monks Hollow Motorized Trail may tend to increase impacts on wildlife due to human disturbances in the new designated riding area but tend to decrease impacts in other areas by reducing unregulated ATV use in non-designated areas.

Alternative 2

Construction of a campground at this location has no direct or indirect effects to golden eagles. None of the past, present or foreseeable future projects will have any effect to golden eagles nesting in the Lower Diamond Fork territory due to the location of the nest site on the side of steep cliffs.

There are will be no direct effects on leatherside chub and indirect effects will be minimal. The incremental increase in indirect impacts will not result in a significant impact to the species.

Alternative 3

Brimhall

Construction of a campground at this location has no direct or indirect effects to golden eagles. None of the past, present or foreseeable future projects will have any effect to golden eagles nesting in the West of Brimhall Canyon territory due to the location of the nest site on the side of steep cliffs.

There are will be no direct or indirect effects on leatherside chub. Therefore there will be no cumulative effects.

Wanrhodes

Construction of a campground at this location has no direct or indirect effects to golden eagles as they are not found in the Wanrhodes area. Therefore there will be no cumulative effects.

There are will be no direct effects on leatherside chub and indirect effects will be minimal. The incremental increase in indirect impacts, if any, will not result in a significant impact to the species.

Monks Hollow
Construction of a campground at this location has no direct or indirect effects to golden eagles. None of the past, present or foreseeable future projects will have any effect to golden eagles nesting in the Red Mountain South territory due to the location of the nest site on the side of steep cliffs, and because the Red Mountain South territory has not been occupied since 2000.

There are will be no direct effects on leatherside chub and indirect effects will be minimal. The incremental increase in indirect impacts, if any, will not result in a significant impact to the species.

Alternative 4
The impacts from this alternative are the same as the impacts described for the Monks Hollow site under Alternative 3.

Recreation
Interrelated projects that have impacted recreation resources in Diamond Fork include; reconstruction of *Diamond Fork Campground*, *Three Forks Trailhead*, *Monks Hollow Trailhead, Dispersed Camping Management, Angler access parking areas* and *Monks Hollow Motorized Trail* connector to the Teat Mountain Trail. With the current demand for recreation opportunities, this proposal will help meet some of this demand. Not all demand will be met in the Diamond Fork area because of its narrow canyon topography. Unmanaged recreation is a concern for the Forest Service and this proposal, along with the *Dispersed Camping Management* program, would directly convert these areas to managed recreation with construction of the group-site campground. We have seen vast improvements to vegetation and soil compaction in areas that go from unmanaged to managed recreation. An example of this is in the new Diamond Campground, where vegetation is coming back in areas that were once heavily impacted.

The increasing level of recreation use in Diamond Fork is having a negative impact on riparian resources and associated wildlife habitat in select areas, particularly Fifth Water and lower Diamond Fork. This use is also resulting in some user conflicts between mountain bikers, anglers, hikers, ATV riders, horseback riders and livestock, which may escalate if not addressed. The increasing number of year-round residents is also changing the nature of the canyon. What was once viewed as a remote and quiet place is increasingly perceived as a backyard playground. Risks to ecological resources will continue to grow if not reduced through management of the impacting activities. Riparian areas contain the resources currently at most risk, and that trend is expected to continue. This has important social implications, since riparian areas are the ecological areas that people currently value most. User conflicts in riparian areas are also expected to increase, particularly if restoration projects succeed in increasing the quality of fishing in Diamond Fork. User conflicts along road and trail corridors will also increase, as most use will continue in these areas. This has strong social implications, since debate over appropriate activities and activity levels in these intensively used areas may affect resource

management and human activity generally throughout the Diamond Fork watershed (URMCC/USFS 2000).

Alternative 1
This alternative would not provide for the purpose and need of this proposal. The 330 PAOT's lost in the Diamond Campground would not be replaced. Some recreational demand has been addressed with the completion of Diamond Campground, Three Forks and Monks Hollow Trailheads, and angler access parking areas. The increasing demand for recreational group-site camping opportunities in Diamond Fork would not be met and the commitment to construct these facilities would remain.

Alternative 2, 3 and 4
Each of these alternatives would meet the purpose and need for the project by providing additional developed camping opportunities. These improved camping opportunities represent a beneficial impact to the recreation resource by providing additional recreational opportunities. This beneficial impact would add cumulatively to other past, present and reasonably foreseeable impacts on recreation resources.

Heritage Resources
The relatively intense levels of human activity in Diamond Fork have both created the archaeological and historic resources in the canyon, and altered them. The roads, tunnels, and bridges associated with the construction of the *Strawberry Water Project* are considered historic resources. So are the remains of homesteads scattered through the drainage. These sites are subject to weathering and erosion, and have slowly degraded through time. However, recent activities in the canyon associated with recreation, road work, and water conveyance have accelerated that process.

Past projects that have directly adversely affected National Register Eligible sites in the canyon include reconstruction of Highway 6, the *Diamond Fork Pipeline and Road Construction* and the *Springville Crossing-Ray's Valley Road Reconstruction*. On the other hand, few of the reasonably foreseeable projects will result in direct adverse effects to sites, as many will occur in areas with low site densities.

The cumulative impacts of increased recreation in the canyon are having, and will continue to have, indirect effects on sites in Diamond Fork. These recreational activities include illegal artifact theft, defacement of rock art, burning of site structures for firewood, etc. Taken as a whole, these activities are slowly affecting a wider range of sites than those found in project areas where they can more easily be identified and mitigated. As a result, the indirect effects from increased recreation will continue to be one of the biggest threats to the area's archaeological and historical sites.

Alternative 1
There are no direct or indirect impacts on Heritage Resources under this alternative and therefore no cumulative affects.

Alternative 2
There are no direct or indirect impacts on Heritage Resources under this alternative and therefore no cumulative affects.

Alternative 3
There is a single archaeological site located within walking distance of the proposed Monks Hollow site. It is a National Register Eligible homestead cabin that was occupied between 1920 and 1938. There is a chance that this site could be indirectly impacted by site development and increased visitation. These impacts would add cumulatively to past impacts on heritage resources but would be mitigated by the preparation and implementation of monitoring and protection measures, including the construction of a fence around the site.

Alternative 4
The walk-in campsite under this alternative would be within 100 feet of the National Register Eligible homestead site. This would have an adverse effect on the site, which would be mitigated through a Memorandum of Agreement (MOA) with the Utah State Historic Preservation Office. The probability of indirect impacts from increased human presence is also higher under this alternative compared to any of the other action alternatives. These impacts would add cumulatively to past impacts on heritage resources but would be mitigated by the MOA, which would include construction of a fence around the site as well as interpretive signs at the group site describing homesteading in Diamond Fork.

Vegetation and Noxious Weeds
Popular dispersed campsites would continue to be used by large groups, such as those in upper Wanrhodes. The impacts associated with such activity would continue, such as trampling and resultant loss of vegetation, and removal of vegetation for firewood, and soil compaction. Popular sites receive frequent enough use that forbs, grasses and smaller shrubs do not regenerate. Many of these dispersed sites are located in sensitive riparian areas. As recreation demands increase with the growing population along the Wasatch Front, the impacts from large groups have been observed to expand (i.e. existing sites become larger as sites traditionally used by smaller groups are expanded to accommodate larger groups.) This trend is expected to continue. The *Dispersed Camping Management* project is expected to mitigate some of these impacts at selected locations in the Diamond Fork drainage.

Historic Land Use Practices (streambank hardening, grazing, clearing for agricultural production*)* soon after Anglo settlement resulted in loss of most Basin big sagebrush community acreage, and probably loss also of drier riparian vegetation communities in the lower part of the Diamond Fork drainage. Federal Angler-*Access and Wildlife Mitigation Land Acquisitions* has shifted future management of these parcels as wildland ecosystems rather than agriculture or residential subdivisions. The potential now exists for a substantial restoration of appropriate native vegetation in those parcels.

Lightning or man-caused wildfire combined with increasing presence of cheatgrass is likely to put increasing pressure on sustainability of sagebrush communities. Prescribed burning will add an incidental amount of sagebrush loss, since sage communities are not the primary treatment vegetation but parts may be included. The oakbrush and other communities are not at the same level of risk to species sustainability.

The CUP construction headquarters at Monk's Hollow, has recently been reshaped, top-soiled, seeded and planted.

Alternative 1
There are no cumulative affects associated with past, present or reasonably foreseeable future interrelated projects that would lead to significant adverse effects on riparian vegetation, upland vegetation, or from invasive weeds.

Alternative 2
Approximately 6 acres of upland habitat would be impacted under this alternative, less than 0.006 percent of the total land area within the watershed. Mitigation included in this alternative would limit or prevent additional establishment of noxious weeds, thus prevent any or any significant cumulative effects. There are no cumulative affects associated with past, present or reasonably foreseeable future interrelated projects that would lead to significant adverse effects on riparian vegetation, upland vegetation, or from invasive weeds.

Alternative 3
About 4.5 acres of upland habitat would be impacted under this alternative, less than 0.004 percent of the total land area within the watershed. Mitigation included in this alternative would limit or prevent additional establishment of noxious weeds, thus prevent any or any significant cumulative effects. There are no cumulative affects associated with past, present or reasonably foreseeable future interrelated projects that would lead to significant adverse effects on riparian vegetation, upland vegetation, or from invasive weeds.

Alternative 4
Approximately 6.5 acres of upland habitat would be impacted under this alternative, less than 0.006 percent of the total land area within the watershed. Mitigation included in this alternative would limit or prevent additional establishment of noxious weeds, thus prevent any or any significant cumulative effects. There are no cumulative affects associated with past, present or reasonably foreseeable future interrelated projects that would lead to significant adverse effects on riparian vegetation, upland vegetation, or from invasive weeds.

Providing group-site camping facilities at Monks Hollow trailhead, combined with the proposed *Monks Hollow Motorized Trail* interconnection, may increase ATV use on this trail system. Indirect effects of increased ATV use may increase proportionally. However, one of the primary purposes of the Monks Hollow Teat Mountain trail interconnection is to provide users with designated ATV trails to meet the increased demand for this type of opportunity and thereby reduce the likelihood of illegal use of ATV's that has been occurring in recent years. Therefore, indirect impacts from increased ATV use may increase on the trail system, but will tend to decrease in other non-designated areas where impacts from illegal ATV use are of greater concern.

Water Quality and Watershed Resources
The effects of the Central Utah Project on water quality in Diamond Fork Creek are directly related to stream stability in response to augmented flows. Water quality will

continue to be affected until Diamond Fork Creek re-adjusts to post project flow regimes and develops a more natural floodplain and channel morphology.

Alternative 1
There is no direct impact to water quality under this alternative and therefore no cumulative effect. Indirect impacts may include unauthorized dispersed camping along the Diamond Fork Creek corridor, resulting in increased erosion, soil compaction / loss of vegetation and increased sediment delivery to the stream.

Alternative 2
Modeled results yielded minimal upland erosion rates and insignificant amounts of sediment leaving the profile. The incorporation of construction BMPs, erosion control measures, and increasing vegetative cover in the construction footprint and riparian/floodplain buffer into the proposed action will further reduce any potential for sediment transport. There are no direct impacts to water quality under this alternative and therefore no cumulative effects. Indirect impacts to water quality may include minor and unquantifiable sediment delivery to the stream due to increased visitor access.

Alternative 3
Modeled results yielded minimal upland erosion rates and insignificant amounts of sediment leaving the profile. The incorporation of construction BMPs, erosion control measures, and increasing vegetative cover in the construction footprint and riparian/floodplain buffer into the proposed action will further reduce any potential for sediment transport. There would be no direct impact to water quality under this alternative and therefore no cumulative effects. Indirect effects may include increases in camper and angler traffic accessing the stream and floodplain adjacent to the campsites via the interpretative trail. This activity may produce minor and unquantifiable sediment delivery to the stream.

Alternative 4
Modeled results yielded minimal upland erosion rates and insignificant amounts of sediment leaving the profile. The incorporation of construction BMPs, erosion control measures, and increasing vegetative cover in the construction footprint and riparian/floodplain buffer into the proposed action will further reduce any potential for sediment transport. There would be no direct impact to water quality under this alternative and therefore no cumulative effects. Indirect effects may include increases in camper and angler traffic accessing the stream and floodplain adjacent to the campsites via the interpretive trail. This activity may produce minor and unquantifiable sediment delivery to the stream.

Cattle Grazing
There are no cumulative affects associated with past, present or reasonably foreseeable future interrelated projects that would lead to effects on the grazing program.

Table 2 Summary of Environmental Effects				
	Alternative 1 (No Action)	**Alternative 2**	**Alternative 3 (two or more sites)**	**Alternative 4 (Preferred Alternative)**
Driving Issues				
Issue 1. Stream Restoration	No direct or indirect effects on opportunities for future stream restoration efforts.	Same as Alternative 1.	*Brimhall* Would be constructed partially in the active floodplain (approx. 1.9 acres). Stream restoration would be hampered by restricting lateral migration of the river channel and periodic overbank flooding on the active floodplain. *Wanrhodes* No direct or indirect affects. *Monks Hollow* Construction would be outside the active floodplain and would not restrict restoration of Diamond Fork Creek.	With the exception of the administrative access road and footbridge, campground features would be constructed out of the 100-year. The administrative access road and footbridge constructed in the 100-year floodplain would not be protected from overbank flows and the river would not be hardened. The particular section of Diamond Fork where the foot-bridge is proposed is entrenched and lateral migration is not likely.
Issue 2. Riparian Habitats	No direct effects on riparian habitats. Indirect effects would continue from dispersed recreation use.	Less than 0.1 acre impact on riparian habitat from construction. Potential for riparian restoration highest at this site than any alternative. Indirect effects on existing riparian habitats from visitor use.	*Brimhall* Approximately 1.5 acres of riparian habitat affected by construction. Indirect effects from visitor use would be proportionally similar to alternative 2. *Wanrhodes* Less than 0.1 acre of riparian habitat affected from construction.	Approximately 0.44 acres of riparian habitat would be affected by construction. A portion of this amount is already devoid of vegetation. Indirect effects on riparian habitats from visitor use would be proportionally similar to Alternative 2.

Table 2 Summary of Environmental Effects				
	Alternative 1 (No Action)	**Alternative 2**	**Alternative 3 (two or more sites)**	**Alternative 4 (Preferred Alternative)**
			Indirect effects from visitor use would be proportionally similar to alternative 2. *Monks Hollow* Less than 0.1 acres of riparian habitat affected from construction. Indirect effects from visitor use would be proportionally similar to alternative 2.	
Issue 3. Ute ladies'-tresses	New flow regime may result in reduction of suitable habitat for Ute ladies'-tresses and some shifting of colony locations.	No direct effects from construction on Ute ladies'-tresses and its habitats. Indirect effects on Ute ladies'-tresses and its habitats would be greatest under this alternative. Approximately 19 colonies of Ute ladies'-tresses lie in riparian areas immediately adjacent to the site under this alternative. Mitigations measures include trail construction to avoid habitats and prohibiting fuelwood collection.	*Brimhall* No direct effects on Ute ladies'-tresses. Indirect effects would be negligible. The nearest colony is located approximately 1/3 mile downstream from the lower end of this site. *Wanrhodes* There would be no direct or indirect effects on Ute ladies'-tresses. *Monks Hollow* No direct or indirect effects to the species are expected from construction or use of group sites here. The nearest colony of Ute ladies'-tresses is approximately 1.5 miles away.	No direct effects on Ute ladies'-tresses. Indirect effects would be negligible. There is a very small (about 0.025 acre) of potential Ute ladies'-tresses habitat just outside the boundary of the campground. This is about 0.03 percent of the total Ute ladies'-tresses habitat in the watershed.
Other Issues				
Watershed and Water Quality	No direct effect to water quality. Indirect effects may include unauthorized	Water quality in Diamond Fork Creek would not be directly affected through this alternative. Indirect effects may include	*All sites* Same as Alternative 2.	Modeled results yielded minimal upland erosion rates and insignificant amounts of sediment leaving the project area.

Table 2 Summary of Environmental Effects				
	Alternative 1 (No Action)	**Alternative 2**	**Alternative 3 (two or more sites)**	**Alternative 4 (Preferred Alternative)**
	dispersed camping along the Diamond Fork Creek corridor, resulting in increased erosion through soil compaction and loss of vegetation.	increases in camper and angler traffic accessing the stream and floodplain adjacent to the campsites via the interpretative trail. This activity may produce minor and unquantifiable sediment delivery to the stream.		
Endangered, Threatened and Sensitive Plants	No direct or indirect effects.	No direct or indirect effects to clay phacelia, Deseret milkvetch, Garrett's bladderpod, rockcress draba, Barneby woody aster, Wasatch jamesia, Dainty moonwort and slender moonwort due to their lack of habitat or occurance along Diamond Fork Creek and the proposed group sites area.	Same as Alternative 2.	Same as Alternative 2.
Threatened, Endangered and Sensitive Animals	No direct or indirect effects.	*T&E Species* No direct or indirect effects. *Sensitive Species* No direct or indirect effects to bats. Negligible indirect effects on Bonneville Cutthroat Trout. No direct impact on Columbia spotted frogs. Proposed site is in close proximity to wetlands	*Brimhall* *T&E Species* Construction would cause riparian damage that would directly affect winter roosting bald eagle habitat. Indirect effects would also occur if the campground is open for use during the winter months. There is potential habitat for the Western yellow-billed cuckoo at this location. There will be a direct effect from construction of the group site. Construction of the Brimhall group site	Effects would be similar to those described for Monks Hollow under Alternative 3 but proportionally higher with all 475 PAOT located at a single location.

Table 2 Summary of Environmental Effects				
	Alternative 1 (No Action)	**Alternative 2**	**Alternative 3 (two or more sites)**	**Alternative 4 (Preferred Alternative)**
		occupied by spotted frogs. Indirect effects on spotted frog would be greater at this site than any other alternative. *Species of Concern* There would be no direct impact on Leatherside chubs or their habitat. Indirect effects on Leatherside chub would be greater at this site than other alternatives. Indirect impacts would be minimal.	would require clearing of about 1.5 acres of riparian vegetation, causing fragmentation of the habitat available for the cuckoo. *Sensitive Species* No direct or indirect effects on Townsend's big-eared bat. No indirect effects on individual Bonneville cutthroat trout and no direct or indirect impact to overall Bonneville cutthroat trout populations in this drainage or on the Forest. No direct or indirect effects on Columbia spotted frog. *Species of Concern* No direct or indirect effects on Leatherside chub or their habitat from campground users. ***Wanrhodes*** *T&E Species* No direct or indirect effects on bald eagle. No direct or indirect effects on Western yellow-billed cuckoos. *Sensitive species* No direct or indirect effects on Townsend's big-eared bat.	

Table 2 Summary of Environmental Effects				
	Alternative 1 (No Action)	**Alternative 2**	**Alternative 3 (two or more sites)**	**Alternative 4 (Preferred Alternative)**
			No effects on Bonneville Cutthroat Trout. No affect on Columbia spotted frog. *Species of Concern* No direct effects on Leatherside chub habitat and minimal indirect effects. ***Monks Hollow*** *T&E Species* No direct effects to wintering bald eagles. Indirect effects possible from increased human presence. Less than 0.1 acres of potential cuckoo habitat impacted although no prior observations in this area. *Sensitive species* No direct effects Townsend's big-eared bats from construction. However, indirect effects to Townsend's big-eared bats greatest under this alternative. No direct effects to spotted frog or Bonneville cutthroat trout. *Species of Concern* No be direct effects on Leatherside chub habitat	

Table 2 Summary of Environmental Effects				
	Alternative 1 (No Action)	**Alternative 2**	**Alternative 3 (two or more sites)**	**Alternative 4 (Preferred Alternative)**
			and minimal indirect effects from campground users.	
Management Indicator Species	No direct, indirect or cumulative affects on Northern goshawk, Northern three-toed woodpecker, Bonneville cutthroat trout, and Colorado River cutthroat trout No direct effects on beaver. Indirect effects possible from increased human presence.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
Migratory Birds	Potential for direct effects on habitat due to increased loss of upland and riparian habitat from dispersed group recreational activities within the riparian corridor.	Temporary loss of upland habitat in the construction area footprint of approximately 25 acres. Permanent loss of 6 acres of upland habitat to be occupied by facilities. Very minor (< 0.1 acre) loss of riparian habitat. Indirect effects possible from increased human presence.	Temporary loss of upland habitat in the construction area footprint (*Brimhall* 3.07 acres, *Wanrhodes* 9.6 acres, *Monks Hollow* 13.65 acres). Permanent loss of upland habitat in area actually occupied by facilities (*Brimhall* 1.5 acres, *Wanrhodes* 1.7 acres, *Monks Hollow* 2.8 acres). Loss of riparian (*Brimhall* 0.44 acres, *Wanrhodes* 0.1 acres, *Monks Hollow* 0.1 acres). Indirect effects possible from increased human presence.	Temporary loss of upland habitat in the construction area footprint of approximately 19.34 acres. Permanent loss of 6.5 acres of habitat to be occupied by facilities. Loss of riparian habitat 0.44 acres. Indirect effects possible from increased human presence.
Species of Concern	No direct or indirect effects	No direct effects on leatherside chub or their habitat.	*Brimhall* No direct or indirect effects to leatherside chub or their habitat.	Same as described for the Monks Hollow site for alternative 3.

Table 2 Summary of Environmental Effects				
	Alternative 1 (No Action)	**Alternative 2**	**Alternative 3 (two or more sites)**	**Alternative 4 (Preferred Alternative)**
		Golden eagle nesting site located approximately 0.5 miles from the proposed campground. No direct or indirect effects.	Golden eagle nesting site is located approximately 0.6 miles from the proposed campground. No direct or indirect effects. *Wanrhodes* No direct or indirect effects on leatherside chub or golden eagles. *Monks Hollow* No direct effects on leatherside chub habitat and minimal indirect effects from campground users. Golden eagle nesting site located approximately 0.5 miles from the west end of the proposed campground. The nesting site is visually separated from the campground area and has not been has not been occupied since 2000. Last successful fledging 1997.	

Table 2 Summary of Environmental Effects				
	Alternative 1 (No Action)	**Alternative 2**	**Alternative 3 (two or more sites)**	**Alternative 4 (Preferred Alternative)**
CUP Wildlife Mitigation	No effects	No direct effects. Negligible indirect effects.	*Brimhall* No direct or indirect effects. *Wanrhodes* No direct or indirect effects. *Monks Hollow* No direct effects. Negligible indirect effects.	Same as described for Monks Hollow under Alternative 3 except proportionally higher with increased campground capacity at one location.
Recreation	Would not provide any additional developed camping opportunities and would not meet the commitments of the 1990 Diamond Fork System.	Would provide an additional 475 PAOT group-site camping capacity and would meet the commitments of the 1990 Diamond Fork System.	Same as Alternative 2	Same as Alternative 2

CHAPTER 4
RESPONSE TO COMMENTS

A Draft Environmental Assessment for group-site facilities was released in May 2003. The Forest Service also issued the Final Land and Resource Management Plan for the Uinta National Forest in May 2003. Since the Draft EA for the group-site campground was in production at the same time the 2003 Forest Plan was being finalized, it did not incorporate all planning direction provided in the 2003 Forest Plan. Therefore, it was determined the Draft EA should be revised to incorporate the standards and guidelines provided in the 2003 Forest Plan and be re-issued for public review. Five comment letters were received in response to the May 2003 Draft EA. Responses to these comment letters are provided below. Comment letters are on file with the Spanish Fork Ranger District.

LETTER NUMBERS	ISSUE # / SUMMARY	EXCERPTS FROM LETTERS
1	Concerned that the site is too remote.	"We prefer alternative 2 – Lower Diamond Fork, as the site for the group campground based on its accessibility and short distance from Hwy 6-89."
Response: Alternative 4 is most responsive to the purpose and need of the project (pages 1-4 and 1-5) and best addresses the significant issues (pages 2-3 to 2-5). The Alternative 4 location is only 5.5 miles from Alternative 2, which amounts to about 10 minutes additional drive time.		
2	Concerned that there is no overall management plan for Diamond Fork.	"This incredible increase in visitation supports the need for an overall management plan for the canyon."
Response: The 2003 Land and Resource Management Plan provides guidance for management of the Diamond Fork Area. Additionally, the Diamond Fork Area Assessment was finalized in September 2000 and identifies management opportunities and describes desired future conditions for Diamond Fork. The Diamond and Palmyra Campgrounds Reconstruction EA (1998) identifies a need to replace lost camping opportunities.		
2	The group camping site should be day-use only.	"Should we try to reduce the human impacts on the canyon by changing this to a day area for groups and individuals?" "Given the close proximity of the Orem-Provo area and even Salt Lake County, day use sites appear to be a much greater need than group campsites."
Response: The group-site facilities which were removed with the reconstruction of the Diamond Campground were one of the most popular sites on the Uinta Forest. Providing only day-use opportunities would not meet the purpose and need of the project (pages 1-4 to 1-5).		

2	PAOT numbers were not clear in the Executive Summary.	"It is not clear which numbers are correct."
Response: The PAOT numbers are clarified in the Pre-decisional EA.		
2,3	Concerned that impacts from large groups on the riparian area and water quality are not being addressed.	"There are areas close to the campgrounds that would be vulnerable to foot traffic and need to be protected from trampling", "Due to the large number of people… we remain concerned about indirect impacts to these habitats, such as twig cutting, compaction or erosion of the stream bank, degradation of water quality, and disturbance to resident and migratory wildlife."
Response: Approximately 0.44 acres of construction would occur in riparian areas. The preferred alternative would manage foot traffic by providing trails, a foot bridge and signs. Pages 2-4 to 2-6 of Chapter 2 describe Forest Plan Standards and Guidelines that will protect water quality during implementation of this project. Toilets will be installed for all action alternatives, protecting Diamond Fork Creek from coliform bacteria. Effects on riparian areas and water quality are addressed in detail in Chapter 3 starting on page 3-3 and 3-13 respectively.		
2	Concerned about streambed stabilization structures.	"Does the preferred alternative for this new campground contain similar stabilization structures?"
Response: The preferred alternative proposes no streambed stabilization structures.		
2,3	Concerned that there is minimal rationale for providing camping facilities on the south side of Diamond Fork Creek and concerned that the group site on the south side of the creek would cause fragmentation of vegetation and negatively effect wildlife.	"there is no explanation for the need for this additional impact", "disturbance (noise, activity) on both sides of the creek, thus completing the fragmentation of the riparian corridor at this location; potential constraints to the creek from footbridge (footings etc.), as well as a gap in riparian vegetation; construction and maintenance of a new road on the south side of the creek, thereby fragmenting and removing vegetation; and a permanent road crossing of Monks Hollow creek."
Response: Providing camping facilities on the south side of the creek would manage user density and provide a walk-in experience. There are no plans to provide motorized access to this site other than administrative maintenance. Replacing the existing low water crossing with a culvert would reduce existing impacts. The preferred alternative would directly affect 0.44 acres of riparian habitat and impacts to vegetation and wildlife are addressed in detail in Chapter 3 to accommodate the footbridge and Monks Hollow		

crossing.		
3,4,5	Concerned that construction of the group site at the preferred location would convert temporary impacts to permanent impacts.	"Construction of the group-site campground at the site will convert temporary impacts into permanent ones. These impacts need to be described and mitigated." "…building a campground on this site would be a permanent loss of winter range [for deer and elk]."
Response: The preferred site is located at the staging and spoil area for the Tanner Ridge Tunnel and Red Hollow Pipeline. Disturbance from the construction of these features has been significant. Over time portions of the site could be reclaimed but some permanent features will remain such as the Diamond Fork Creek Outlet. The site is also a very popular dispersed recreation area and impacts from these uses would be managed but continue to some degree. There are approximately 97,000 acres of National Forest System lands within the Diamond Fork watershed. Impacts to 19.3 acres amounts to less than 0.02 % of the area. Use of camping facilities is minimal during winter therefore indirect impacts would be primarily seasonal. Mitigation of these effects was discussed in the CUP Wildlife Mitigation section on page 3-38.		
3	Concerned that the wetlands are not protected.	"The document should describe what measures would be implemented to ensure that these wetlands will not be impacted by construction or use of the campground facility located there."
Response: Pages 2-4 to 2-6 of Chapter 2 describe Forest Plan Standards and Guidelines that will protect wetlands. Impacts to wetlands are addressed in Chapter 3, starting on page 3-3.		
3	Concerned that the AUM's should be reduced due to water being diverted to the group-sites.	"Please clarify whether the AUM's in the allotment will be reduced commensurate with the decrease in available stock water."
Response: The amount of water being diverted to the proposed group site (3.8 percent of flow) will not affect the amount of water available for livestock and therefore no reduction in permitted AUM's is necessary.		
3,4	Disagree with impacts to wildlife rationale.	"The section on Issues Addressed states that although impacts will occur to deer, elk and bird species, there is enough alternative habitat that they will disperse or relocate. We disagree." "Neo-tropical birds and other wildlife both deserve and require greater scrutiny within the cumulative effects analysis than the assumption they can simply go somewhere else during construction provides."

Response: Impacts to wildlife have been reanalyzed in accordance with the 2003 Forest Plan. Refer to Chapter 3 starting on page 3-18.		
3	Concerned that the golden eagles are not protected.	"the construction activities could disturb nesting golden eagles located near campsites. There is no discussion of monitoring or mitigation for loss of a golden eagle nest site."
Response: Impacts to golden eagles are discussed on page 3-36. The Red Mountain South territory, the closest territory to the preferred alternative, has not been occupied since 2000 (Keller, 2002). This territory has not had a successful fledgling since 1997. A chick was hatched in mid-April and fledged by late-June. If the project area becomes repopulated by golden eagles, the hatch and fledging would be over before most of the recreation use occurs. Construction would impact 0.44 acres of riparian habitat and would not occur until after mid-July to avoid fledging. Reconstruction of the Diamond and Palmyra campgrounds restored 2.7 acres of golden eagle habitat.		
3	Concerned that the EA does not mention revegetation and protection from grazing.	"The EA does not address how restored and revegetated areas will be protected from grazing impacts both during and after successful establishment."
Response: Pages 2-4 to 2-6 of Chapter 2 describe Forest Plan Standards and Guidelines that will protect disrupted areas from further disturbance. Page 2-15 states that the campground area, including disturbed areas, would be fenced to restrict cattle grazing		
3,5	Concerned that the bat gates on the Monks Hollow adits are insufficient to prevent disturbance from humans. Concerned that the bat use of riparian areas near the group sites was not addressed.	"Can human activities such as hiking and rappelling be directed away from the adits to minimize impacts?" "Other than the Townsend's big-eared bat, the document does not address how the presence of humans, light, and noise will affect bat use of the riparian areas."
Response: The gates installed on the Monks Hollow adits are sufficient to prevent people from entering the adits. The area around the mouth of the adits does not lend itself to hiking (dead end trail on steep cliff) but does offer limited rappelling opportunities. There are better rappelling opportunities within the area, so the risk from disturbance from rappelling is minimal. Other bat species were not discussed, as they are not on the MIS or PETS lists. Construction would occur on only 0.44 acres of riparian habitat. The majority of disturbance would occur outside of riparian areas. Campgrounds would have quiet hours between 10:00 pm and 6:00 am which would further reduce impacts.		
4	Concerned that impact to NMB species is not discussed.	"any other NMB species of concern are not discussed at all."
Response: Comment noted. Please refer to the revised text in Chapter 3, page 3-33.		
4	Concerned that soils and	"neither soils nor water quality is discussed

	water quality are not well enough addressed.	in detail within the EA." "The fact that the Diamond Fork River is on the state's 303(d) list should have made water quality and soils a driving issue…" "In the absence of TMDL standards, it is impossible to determine whether the impact of these proposed actions will further degrade the waters of Diamond Fork River."
Response: Page 2-4 to 2-6 of Chapter 2 discloses Forest Plan Standards and Guidelines that will protect soil and water quality with implementation of this project. Vault toilets will be installed for all action alternatives, protecting Diamond Fork Creek from coliform bacteria as described in Chapter 2. Impacts to water quality and soils are discussed in Chapter 3-13.		
4	Concerned that springs and riparian areas, where water is being taken out, be surveyed for spotted frogs and boreal toads.	"springs and riparian areas they support where water will be taken to support the campground may provide habitat for spotted frogs or boreal toads that has not yet been surveyed."
Response: The Utah Department of Wildlife Resources surveyed the Diamond Fork drainage for spotted frogs during the spring of 2003. Spotted frogs were only found from the small pond on the Childs Property to just below the Forest Service boundary, approximately 7 miles downstream of the proposed site.		
3	Concerned with locating recreation sites in riparian areas when non-riparian areas are available.	"We believe there are non-riparian areas where a group-site campground could be accommodated. However, they are not located in lower Diamond Fork."
Response: The purpose and need for the project (pages 1-1 to 1-5) identifies a need to replace sites in Diamond Fork that were eliminated by the reconstruction of the Diamond and Palmyra campgrounds and to also provide additional camping opportunities. Eleven different sites were considered during project analysis. The preferred alternative would directly impact 0.44 acres of riparian area. Indirect impacts would be mitigated by fencing, development of designated natural surface trails and through education and interpretation.		
4	Concerned about exceeding the carrying capacity of Diamond Fork.	"Citing a carrying capacity study completed for the Diamond Fork area in 1984, the EA claims "Diamond Fork" had "a capacity of 7,100 developed units." (EA, page 2-2). The UEC formally requests a copy of the 1984 Diamond Fork System analysis."
Response: The Forest Service has provided UEC with the requested document. The preferred alternative would provide 95 units accommodating 475 PAOT.		

4	Concerned about the cumulative effect of providing developed camping adjacent to a motorized trail trailhead.	"This will inevitably result in a huge increase in the number of ATV users recreating along the Monks Hollow Trail system." "All of this can have significant cumulative consequences for deer, elk and other wildlife."
Response: ATV use on Forest Lands has increased significantly in recent years. One strategy used by the Forest Service to manage and control ATV use is to provide designated riding areas such as the Monks Hollow trail. By providing designated ATV riding areas where the public can be directed helps diminish impacts from illegal ATV use in non-designated areas. See revised text on page 3-56.		
3	Concern that the EA does not adequately address impacts to upland, riparian and aquatic habitats.	"The EA should more specifically describe measures that will avoid, minimize, or compensate for impacts to upland, riparian and aquatic habitats."
Response: Please refer to page 3-207 of the July 1999 Final Supplement to the Final EIS for the Diamond Fork System. In summary, 109.7 acres of riparian and wetland habitat has been acquired and is federally controlled as mitigation for the impacts of the Diamond Fork System. A portion of this mitigation was in anticipation of the construction of Monks Hollow Dam and Reservoir which was abandoned. The 0.44 acre impact on riparian habitat resulting from the construction of recreation facilities, which are a feature of the Diamond Fork System, will be mitigated by prior federal acquisitions. Also, the impact needs to be considered from a broader context. The 1998 decision to reconstruct the Diamond/Palmyra campground resulted in a net increase in riparian habitat of 2.7 acres. This decision was made based on the understanding that the group-site campground would be relocated. The net impact of these two actions is a net increase in riparian habitat of 2.26 acres (please refer to your comment letter dated October 22, 1998). The developed camp sites will provide an alternative opportunity to some displaced users.		
3	Commenter questioned the discussion in the EA on the impacts of Tanner Ridge Tunnel on page 3.11 of the EA.	"It has been our understanding that rehabilitation of areas impacted by construction and removal of irrigation flows will result in both more and higher quality riparian habitat throughout the Diamond Fork and Sixth Water drainages."
Response: The commenter is correct and the text has been changed accordingly. Rehabilitation of areas impacted by construction and removal of irrigation flows will result in both more and higher quality riparian habitat		

A second Draft Environmental Assessment for group-site facilities was released in August 2004. Five more comment letters were received.

LETTER NUMBERS	ISSUE # / SUMMARY	EXCERPTS FROM LETTERS
6 (Kevin Brown, Utah Division of Drinking Water)	Concerned with State requirements and permitting for a new public drinking water system.	"Utah State drinking water rules have specific requirements for creating new public drinking water systems..."
Response: Comment noted. Should one of the action alternatives be selected by the responsible official, consultation with the appropriate State agencies will commence.		
7 (John Harja Utah Resource Development Coordinating Committee)	Concerned that the campground should be constructed using State BMPs.	"The proposed campground should be planned and constructed implementing best management practices to prevent erosion and to sustain both woody and leafy vegetation."
Response: Comment Noted**.** Both construction and post-construction BMPs to reduce erosion and improve vegetative establishment were incorporated into the final document, Appendix 1.		
7	Concerned that flush toilets would require an extensive treatment system and therefore pit toilets would be more feasible.	"It may be found to be more appropriate both economically and environmentally to utilize pit toilets..."
Response: Comment noted. The flush toilets were removed from the proposed action and replaced with sealed vault toilets in each of the alternatives.		
8 (Kiran Bhayani, Utah DEQ, Water Quality Board)	Concerned that public drinking water systems and waste water disposal systems must comply with applicable State procedures and regulations.	"Waste water disposal… must comply with the Water Quality Rule." "Please contact the Division of Drinking Water for approvals…"
Response: Comment noted. Should one of the action alternatives be selected by the responsible official, consultation with the appropriate State agencies will commence.		
9 (Mary Henry, USFWS)	Concerned with impacts to riparian habitat.	"The preferred alternative would create a permanent discontinuity of riparian habitat…Other alternatives would either fragment existing habitat or prevent restoration of habitat..."
Response: Impacts to the riparian forest from the preferred alternative will remove less than one acre of habitat. This will cause minor habitat fragmentation that could potentially prevent the Western yellow-billed cuckoo from occupying this area, as well as remove nesting habitat for neo-tropical migratory birds.		
9	Believe that other locations	"We continue to believe there are non-

LETTER NUMBERS	ISSUE # / SUMMARY	EXCERPTS FROM LETTERS
	are available that would result in fewer impacts to riparian habitats.	riparian areas where a group-site could be accommodated."
Response: Chapter 1 of the EA describes the underlying need for the project which is to provide group-site camping in Diamond Fork to replace those lost during the re-construction of Diamond Campground and to provide additional group-site camping opportunities to meet a portion of the increased demand for this type of activity. In addition, providing group-site camping in Diamond Fork will provide alternative opportunities for group users displaced by the closure of dispersed camping in the lower 7.5 miles of Diamond Fork Canyon. Locating the group-site campground out of Diamond Fork Canyon does not meet the purpose and need for the project. Numerous alternative locations were considered but dropped from detailed analysis as described in Chapter 2 of the EA.		
9	Concerned with indirect impacts to riparian habitat, stream bank stability and water quality.	"…due to the large number of people that will use the Alternative 4 site, we remain concerned with indirect impacts to the riparian habitat, stream bank stability and water quality."
Response: Comment Noted. The incorporation of designated trails for visitor stream access is discussed in Chapter 3. Proper trail design, signing, education, and utilization of construction BMPs will minimize potential impacts to riparian habitat, streambank stability, and water quality.		
9	Opposed to providing facilities south of Diamond Fork Creek.	"The major potential impacts to riparian and aquatic habitats of the preferred alternative result from the… facilities planned for the south side of Diamond Fork Creek."
Response: Comment noted, these effects are disclosed in the effects analysis.		
9	Concerned that the project is not consistent with 2003 Forest Plan direction.	"…guidance from the 2003 Forest Plan states: - New recreation facilities should be located outside the RHCAs (riparian habitat conservation area)… We do not believe that the currently proposed group-site campground is in conformance with that guidance."
Response: The Forest Plan excerpt is taken from Rec. -2 on page 3-29. This is a recreation management guideline rather than a standard. This guideline goes on to state "an exception may be made if adverse effects to native aquatic organisms are avoided or adequately mitigated." The mitigation measures that are to be implemented are discussed		

LETTER NUMBERS	ISSUE # / SUMMARY	EXCERPTS FROM LETTERS
in Chapter 2.		
9	Concur with effects analysis determinations for Alternative 4 for endangered, threatened and sensitive animals and plants.	"We concur..."
Response: Comment noted.		
9	Concerned that the document does not discuss actions that would be taken if beavers move into the campground and cut trees and dam the creek.	"The document should discuss actions that the Forest Service would take if beavers move into the campground area and cut trees and dam the creek."
Response: There is a potential that beavers could move into the area and dam the creek. However, the creek around the preferred alternative has sections that are largely incised throughout this area. The best places for dam building are upstream of the proposed site.		
9	Concerned that the document does not discuss big game or mitgratory birds other than sensitive species.	"This section does not discuss big game… or migratory birds other than sensitive species."
Response: This document does discuss neo-tropical migratory bird species. The previous document did discuss big game species, which were, at that time under the 1984 Forest Plan, a management indicator species. The current EA does not discuss big game as they are not a MIS species for the 2003 Forest Plan.		
9	Concerned that some species of concern were not addressed.	"Additional species of concern include yellow sweetclover, smooth brome, and reed canarygrass."
Response: These three species are non-natives, and at one time were deliberately planted on the Uinta N. F. While they are not considered noxious weeds or highly undesirable, they are no longer encouraged to be planted, by Forest Service policy. Therefore, the above named species are not "species of concern".		
9	Concerned that the analysis is unclear.	"Please explain why for the Monks Hollow site Alternative 4 development would be more concentrated east to west than in Alternative 3, with somewhat less construction on the existing fill area and more in relatively natural vegetation." (Page 3-39).
Response: Alternative 3 site configuration for Monks Hollow would place facilities on the North side of the Diamond Fork Creek where the existing fill area is located and would accommodate 275 PAOT's. Alternative 4 would have all the facilities at the		

LETTER NUMBERS	ISSUE # / SUMMARY	EXCERPTS FROM LETTERS
Monks Hollow site. These facilities would be located on both sides of the Diamond Fork Creek and accommodate 475 PAOT's. Alternative 4 would have facilities constructed at the existing fill area as well as relatively natural vegetation areas.		
9	Concerned that the analysis is unclear.	"Please explain what measures would be taken to protect the small spring if the walk-in campground is not deleted from Alternative 4. The document implies that actions proposed will be insufficient to prevent its degradation by playing children." (Page 3-40).
Response: The most likely protective measures are signing, fencing, and planting of barrier vegetation. Barrier vegetation could mean shrubs or other native vegetation. The analysis noted that, if needed and implemented, such protective measures were likely to keep damaging activities within acceptable levels.		
9	Concerned that the analysis is unclear.	"Please explain more clearly your calculation of only 0.44 acres of riparian habitat affected by Alternative 4. Based on several site visits, it appears to us that much of the area could be successfully replanted to riparian vegetation…"
Response: The estimated impact of 0.44 acres on riparian vegetation was calculated using a GIS spatial anlaysis, overlaying the construction area footprint on riparian habitat mapping. Approximately 0.1 acres of the impact is associated with the walk-in footbridge and 0.34 acres is associated with the administrative access road that would be used to construct and service the 75 PAOT walk-in site on the south side of the stream. Other than these impacts, the construction area footprint is outside the mapped riparian area and 100-year flooplain. These areas have been historically and currently occupied by upland vegetation (juniper, sagebrush, etc.) and are not conducive to the establishment of riparian vegetation. There are no present plans to replant riparian vegetation outside the 100-year floodplain other than those efforts associated with the reclamation of the Red Hollow Pipeline staging area. These reclamation efforts are primarily located outside the 100-year flooplain as well.		
9	Concerned with analysis of Ute ladies'-tresses.	"As we have no information on populations of Ute ladies'-tresses prior to the trans-basin diversion or irrigation water, there is no basis for stating that the diversion had the "greatest effect". Therefore, statements of cause and effect regarding population size are speculative."
Response: Thank you for your comment.		
9	Supports Alternative 4 over the other alternatives.	"Of the available alternatives, we believe that Alternative 4 is the least damaging..

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		while fulfilling the recreation mitigation obligation."
Response: Comment noted.		
10 (Kevin Mueller, Utah Environmental Congress)	Concerned that analyzing this project and the Monks Hollow ATV Trail project separately is inconsistent with NEPA and that the projects should be analyzed together in an EIS.	"This proposed reconstruction of the campground at the Monks Hollow ATV trailhead and the proposed expansion of the Monks Hollow ATV trail network should be combined in one EIS."
Response: The cumulative effects analysis in Chapter 4 of this EA describes the potential effects of the proposed expansion of the Monks Hollow ATV trail network. The purpose and need for the Monks Hollow ATV trail proposal, being analyzed in a separate NEPA document, is to improve motorized trail riding opportunities in the Diamond Fork Management Area as described in the 2003 Forest Plan. The group-site campground decision was a result of a 1998 decision to remove the group-site facilities from the Diamond Fork Campground in an effort to minimize impacts on riparian habitats. That decision was made based on the commitment to relocate the group-site campground, and when take together with the Proposed Action, will result in a net increase in riparian habitat. The Monks Hollow ATV trail proposal and the Group-site campground decisions are not contingent upon one another and are not connected actions. Therefore the proposals are being analyzed in separate documents, and separate decisions will be issued.		
10	Concerned that the adverse effects to TES species, soil, riparian and aquatic resources may not be significantly mitigated.	"UEC is concerned that adverse effects to TES species, soil, riparian and aquatic resources from the proposed action may not be able to be significantly mitigated."
Response: The project footprint was designed to minimize impact to riparian resources by placing facilities above the 100 year floodplain and/or riparian areas. Impact of each of the alternatives is summarized in Chapter 3 - Table 2. Project design, implementation, and mitigation (implementation BMP's) are sufficient to protect aquatic resources within the project area and watershed downstream of the project site. There will be no direct effects to aquatic species or their habitat and only minor indirect effects resulting from increased public activity in the area adjacent to the proposed campground as discussed in the EA. The bald eagle and Western yellow-billed cuckoo would have minimal direct impacts from loss of riparian habitat (less than 0.1 acrea) under the preferred alternative, although neither species have been seen at that location. This is not enough loss of riparian habitat to cause habitat fragmentation. Indirect effects to these species are a result of human		

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disturbance in the area. Noise levels associated with ATV and snowmobile operations may temporarily displace eagles from foraging in the area. There will be no long term effect as the eagles will use the area when the disturbance is not present. While the effects to the bald eagle are minimal (since they are only winter residents), the cuckoo may never occupy the area due to the human disturbance of contruction and operation of a 475 PAOT campground. The Townsend's big-eared bat could potentially have indirect effects from having a 475 PAOT campground in close proximity. The bat population in the south adit is extremely hard to access due to the steepness of the terrain and lack of trail going to the adit. However, the recruitment adit can be accessed from a rough trail from the Monks Hollow Trailhead. Having people camping at the Monks Hollow trailhead, instead of just using the trailhead as an access point for ATV travel, could lead to more trail "exploration". Since these bats are very sensitive to human disturbance, an excess of activity around the mouth of the adit could prevent the bats from migrating into the adit. The only TES plant in either the project area or the cumulative effects area is the Ute Ladies'-tresses orchid. No population of this species would be directly impacted. The U. S. Fish and Wildlife Service has concurred with our determination that this project as currently designed may affect, but is not likely to adversely affect the species.		
10	Concerned that Ute ladies'-tresses surveys are out of date.	"Ute ladies'-tresses surveys that are relied upon in the EA (dated 1997) are out of date, and were conducted before the massive CUP construction was completed."
Response: We have updated the Ute ladies'-tresses discussion with population information through 2003, sent to us in June 2004.		
10	Concerned that Clay Phacelia habitat and populations will be impacted.	"There are Clay Phacelia habitat and populations in the project area that will be impacted by the proposed action…"
Response: Surveys we have conducted for other projects in the Diamond Fork watershed have never revealed clay phacelia plants. We have found some potentially suitable habitat for this species in the upper elevations of the watershed, miles away and upstream of the Group Campground project, but it appears unoccupied. The U. S. Fish and Wildlife Service has concurred with us in this assessment.		
10	Concerned that the project will contribute to the spread of invasive exotics such as cheat grass.	"The construction (and subsequent increased recreational use) will increase the frequency of introductions of invasive exotics…"
Response: Thank you for your comment. We discussed the existing load of noxious weeds and undesirable alien plants, and the potential for project-related weed introductions, in the environmental analysis. We believe the weed-related project		

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mitigations combined with the Ranger District's ongoing weed control efforts will keep such weeds from establishing.		

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10	Concerned with impacts to pollinators and their habitat.	"Effects from construction activities associated with the proposed facilities (and subsequent increased use) will impact pollinators and their habitat."
Response: "Pollinators" is an indefinite and broad noun, meaning any and all of bees, wasps, ants, butterflies and moths, other insects, bats, birds, water and the wind, as they relate to facilitating the fertilization of plant seeds or spores. The group campground project will result in facility construction that will "pave over" varying and relatively small areas of land, estimated at about three acres in scattered parcels. Human activities in the boundaries of the campground will affect to a lesser extent another 17 to 25 acres, by trampling and other effects. A new campground is most likely to adversely affect ground nesting insects within the campground boundaries, probably ruling out their nesting in about 10 or so acres of the 20 acres involved. There would be much less impact to species nesting in bushes or trees. There would be a reduction of flowering plant biomass over three to ten acres within the campground boundaries. This is a very small reduction considering the size of the watershed. Of the plants we are aware of in the Diamond Fork watershed, the species most likely to have population viability threatened by a decline in its particular pollinators is the Ute Ladies'-tresses orchid, which is pollinated by several native and introduced species of bees in the Diamond Fork watershed (Sipes and Tepedino, 1996, pp. 15-16). These bee species have differing habitat needs and lifeways. Some nest in the ground, others in tree boles, others in hollow twigs. Some are susceptible to introduced parasitic mites, others not greatly so. Most species of bees are known to fly half a mile or more to utilize favored species. The bee-preferred species of plants found in Diamond Fork watershed include many species both native and non-native, and many of these species thrive in disturbed conditions (Sipes and Tepedino 1996 pp. 32-33). The U. S. Fish and Wildlife Service has concurred with our determination that this project as currently designed may affect, but is not likely to adversely affect the Ute Ladies-tresses orchid.		
10	Concerned that the Forest Service is not working to improve habitat for Bald eagle and Western Yellow-billed Cuckoo.	"…the proposed action (and alternatives) should be modified such that they work to actively improve the habitat for these protected species, and not just mitigate additional effects..."
Response: Bald eagles are winter migrants and can be found along Diamond Fork Creek from late fall to early spring. They have been mostly observed foraging from Highway 6 to the Diamond Campground, and roosting in the Brimhall area. The future restoration of the Diamond Fork Creek to correct damage done to the banks from high irrigation flows		

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will improve the foraging habitat for the eagles. There is sufficient habitat Western yellow-billed cuckoo to use the upper Diamond Fork Creek, though they have never been observed there.		
10	Concerned that the EA does not include maps clearly defining project area and cumulative effects area boundaries.	"The Forest needs to include maps in the EA/EIS that identify the specific project area boundary, as well as the Cumulative Effects Area (CEA) boundaries for all resources…"
Response: A new map has been included in the Final EA identifying the Cumulative Effects Area which is the Diamond Fork watershed.		
10	Concerned that the analysis ignores that lynx are using the Uinta National Forest and may use the project area in the future.	"It is therefore arbitrary or premature to conclude that there will be no effects to dispersing lynx or their habitat."
Response: The Canada lynx is dependent on the snowshoe hare as its primary prey. There is no known habitat for the snowshoe hare to exist in the Diamond Fork watershed. The determination for the lynx received concurrence from the USDI Fish and Wildlife Service on October 8, 2004. A copy of this letter is included in the project file.		
10	Concerned that a BO should be prepared for Threatened and Endangered species.	"A BO and additional analysis of the effects to Threatened/Endangered species and their habitat should be included."
Response: Consultation with the USDI Fish and Wildlife Service was addressed through several field trips and a biological assessment. Concurrence for the findings were received October 8, 2004.		
10	Concerned with effects to June sucker and Utah Valvata snail.	"Original surveys… should be conducted…effects, including cumulative effects, may impact these listed species..."
Response: June sucker occur only in Utah Lake with limited spawning occurring in the mouth of lake's tributaries. There is no present or historical occurrence of the species in Diamond Fork Creek and therefore no direct, indirect or cumulative impacts on the species. Similarly, Valvata snail is considered extirpated in Utah. Consequently, there will be no direct, indirect or cumulative impacts on the species.		
10	Concerned with effects to Bonneville cutthroat trout, Columbia spotted frog and leatherside chub.	"The UEC is concerned that the effects… will be significant on the habitat and/or populations of Bonneville cutthroat trout, Columbia spotted frogs and leatherside chub. Current, project level population and habitat monitoring data needs to be added to this environmental assessment..."
Response: There will be no direct effects to aquatic species or their habitat and only		

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minor indirect effects resulting from increased public activity in the area adjacent to the proposed campground as discussed in the EA. Current population and habitat monitoring data are included in the EA.		
10	Concerned that the project will spread whirling disease.	"ATV's, cars, trucks, and RV's are known to carry dried mud infected with whirling disease..."
Response: Although ATV's, cars, trucks, and RV's can carry mud infected with the spores of *Myxobolus cerebralis* the viability of these spores following transport can be highly variable. Because of this, a determination of "risk" of introducing or spreading whirling disease in the project area by this method would be highly speculative. The only way to prevent the introduction or spread of whirling disease into the watershed through vehicle carried mud would be to close the entire drainage to public access.		
10	Concerned that the cumulative effects analysis is inadequate.	"These sections of the EA omit many past, present and reasonably foreseeable activities, projects and other impacts. The explanation of the effects of the impacts and projects that are listed is also inadequate..."
Response: The Cumulative Effects section of the EA has been revised to include all past, present and reasonably foreseeable actions that, when considered with the Proposed Action or alternatives, these actions may contribute to cumulative impacts.		
10	Concerned that BCT, three toed woodpecker, goshawk, and beaver MIS exist or have habitat in the project area and that hard population trend data is not presented or analyzed.	"The EA needs to present the established hard population trend data… there are populations and habitat for all of these MIS in the project area and in the cumulative effects area…"
Response: Comment noted. Existing habitat and population data for Management Indicator Species have been analyzed and summarized in the EA starting on page 3-30.		
10	Concerned that the effect to water quality receives inadequate analysis.	"Effects to water quality…does not receive adequate analysis."
Response: Comment noted. The effects of the project on water quality and watershed resources is discussed in Chapter 3, Pages 3-13 – 3-17.		
10	Concerned that the project will result in indirect take of migratory bird resources.	"…the proposed action… will result in indirect take of migratory bird resources including nests, eggs, and young."
Response: Construction of the campground will not begin until mid to late July, when most of the migratory birds have fledged their young.		
10	Concerned that the Forest has not developed a Memorandum of	"We remind the Forest that you have been instructed to "develop and implement a Memorandum of Understanding (MOU)

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	Understanding with the Fish and Wildlife Service as directed by EO 13186.	with the Fish and Wildlife Service (Service) that shall promote the conservation of migratory bird populations." (EO 13186 3)."
Response: The Migratory Bird Treaty Act provides for the management of neo-tropical migratory birds (NTMB). EO 13186 directs agencies to support the conservation intent of the migratory bird conventions to migratory birds by analyzing, avoiding and mitigating adverse effects to migratory bird resources. NTMB surveys are covered in Chapter 3 on the EA. Mitigation for the NTMB is to delay construction activities until mid-July to give the birds time to fledge their young. The MOU between the Forest Service and FWS is still in situ and will be issued at an agency/national level. The Forest is not responsible for the MOU.		
10	Request development of alternatives that do not increase the maximum PAOT in the Diamond Fork area, minimize impacts from existing sites, confine impacts within the existing footprint of existing sites, and do not include fees.	"The UEC asks the Forest to explore…alternatives that do not increase the maximum PAOT in the Diamond Fork area, but work to explore options that minimize current impacts from existing sites, and confine recreational impacts to within the existing footprint of these sites. We would also like the Forest to explore alternatives that do not include recreation fee demonstration and/or other additional recreation fee sites in the Diamond Fork area.
Response: The Proposed Action is in the result of an effort to minimize the footprint of developed recreation in Diamond Fork as you have suggested. The 1990 Final Supplement to the Final Environmental Impact Statement for the Diamond Fork System and the 1988 Definite Plan Report for the Bonneville Unit of the Central Utah Project included, among other things, the commitment to construct recreation facilities as part of the Diamond Fork System. The recreation features included the construction of day use areas, trail-head improvements and a new 96-unit campground at Red Ledges in Diamond Fork. Rather than constructing the new 96-unit campground at Red Ledges, a decision was made to re-construct the existing Diamond Palmyra campground at its existing location, thereby minimizing the footprint of constructed recreation in Diamond Fork. This decision was implemented by conducting an environmental analysis of re-constructing the Diamond Campground. The environmental analysis resulted in a decision to re-construct the campground, yet reduce the capacity by approximately 33 percent by removing the group-site facilities and single family units that were located in the active floodplain. The group-site sites and single family camp units in the active flooplain were removed in order to restore riparian habitats and to facilitate stream restoration efforts. This decision was made based on the commitment to re-locate the		

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group-site facilities in another more appropriate location. When considered together, the re-construction of camp Diamond and the construction of the group-site campground, will result in a net increase in riparian habitat of approximately 2.26 acres. The proposed action is not intended, nor does it have as its goal, the maximization of PAOT's in Diamond Fork. The Forest Service considered 11 alternatives, with 4 in detail. The Forest Service has analyzed dispersed camping and other management activities in Diamond Fork to minimize the current impacts from recreation, including restricting dispersed day and overnight use to appropriate areas (Decision Memo for the Dispersed Recreation Site Improvement project of 5/22/02 and the Decision Mem0 for the Dry Canyon Recreation Site Improvement project of 9/20/02. One of the underlying reasons for this project was the removal of 330 PAOT's of group camping from the Diamond and Palmyra campgrounds (see Decision Notice – FONSI Fall of 1998) to reduce impacts to riparian habitats and to relocate this capacity, plus some, at a more appropriate location in the Diamond Fork drainage. The driving issues recognized the need to minimize impacts to riparian watershed and critical (threatened) plant species. Fee demo participation is outside the scope of this analysis.		

CHAPTER 5
CONSULTATION AND COORDINATION

Consultation and coordination with the following organizations was conducted as part of the environmental planning process:

Central Utah Water Conservancy District
Northern Ute Indian Tribe
U.S. Bureau of Reclamation
U.S. Fish and Wildlife Service
U.S. Forest Service
Utah Division of Wildlife Resources
Utah Reclamation Mitigation and Conservation Commission
Utah State Historic Preservation Office

In January 2000, a scoping letter was sent to the public describing the proposed action and requesting comments from interested parties. The letter containing maps, a description of the proposed action, and the purpose and need for action was mailed to 201 individuals and organizations. Additionally, an article appeared in the *Provo Daily Herald* on February 6, 2000, and the *Spanish Fork Press* on February 9, 2000. The formal, written scoping comment period closed February 18, 2000. A Draft Environmental Assessment for group-site facilities was released in May 2003. Five comment letters were received in response to the May 2003 Draft EA. In response to changes in the Forest Plan that was finalized in 2003 and comment letters received on the May 2003 Draft EA, a revised Draft EA was reissued in August 2004. Five comment letters were received in response to the August 2004 Draft EA. Notice of the availability of the Draft EA's were published in local papers and the Federal Register.

Appendix 1

BEST MANAGEMENT PRACTICES

SELCECTED BEST MANAGEMENT PRACTICES (BMPs) FOR HYDROLOGIC MODIFICATIONS - The following is a partial list of BMPs from the 1995 *"State of Utah, Nonpoint Source Management Plan for* 1995 *"State of Utah, Nonpoint Source Management Plan for Hydrologic Modification"* addendum to the 1988 *"Utah Nonpoint Source Management Plan"*. Only BMPs which describe how the land and aquatic resources are to be managed are listed below. BMPs listed in the *"Nonpoint Source Management Plan for Hydrologic Modifications"* which are administrative in nature (i.e. they describe environmental analysis, training, coordination, consultation, permitting, professional qualifications, and similar requirements) and explanatory items are not listed below. In addition, BMPs which are redundant with Forest-wide standards and guidelines and those redundant with BMPs listed in part 2 of this appendix (BMPs for Silvicultural Activities) are not listed below.

BMPs to Control Construction Activities In Or Adjacent to Surface Water:

(1) Minimize disturbance in the channel by conducting only essential access and work in the stream area. Conduct staging activities, material/equipment storage well away from the stream. Use physical markers to delineate the area to be disturbed.

(2) Minimize the length of time that stream specific construction occurs. Consolidate channel work and complete the installation without interruption. Avoid conducting concurrent site activities that may delay channel work and increase exposure time of disturbance.

(3) Conduct the construction activity in phases. Avoid area-wide clearance of the construction site. Disturb areas in small parcels and stabilize them before proceeding with the next phase.

(4) Ensure that all needed materials, manpower, and equipment are available on-site prior to initiating any disturbance in the stream channel/floodplain and tributaries.

(5) Dispose of excess material out of the stream channel/floodplain.

(6) Prevent wet cement from entering the water. Ensure that all concrete used during construction is set before allowing contact with stream flow. Wash equipment used during concrete work at least 300 feet from perennial streams and 150 feet away from intermittent streams and out of the riparian area, wetland and floodplain. *(adopted to incorporate INFISH distances)*

(7) Minimize stream fords for equipment. Stream bed alteration for fords should not be done. Limit crossing frequency to absolutely essential trips.

(8) Do not conduct work below existing water level, except for essential footings or culvert beds. If the project involves excessive disturbance below the water level, use coffer dams and divert flows if possible.

(9) Control runoff from disturbed areas using temporary ditches, berms, catch basins, and pitting.

(10) Install temporary sediment control measures prior to initiating construction in the stream channel/floodplain.

BMPs for Site Preparation, Regeneration and Revegetation

(1) General Guidance:
   (a) Reduce the opportunity for invasion of noxious weeds by revegetating with appropriate seed.
   (b) Install water diversion devices where needed to limit the erosion potential.

(2) Site Preparation
   (a) Ensure slash disposal and treatment to prepare site for regeneration.
   (b) Scarify soil only to the amount required by the species desired for regeneration.
   (c) Consider chemical site preparation instead of mechanical site preparation where possible to reduce soil disturbance.

(3) Regeneration
   (a) Retain stocking levels suited to necessary site moisture conditions.
   (b) Plant proper species for soil and site conditions when using artificial regeneration.
   (c) Use local seed source stock during artificial regeneration projects where possible.

(4) Revegetation
   (a) Stabilize exposed soil (including fire lines) with proper seed mixtures for soil and site conditions.
   (b) Following removal of temporary culverts and bridges, establish earth or straw dikes on stream banks and seed with proper seed mixtures.
   (c) Utilize a native herbaceous seed mixture suited to site conditions.
   (d) Avoid seeding herbaceous vegetation where tree seedling establishment is desired unless erosive conditions warrant. Slash may be used to reduce erosiveness.

BMPs for Riparian/Floodplain Modification:

(1) It is necessary to protect water quality and beneficial uses during these activities as well as during the placement, operation, and maintenance of materials, equipment and structures associated with these activities. Apply the Measures to Control Construction Activities BMP with construction activities or modifications in riparian or floodplain areas. Persons implementing these activities remain responsible for adhering to applicable laws, rules and regulations.

(2) Access of a stream to it's floodplain should not be restricted unless it is determined that the loss of appropriate stream function and the associated values is warranted and unless substantial stabilization and other measures to mitigate losses to the system are implemented.

(3) Structural measures, such as fences or barriers, may be used to facilitate proper protection and use of streamside areas. These must be maintained to function properly.

(4) Measures and practices should be selected to achieve riparian modifications that:

a. are visually pleasing;

b. provide fish and wildlife habitat;

c. allow floodplains and riparian areas to function properly.

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allotment (grazing)
An area designated for the use of a certain number and kind of livestock for a prescribed period of time.

alternative
One of a number of possible options for responding to the purpose and need for action.

cumulative effects
Impacts on the environment that result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

dispersed recreation
Recreation that occurs outside a developed setting (e.g., hunting, scenic driving, or backpacking).

disturbance
Any event that alters the *structure*, *composition*, or function of an *ecosystem*, including grazing, human trampling, logging, foraging by wildlife, wind, flood, insects, disease, and fire.

ecosystem
A unit that consists of living and non-living parts, interacting to form a stable system.

endangered species
Designated by the U.S. Fish and Wildlife Service, an animal or plant that has been given federal protection status because it is in danger of extinction throughout all or a significant portion of its natural range.

forage
Plant material (usually grasses, *forbs*, and brush) that is available for animal consumption.

forbs
Broadleaf ground vegetation with little or no woody material.

Management Indicator Species (MIS)

Representative species whose *habitat* conditions and *population* changes are used to assess the impacts of management activities on similar species in a particular area.

mitigation
Actions that avoid, minimize, reduce, eliminate, or rectify impacts from management practices.

no action alternative
The most likely condition expected to exist if current management practices continue unchanged. The analysis of this *alternative* is required for federal actions under NEPA.

objective
A concise time-specific statement of measurable planned results that move toward pre-established goals. An objective helps define the precise steps to be taken and the resources to be used in achieving identified goals.

overstory
In a forest with multiple layers of vegetation, the portion of the trees forming the uppermost (canopy) layer.

PAOT
Maximum people at one time. For this analysis a PAOT was calculated using five people per single site and ten people per double site.

riparian
Related to, living, or located in conjunction with a wetland, on the bank of a river or stream, or at the edge of a lake or tidewater

Roadless Area
An area without any improved roads maintained for travel by standard passenger type vehicles.

scoping
The process the Forest Service uses to determine, through public involvement, the range of issues that the planning process should address.

sensitive species
A term to describe selected plant and animal species for which *population* viability is a concern, as evidenced by significant current or predicted downward trends in *population* numbers or density, and significant current or predicted downward trends in habitat *capability* that would reduce a species' existing distribution. Sensitive species are not covered in the Endangered Species Act.

seral
Relating to ecological communities where all *successional* stages of *biotic* development are represented.

stand
A contiguous group of trees sufficiently uniform in *age class* distribution, *composition*, and *structure*, and growing on a site of sufficiently uniform quality to be a distinguishable unit.

structure
The age and size of the vegetation type in a subject area.

succession
The replacement in time of one plant community with another. The prior plant community (or successional stage) creates conditions that are favorable for the establishment of the next community.

Threatened species
A designation by the U.S. Fish and Wildlife Service when a plant or animal species is likely to become *endangered* throughout all or a specific portion of its range within the foreseeable future.

watershed
A land area that contributes all its water to one drainage system, stream, or river.