

# DIAMOND FORK GROUP-SITE CAMPGROUND

## DRAFT ENVIRONMENTAL ASSESSMENT

July 2004



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Spanish Fork Ranger District, Uinta National Forest

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 south east 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

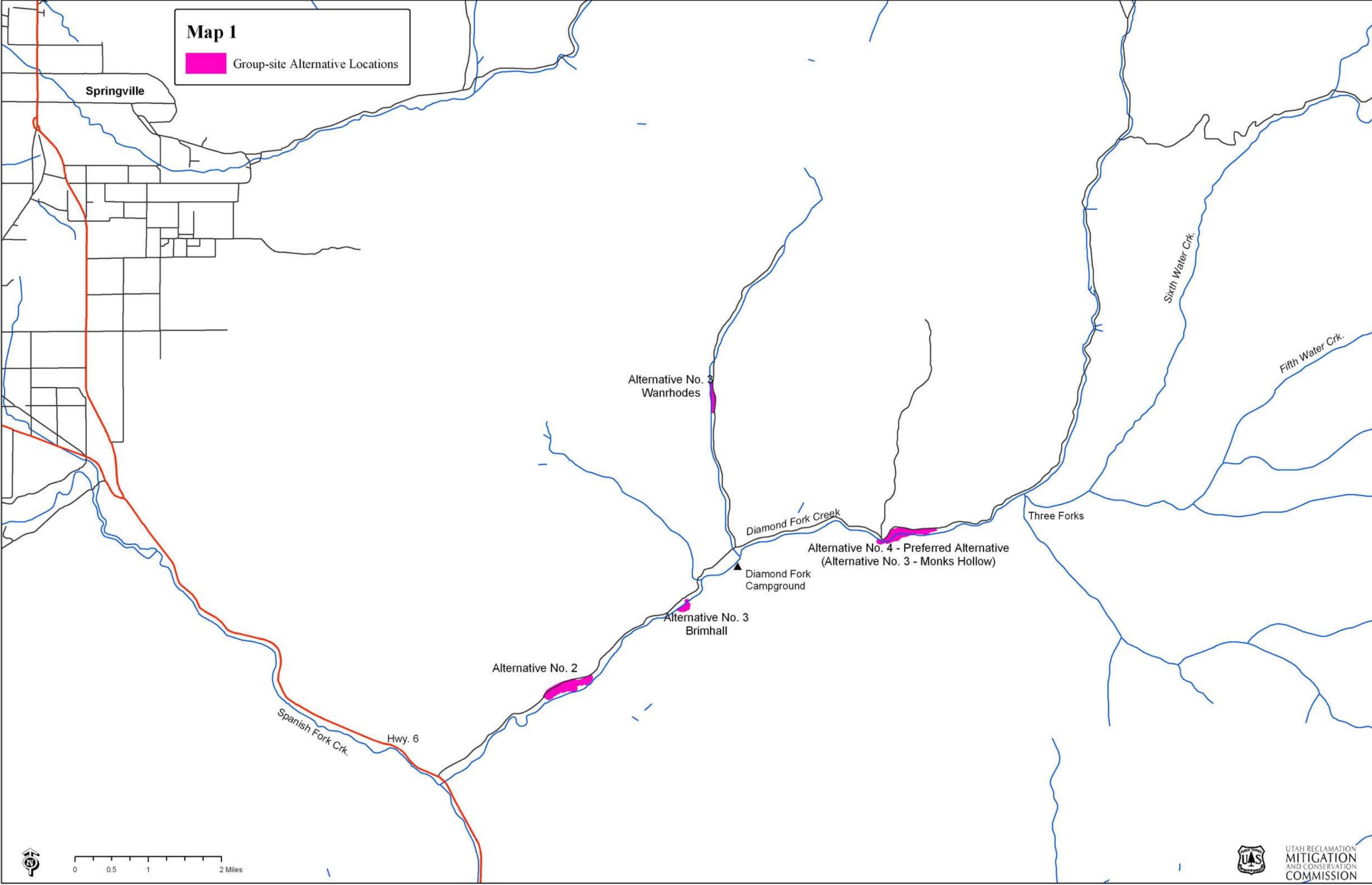
Federal reclamation projects have impacted the Diamond Fork watershed for many years. As early as 1906, construction began on the Strawberry Valley Project that captured water from the Uinta Basin and transported it for irrigation use in the Bonneville Basin via Diamond Fork. In 1956, Congress authorized the construction of the Central Utah Project (CUP). The Diamond Fork System, a component of 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 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**

 Group-site Alternative Locations





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.<sup>1</sup> 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.<sup>2</sup> 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.

“Diverse and suitable recreational opportunities are provided responsive to public demand while maintaining ecosystem health and contributing to social and economic sustainability.”

“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.”

“By 2010, reconstruct Timpooneke, Lodgepole, and Little Mill Campgrounds, and the Diamond Fork group sites.”

Additionally, on 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.

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<sup>1</sup> A group-site campground is a facility that will accommodate large groups ranging in size from 25 Persons At One Time to 100 PAOT.

<sup>2</sup> 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.

## **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.

### **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 picnicking 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)<sup>3</sup> 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.

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<sup>3</sup> 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.

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

## **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 (or flush toilets if the water source allows), 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 Proposed Action 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 (IDCA 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 identify the location, size and type of group-site campground that would be constructed in Diamond Fork to replace group-site facilities removed from the Diamond/Palmyra Campgrounds and that would provide additional outdoor recreation opportunities for the public. 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 Alternatives located at the end of this chapter.

### **SCOPING AND PUBLIC INVOLVEMENT**

An IDCA 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 units. 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.<sup>1</sup> 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 direction given 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 effects 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

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<sup>1</sup> 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  $475 \text{ PAOT} / 5\text{PAOT} = 95$  equivalent units.

390 PAOT, a reduction of 190 PAOT. This was done by removing the group-site 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.

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. 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 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 (*Oncorhynchus 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, riparian 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).
- 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). 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, 1993, 1994, and 1996 show more than 75 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 6,000 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 big game winter range, other wildlife impacts, visual 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 level ground is required 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 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 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 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 in Diamond Fork. 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 in Diamond Fork. In addition the site is in a roadless area which is currently under a moratorium for new road construction.

**Sawmill Hollow.** Sawmill Hollow had a number of issues that eliminated the site from detailed consideration. Construction at the site would require an unacceptable level of impact on riparian resources, the size of the location was too small, soil stability was a concern, access would need to be improved for safety reasons and the site is located in a flood zone.

**Lower Diamond Fork Mitigation Property.** The Lower Diamond Fork Mitigation Property is located just downstream of the National Forest boundary. 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).

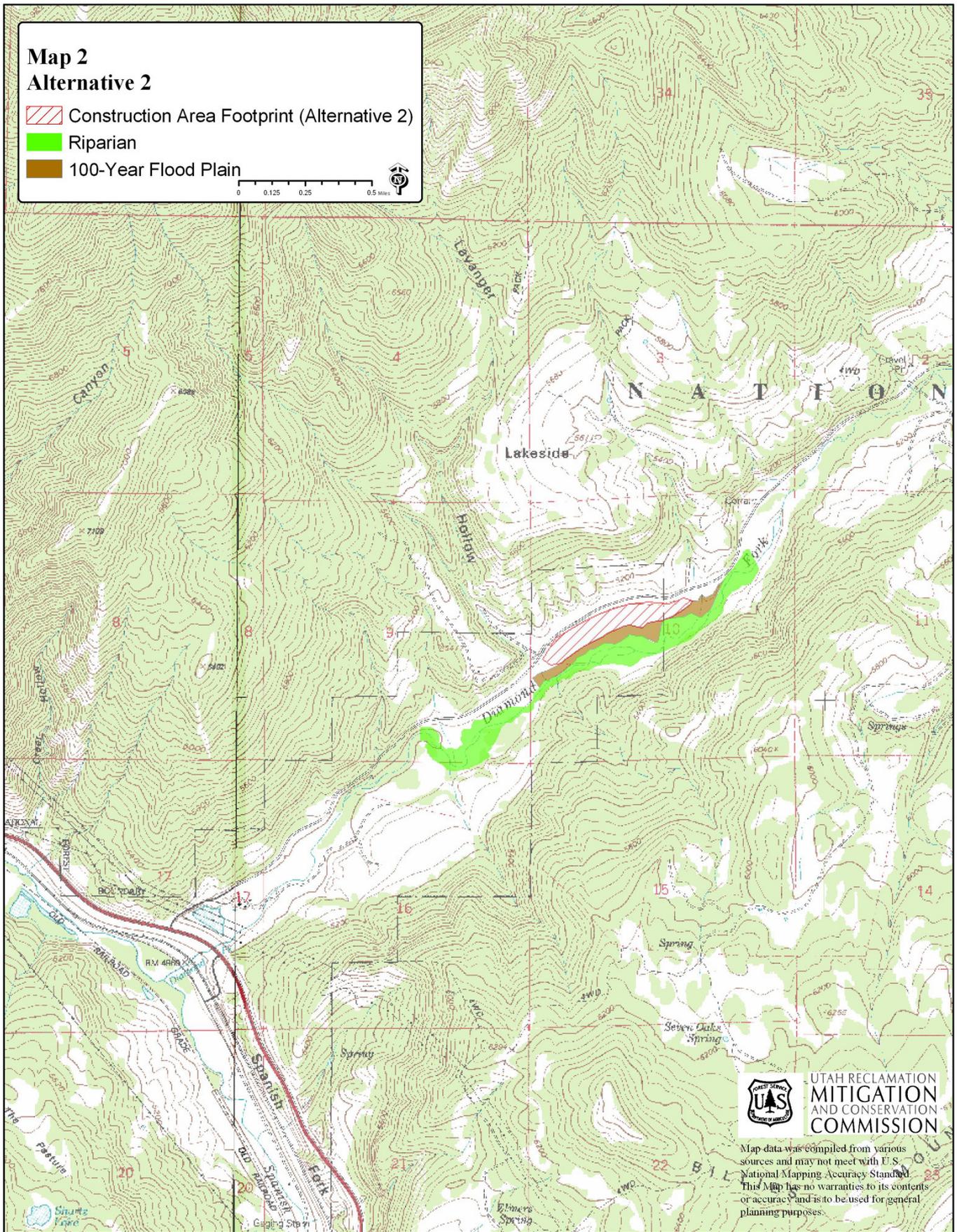
The group-site facility would encompass approximately 25 acres and would include three 50 PAOT sites, three 75 PAOT sites, and one 100 PAOT site. There would be approximately five, 2-unit vault toilets (or flush toilets if the water source allowed), paved access roads and spurs, shade shelters, a well 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. The site consists of former cultivated fields that were once part of the floodplain and riparian area bordering Diamond Fork Creek. This site is also adjacent to heavily populated Ute ladies' tresses habitats, an endangered 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 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

**Map 2  
Alternative 2**

-  Construction Area Footprint (Alternative 2)
-  Riparian
-  100-Year Flood Plain



Map data was compiled from various sources and may not meet with U.S. National Mapping Accuracy Standard. This Map has no warranties to its contents or accuracy and is to be used for general planning purposes.

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 possible, including supplemental watering until establishment.

### **Alternative 3**

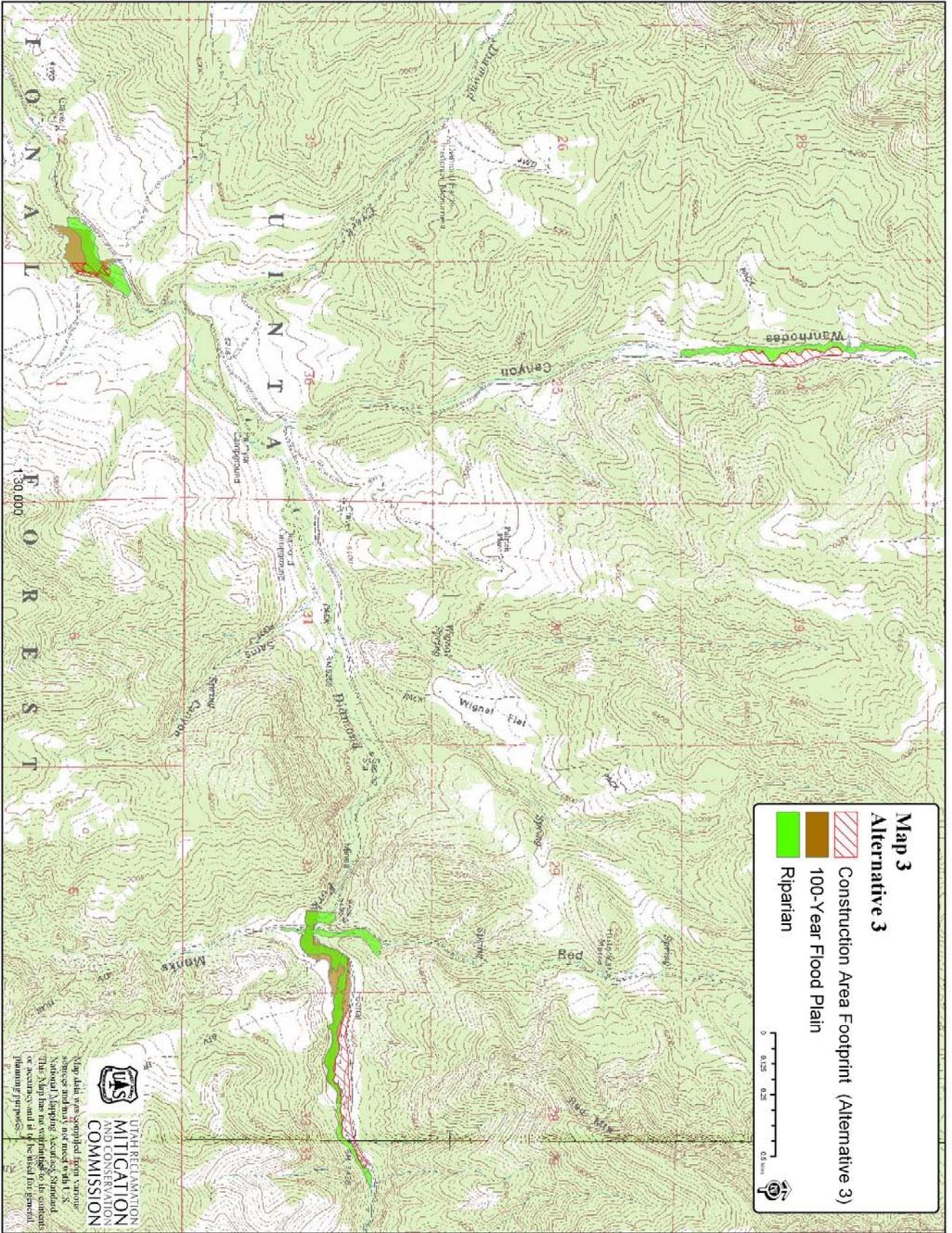
This alternative location is at three separate sites. The environmental affects of construction at all three sites will be analyzed. However, construction of the facility at two of the three of the sites would be considered as an option if the underlying need for the project would be met with fewer environmental 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 would be located at the confluence of Brimhall Canyon and Diamond Fork Creek. The areas 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 dissected 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 approximately one, 2-unit vault toilet, shade shelters, an information/fee station, and interpretive trail. A water 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 would accommodate 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 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 would be fenced and signed to restrict public access.

Much of the staging area is devoid of any vegetation, with some sagebrush, grasses, junipers and forbs. The upper end of the site has a large stockpile of materials removed during the drilling of the tunnel for the project. 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 adjacent to the proposed 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. The Uinta National Forest would conduct monthly bacteriological

sampling at the campground to verify water quality, and therefore, would not routinely chlorinate the water system.

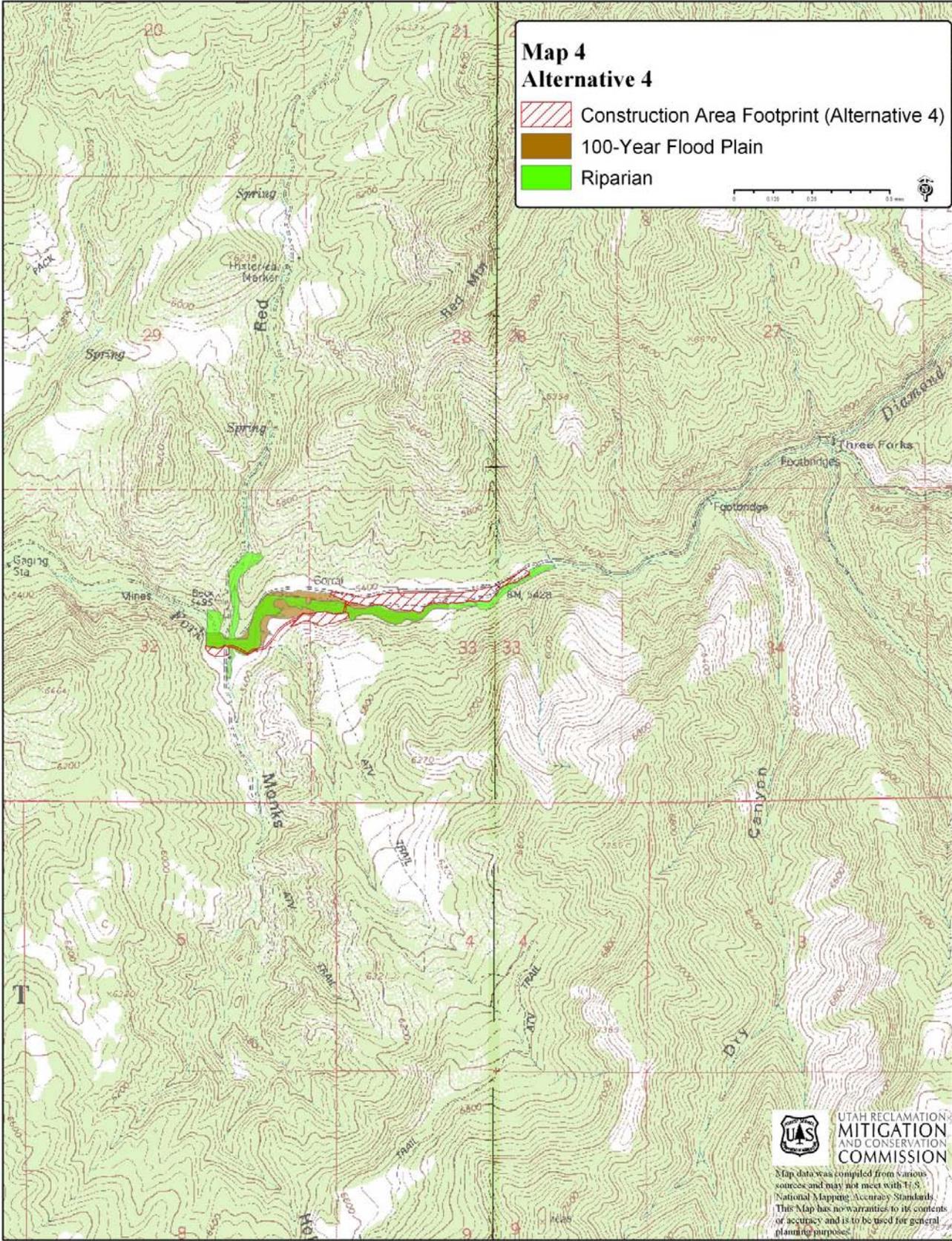
Mitigation measures unique to this site include interpretation, protection and monitoring of the cultural resources site, spring source and associated riparian area. Locating the campground host within visual site of the cultural resource site and/or establishing deterrent vegetation with appropriate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

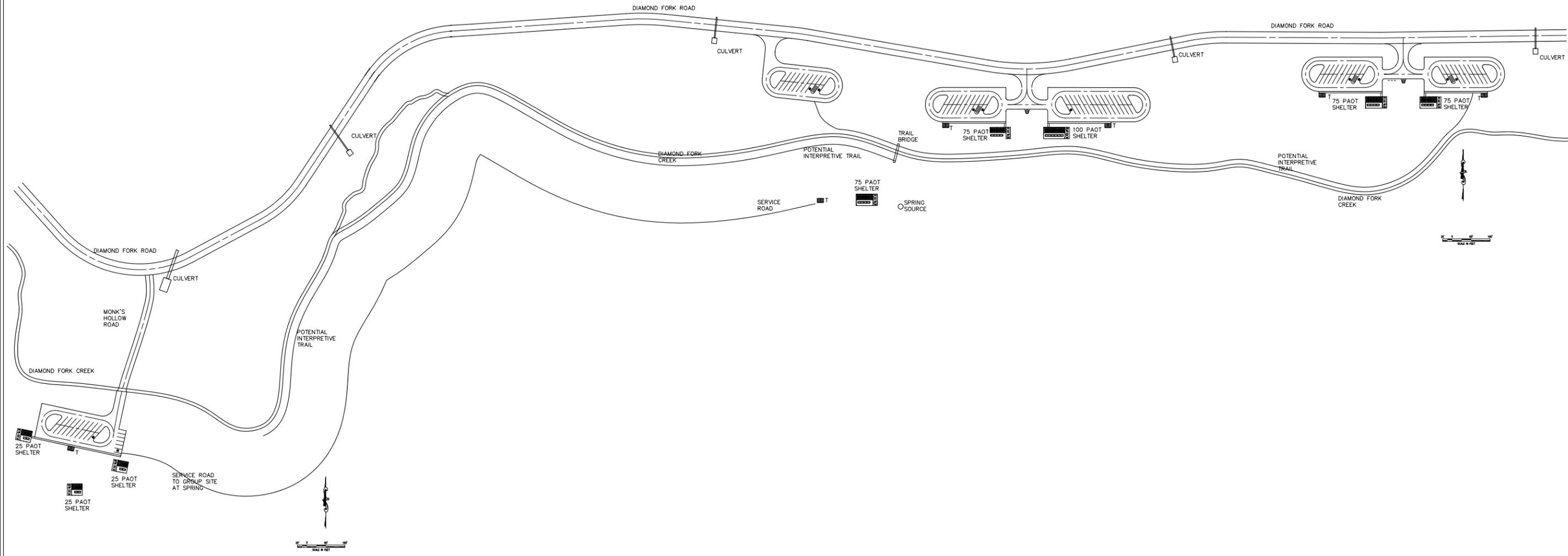
#### **Alternative 4**

Alternative 4 is the **Proposed Action**. Under this alternative all 475 PAOT would be constructed at the Monks Hollow site described under Alternative 3. 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. 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 or a combination of vault and flush toilets if the water supply was sufficient. See Alternative 4- Monks Hollow Map and Conceptual Plan for Alternative 4. The Conceptual Plan shows typical features and layout for this location. Features for other alternatives would be similar to those shown in the Conceptual Plan although they would be designed to fit into the construction area footprint identified for each respective location.

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 floodplain 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.





DESIGN	BY: B. LUDVIGSEN	DATE
DRAWING	CHECK: C. HARTMAN	
APPROVED:	BY: B. LUDVIGSEN	
	CHECK: C. HARTMAN	
	DIRECTOR, ENGINEERING	

**DIAMOND FORK GROUP AREA PROJECT**  
**GENERAL DEVELOPEMENT PLAN**



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 will limit sediment transport to Diamond Fork Creek and protect water quality. 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. Collection of firewood would be prohibited in the lower 7.5 miles of the Diamond Fork River Corridor. Firewood would be made available for sale from the campground concessionaire. Construction would not take place December through March to limit impacts on wintering bald eagles. 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.



# CHAPTER 3

## AFFECTED ENVIRONMENT 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 threatened, endangered and sensitive species**. 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, safety and fiscal.

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 high 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 riprapped 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 possible, 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. The portions of the administrative access road constructed in the 100-year floodplain and riparian area, amounting to approximately 0.34 acres, 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/ trampling) 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 occurred 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 necessarily 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. 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 users would be displaced to 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, 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, 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 a high 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. 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 no direct impacts 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 no direct impacts to riparian vegetation. Indirect impacts from campground users would be 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 1375 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 impact 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 15<sup>th</sup> through October 15<sup>th</sup>). 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). 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 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 and 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 2375 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. ENDANGERED, THREATENED AND SENSITIVE SPECIES**

There is a concern that construction of the group-site facility and associated visitor use could have detrimental effects on species designated as endangered, threatened or sensitive, in particular the Ute Ladies'-tresses orchid (*Spiranthes diluvialis*)

**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.

## **ENDANGERED, THREATENED AND SENSITIVE ANIMALS**

### **Affected Environment**

#### ***ENDANGERED AND THREATENED***

The United States Fish and Wildlife Service (USFWS) list the following federally protected animal species that could be affected by the proposed project. Federally Listed and Proposed (P) Endangered (E) and Threatened (T): 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). As described below, the Bald Eagle and Western Yellow-billed cuckoo are the only federally listed T&E species potentially directly, indirectly or cumulatively impacted by any of the alternatives.

***Bald Eagle*** Bald eagles require habitat that will provide them with open water for feeding and large, mature trees for nesting, roosting, and perching (DeGraaf et. Al. 1991). The winter habitat used by eagles includes lakes, streams or rivers for feeding (Saxton 1997). There are only four known breeding occurrences in Utah for bald eagles, none of which occur on the Uinta National Forest (UDNR 1998). Bald eagles use the Diamond Fork Creek riparian area for winter foraging and roosting habitat. There are no known nest sites within the area.

***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 2001 Natural Heritage database shows 18 known locations in Utah. All are at elevations below National Forest systems lands (Williams 2001). Even though potential habitat does exist within the Diamond Fork drainage, no western yellow-billed cuckoos have been found during breeding bird surveys conducted at Billies Mountain (1994, 2000), Two Tom Hill (1994, 2000) or along Diamond Fork Creek (1999-2002).

***Canada Lynx*** The Canada lynx requires boreal forest habitat of both typical old growth and an early successional structure, relying heavily on snowshoe hare as prey (USDA 1991). Presence of the Canada lynx has not been documented in Diamond Fork. The Diamond Fork drainage has been designated winter range based solely on habitat type. There is also a key linkage route along Strawberry Ridge bordering the east side of the drainage. There is no habitat in the project area for Canada lynx or snowshoe hares (dense coniferous stands over 7000 feet elevation), which is the primary food source for the lynx. There will be no effect on Canada lynx from any of the alternatives.

***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, 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 is currently known to exist for June sucker. Consumptive use of water for campground purposes in the Utah Lake system would be negligible and there would be no effect on 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). There would be no effect on Utah Valvata Snail from any of the alternatives.

#### ***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*), and Bonneville cutthroat trout (*Oncorhynchus clarki utah*), 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 (USDA 1991a). The species utilizes desert shrub, pinyon-juniper, pinyon-juniper-sagebrush, mountain brush, mixed forest, and ponderosa pine forest for foraging habitat (UDNR 2000a). 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) (UDNR 2000a). They use rock crevices high up on steep cliff faces. Cracks in limestone

and sandstone with 1-2 inches widths are important roosting sites (USDA 1991a). 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 analysis area that may provide potential habitat for this species, but will not be directly 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 (Zaveloff 1988). 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 (UDNR 1998b).

***Greater sage grouse*** Greater sage grouse inhabit sagebrush plains, foothills, and mountain valleys. Sagebrush is the predominant plant of quality habitat (UDWR 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 no greater sage grouse habitat, nor historic occurrence of greater sage grouse within the Diamond Fork area. Consequently, there will be no impacts to greater sage grouse under any of the alternatives.

***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 (Williams 1999; DeGraaf et al. 1991). They use previously excavated cavities in large diameter trees for nesting habitat (USDA 1991c). Limited habitat occurs for flammulated owls within the analysis area. . 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.

***Northern goshawk*** Northern goshawks are found on Timber Mountain approximately five miles northwest of the Monks Hollow site, but not in the proposed project areas for all the alternatives due to a lack of habitat. 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 1991a).

***Peregrine falcon*** Peregrines typically occupy open country habitats near water. Cliffs are preferred for nesting habitat and they typically prey on smaller birds (USDA 1991a). 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. There is potential habitat for peregrines in the Sixth Water Creek area, including the bridge area, but no potential habitat within the proposed project areas.

***Northern three-toed woodpecker*** The Northern three-toed woodpecker resides in mixed forest 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 1991c). No nesting habitat is within the proposed project areas, although limited, scattered habitat does occur in the Diamond Fork watershed.

***Bonneville cutthroat trout*** Currently most populations of Bonneville cutthroat trout are fragmented, occurring only in the headwaters of Diamond Fork Creek, where they have been less impacted by stocking of other fish species. As a result the connectivity between populations and the ability to repopulate an area after a local extinction has been lost. Bonneville cutthroat occur in the headwaters but are absent in the lower reaches due to stocking of rainbow trout, naturally reproducing brown trout, fishing pressure, and changes in habitat. The area of Halls Fork, Chase Creek, Yellow Jacket, and Shingle Mill provides the least fragmented area inhabited by cutthroat on the District. These drainages are above the proposed group sites, so there will be no effect on Bonneville cutthroat trout.

***Colorado River cutthroat trout*** Colorado River cutthroat trout are not endemic to this drainage and currently are not present within the Diamond Fork drainage.

***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 Wasatch Front spotted frog 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.

#### ***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).

***Neo-tropical Migratory Birds*** Riparian areas provide important nesting and foraging habitat for numerous bird species, including many species of neo-tropical migratory birds. Five neo-tropical migratory bird monitoring sites are located within the Diamond Fork watershed. Survey dates and number of species identified are shown in the following table.

ROUTE NAME	SURVEY DATE	NUMBER OF SPECIES
Billie's Mountain #1	05/24/1994	29
	06/01/2000	34
Billie's Mountain #2	06/01/1994	41
	06/02/2000	30
Ray's Valley #1	05/16/1994	23
	06/09/2000	31
Ray's Valley #2	07/18/1994	30
	06/30/1999	27
Two Tom Hill	06/29/1994	25
	06/30/2000	27
Diamond Fork Creek	06/16/1999	49
	07/16/2002	38

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. The broad-tailed hummingbird, a Utah Partners in Flight Avian Conservation

Strategy's Priority species associated with riparian areas (Parrish et al 1999) was found in all survey routes.

**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.

### **Environmental Affects**

#### ***Analysis Methods***

Data utilized for this analysis includes the *Diamond Fork Area Assessment* (USDA 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 and terrestrial wildlife and its habitat. The areas along Diamond Fork Creek and upper Sixth Water Creek were surveyed for wintering bald eagles by snowmobile during early winter of 2000. Neo-tropical migratory bird species monitoring surveys were conducted during 1994, 1999, 2000, and 2002. Beaver surveys in the Diamond Fork drainage were conducted in the spring of 2002. Assumptions are made from observation, literature review and experience.

#### ***Alternative 1***

##### ***T&E SPECIES, SENSITIVE SPECIES AND SPECIES OF CONCERN***

Under the No Action Alternative the group-site campground would not be constructed and there would be no direct or indirect impacts. All 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***

##### ***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 habitat for the Western yellow-billed cuckoo at this site.

No habitat or use of the Diamond Fork drainage is currently known to exist for June sucker consequently there will be no direct or indirect effects to this species under this Alternative.

The Utah Valvata Snail is considered to be extirpated within the State of Utah consequently there will be no direct or indirect effects to this species under this Alternative.

#### *SENSITIVE SPECIES*

The Monks Hollow adit which provides habitat to the Townsend's big-eared bat is approximately six (6) miles from the proposed group sites. There would be no direct or indirect effects to the bats from this alternative.

Bonneville cutthroat occur in the headwaters of the Diamond Fork drainage but are absent in the lower reaches of the watershed. These headwater habitat areas are above the proposed group sites consequently there will be no direct or indirect effects to this species under this Alternative.

Colorado River cutthroat trout are not endemic to the Diamond Fork drainage and currently are not present within the watershed consequently there will be no direct or indirect effects to this species under this Alternative.

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. Although indirect effects, resulting from disturbance caused by increased human activity within adjacent habitat areas, are anticipated it is believed that any indirect effects will be minimal under this Alternative.

There would be no direct impact on Columbia spotted frogs or their habitat. Spotted frogs occupy springs or riparian wetlands neither of which would be directly impacted by construction. However, the proposed site is in close proximity to wetlands occupied by spotted frogs. Indirect impacts from human disturbance on spotted frog would be greater at this site than any other alternative.

#### *SPECIES OF CONCERN*

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.

#### *Neo-tropical Migratory Birds*

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. The total construction area footprint would be approximately 25 acres. The area actually occupied by facilities would be approximately 6 acres. 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 late July.

There will be no direct loss of nesting/foraging habitat to birds that rely on the riparian habitat, such as the warbling vireo, as construction activities will not occur there. Disturbance from construction activities during the nesting season could have indirect effects on the nesting birds leading to nest abandonment.

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

#### *Golden Eagles*

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***

##### *T&E SPECIES*

The Brimhall area is used by wintering bald eagles. Eagle surveys were conducted in the winter of 1999. The Brimhall site had the highest concentration of all the survey sites. Construction of a campground within this site will result in a direct impacts on winter roosting habitat. Indirect impacts from human disturbance 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 no direct effects to populations of this species as the area is currently not occupied by the cuckoo. Construction of a group campsite at this location would require clearing of 1.5 acres of riparian vegetation, indirectly affecting the quality of 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.

No habitat or use of the Diamond Fork drainage is currently known to exist for June sucker consequently there will be no direct or indirect effects to this species under this Alternative.

The Utah Valvata Snail is considered to be extirpated within the State of Utah consequently there will be no direct or indirect effects to this species under this Alternative.

#### *SENSITIVE SPECIES*

This site is approximately four (4) miles from the Monks Hollow adit and the Townsend's big-eared bats. There will be no direct or indirect effects to the bats from this alternative.

Bonneville cutthroat occur in the headwaters of the Diamond Fork drainage but are absent in the lower reaches of the watershed. These headwater habitat areas are above the proposed group sites consequently there will be no direct or indirect effects to this species under this Alternative.

Colorado River cutthroat trout are not endemic to the Diamond Fork drainage and currently are not present within the watershed consequently there will be no direct or indirect effects to this species under this Alternative.

Columbia spotted frog and/or their habitat are not present within or adjacent to the proposed project area consequently there will be no direct or indirect effects to this species under this Alternative.

#### *SPECIES OF CONCERN*

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.

#### *Neo-tropical Migratory Birds*

There would be direct impacts to neo-tropical migratory birds at this location through the loss of nesting and foraging habitat in the floodplain and surrounding area. Indirect effects from increase human presence would be similar to those described for Alternative 2.

#### *Golden Eagles*

The West of Brimhall Canyon territory has been observed from 1996 through 2002 (Keller, 2002). 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***

#### *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 eagles, but they have not been observed here. There will be no direct or indirect effects on wintering bald eagles.

Potential habitat for the Western yellow-billed cuckoo exists at the mouth of Wanrhodes Creek at its confluence with Diamond Fork Creek. There is no potential habitat 3 miles upstream in the proposed site. Construction of a group site at this location will have no direct or indirect effects to the cuckoos.

No habitat or use of the Diamond Fork drainage is currently known to exist for June sucker consequently there will be no direct or indirect effects to this species under this Alternative.

The Utah Valvata Snail is considered to be extirpated within the State of Utah consequently there will be no direct or indirect effects to this species under this Alternative.

#### *SENSITIVE SPECIES*

This site is approximately three (3) miles northwest of the Monks Hollow adit. There will be no direct or indirect effects to the Townsend's big-eared bat.

Bonneville cutthroat occur in the headwaters of the Diamond Fork drainage but are absent in the lower reaches of the watershed. These headwater habitat areas are above the proposed group sites consequently there will be no direct or indirect effects to this species under this Alternative.

Colorado River cutthroat trout are not endemic to the Diamond Fork drainage and currently are not present within the watershed consequently there will be no direct or indirect effects to this species under this Alternative.

Columbia spotted frog and/or their habitat are not present within or adjacent to the proposed project area consequently there will be no direct or indirect effects to this species under this Alternative.

#### *SPECIES OF CONCERN*

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.

#### *Neo-tropical Migratory Birds*

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.

#### *Golden Eagles*

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

#### *Monks Hollow*

##### *T&E SPECIES*

Surveys in 2000 showed no use of this area by wintering bald eagles. There is potential for the eagles to use this area once construction activities cease since the riparian vegetation has been protected. Placement of a campground here should have no long-term direct or indirect detrimental effects to wintering bald eagles as the primary use of the facility will not occur during winter.

There is potential 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 disturb less than 0.1 acre of riparian habitat. Human disturbance associated with the group campsites could preclude this area from ever being used by cuckoos.

No habitat or use of the Diamond Fork drainage is currently known to exist for June sucker consequently there will be no direct or indirect effects to this species under this Alternative.

The Utah Valvata Snail is considered to be extirpated within the State of Utah consequently there will be no direct or indirect effects to this species under this Alternative.

### *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. Townsend's big-eared bats are very sensitive to human disturbance.

Bonneville cutthroat occur in the headwaters of the Diamond Fork drainage but are absent in the lower reaches of the watershed. These headwater habitat areas are above the proposed group sites consequently there will be no direct or indirect effects to this species under this Alternative.

Colorado River cutthroat trout are not endemic to the Diamond Fork drainage and currently are not present within the watershed consequently there will be no direct or indirect effects to this species under this Alternative.

Columbia spotted frog and/or their habitat are not present within or adjacent to the proposed project area consequently there will be no direct or indirect effects to this species under this Alternative.

### *Species of Concern*

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 not direct impacts on leatherside chub habitat and minimal indirect impacts from campground users.

### *Neo-tropical Migratory Birds*

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. The area has since been cleared of these things. 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 have the least effect on neo-tropical migratory birds of any of the action alternatives.

Indirect effects to the birds would be of similar in type as described for Alternative 2.

### *Golden Eagles*

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 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***

Effects would be similar to those described for the Monks Hollow site under Alternative 3. Indirect impacts would be proportionally higher with all 475 PAOT located at this site.

## **ENDANGERED, THREATENED AND SENSITIVE PLANTS**

### **Affected Environment**

#### **Endangered and Threatened Plant Species**

Three federally listed endangered plants occur within the Spanish Fork River drainage: clay phacelia (*Phacelia argillacea*), Deseret milkvetch (*Astragalus desereticus*) and Ute ladies'-tresses orchid (*Spiranthes diluvialis*) (ULT). 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 this project's areas (Campellone, 2001, Campellone 2002, Heaton 2001).

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 more than 77 acres with populations. The total number of flowering plants fluctuates greatly from year to year. In 1998, a record number of plants were noted: counts estimated over 16,000 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 latifolium*), 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.

### **Sensitive Species**

Of the six sensitive plant species known to occur on the Forest, or to have potential habitat within the Forest, none is 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 9000 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**

#### ***Alternative 1***

There would be no direct or indirect impacts to Endangered, Threatened, or Sensitive plant species under the No Action Alternative.

### ***Alternative 2***

In 1998, the largest flowering year on record for ULT in Diamond Fork, the colonies in the 5 acres closest to the proposed campground included 2,589 flowering individuals. This accounted for approximately 15% of the total number of flowering plants counted in Diamond Fork that year. In 1999, these colonies included 2,019 flowering individuals - more than one-third of the canyon-wide count. In 2000 and 2001 the counts were 2,462 and 1,524 respectively. 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.

Indirect impacts on ULT and its habitats would be greater under this alternative than any other. Approximately 5 acres of ULT habitat lie in riparian areas immediately adjacent to the site under this alternative. The impacts would be from increased human trailing through the populations, and 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 threatened, endangered or sensitive plant species from construction. 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.

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 threatened, endangered or sensitive species from construction. 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 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 very attractive to playing children. 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 including 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, one or more additional protection measures would be implemented.

## OTHER ISSUES

### NON-THREATENED AND ENDANGERED WILDLIFE AND FISH

#### Affected Environment

Management Indicator Species (MIS) are listed in Appendix B of the Forest 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. MIS species include beaver, Northern goshawk, three-toed woodpecker, and Bonneville cutthroat and Colorado River cutthroat trout.

#### **Existing Condition**

**Beaver** The Diamond Fork Area Assessment (2000) describes the area as having a large beaver population in many areas of wide willow complexes during pre-settlement conditions. Over time, the beaver populations declined due to overgrazing of willows, road building in the bottoms of drainages, and trapping. They reached a low point in the 1940's, and were only found in the headwaters of Diamond Fork and Fifth Water. Today beaver are found in a majority of creeks within the Diamond Fork Watershed.

Riparian habitats are found within the proposed project areas and throughout the Diamond Fork drainage. 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. Diamond Fork Creek had seventeen 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. No potentially active or abandoned beaver dams were found in the unnamed tributary. One potentially active beaver dam was found on Sixth Water Creek three-quarters to a mile upstream of the Rays Valley Road Bridge and Sixth Water Creek crossing. Over fifty (50) dams were counted on Wanrhodes Creek in the two and a half (2 ½) miles from where the road meets with Diamond Fork Road.

No beaver dams were found in the Diamond Fork Creek between Three Forks and Highway 6. This is probably a result of the high flows or irrigation water that is 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, it is probable that the beaver will expand their territories to the rest of Diamond Fork Creek.

Based on the professional judgment and field observations by Forest Service wildlife biologists, the data described above is indicative of beaver populations and trends throughout the rest of the Diamond Fork drainage.

***Northern goshawk*** Northern goshawks are found on Timber Mountain approximately five miles northwest of the Monks Hollow site, but not in the proposed project areas for any of the alternatives due to a lack of habitat.

The Forest has been monitoring goshawk population trend since 1996 by monitoring territory occupancy (USDA 1996-2003). Between 13 and 19 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.

***Northern three-toed woodpecker*** The Northern three-toed woodpecker resides in mixed forest and requires dead trees for cavity nests. No nesting habitat is within the proposed project areas for all of the alternatives, although limited, scattered habitat does occur in the Diamond Fork watershed.

Eleven surveys specific for three-toed woodpeckers were conducted Forest wide in 2003. Only one of the areas surveys (on the Heber Ranger District) located three-toed woodpeckers. Forest surveys prior to the 2003 surveys are discussed in the Biological Evaluation.

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), but 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 populations of Bonneville cutthroat trout within the Diamond Fork watershed are fragmented, occurring only in the headwaters of Diamond Fork Creek, where they have been less impacted by the introduction of non-native fish species. Because of this fragmentation and the loss of connectivity between these populations, the ability of Bonneville cutthroat trout within the Diamond Fork watershed to repopulate an area after local extirpation has been lost.

Although Bonneville cutthroat occur in the headwaters of the Diamond Fork drainage they are largely absent from the lower reaches of the watershed due to stocking of rainbow trout, competition from naturally reproducing brown trout, fishing pressure, and changes in habitat conditions. The area of Halls Fork, Chase Creek, Yellow Jacket, and Shingle Mill provides the least fragmented area inhabited by cutthroat trout within the Diamond Fork drainage. These sub-watersheds and their associated populations are above the proposed group sites, consequently this project will have no effect on existing Bonneville cutthroat populations within the watershed.

Population trend data for Bonneville cutthroat trout and Colorado River cutthroat trout has been assessed at both the Forest wide and watershed or population level. These data have been compiled from fish population monitoring data collected by biologists from both the United States Forest Service (USFS) and Utah Department of Wildlife Resources (UDWR) during the period between 1975 and 2002.

Because this data has been collected by a number of individuals and agencies using differing protocols in different locations, the use of this data in the development of population trends needs to be approached with caution. The results presented here are only intended to describe general trends in a very broad sense. Under the MIS monitoring plan developed for the Unita National Forest, it is anticipated that the addition of data collected specifically for the development of population trends for cutthroat trout on the Forest will enhance this data set and ultimately transform it into a viable and robust monitoring tool.

*Forest Wide* – Population trend data using indices of overall condition (K Factor) for cutthroat trout in representative monitoring sites across the Forest indicate a slight increase ( $P < 0.025$ ;  $r^2 = 0.47$ ) in the overall condition of cutthroat trout at these sites during the period between 1975 and 2002. However, these same data indicate that during the time period between 1991 and 2002 the overall condition of cutthroat trout within these sites show no observable change.

Population trend data using the abundance of cutthroat trout in representative monitoring sites across the Forest are not sufficient to show an observable change in the overall abundance of cutthroat trout at these sites during the period between 1979 and 2002.

*Diamond Fork* – Population trend data using indices of overall condition (K Factor) for cutthroat trout at representative monitoring sites within the watershed indicate an increase ( $P < 0.10$ ;  $r^2 = 0.98$ ) in the overall condition of cutthroat trout within these sites during the period between 1976 and 1991. Population trend data using the abundance of cutthroat trout at representative monitoring sites within the watershed only contains baseline data (average 0.48 fish/m) collected in 1979.

***Colorado River Cutthroat Trout*** Colorado River cutthroat trout are not endemic to or present within the Diamond Fork watershed and are not further addressed in this document.

### ***Analysis Methods***

Data utilized for this analysis includes the *Diamond Fork Area Assessment* (USDA 2000). The Diamond Fork watershed has been surveyed for MIS and their habitat. Neotropical migratory bird species monitoring surveys were conducted during 1995 and

1999. Beaver surveys were conducted in the spring of 2002. Assumptions are made from observation, literature review and experience.

### **Environmental Affects**

#### ***Alternative 1***

MIS species will continue to use the area as described in the existing condition. There will be no permanent habitat loss. There will be potential for increased loss of riparian habitat from existing 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.

#### ***Alternative 2***

There will be no impact 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 the stream. Without the high annual flows, beaver will be able to colonize areas and build dams in areas that are currently washed out in the high flows.

There will be no direct or indirect effects to the Northern goshawk, Northern 3-toed woodpecker, Bonneville cutthroat trout or Colorado River cutthroat trout, as there is no habitat for these species at 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. It is unlikely that beaver will expand their range into this area until natural flows return to Diamond Fork Creek.

There will be no direct or indirect effects to the Northern goshawk, Northern 3-toed woodpecker, Bonneville cutthroat trout or Colorado River cutthroat trout, because the species are not present or typically found within the project area.

##### ***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 campsite.

There will be no direct or indirect effects to the Northern goshawk, Northern 3-toed woodpecker, Bonneville cutthroat trout, Colorado River cutthroat trout, because the species are not present or typically found within the project area.

#### *Monks Hollow*

No beaver dams found within this area during the 2002 surveys. The closest beaver activity occurs approximately 5 miles upstream of this site. Beavers may return to the area once the creek returns to natural flows.

There will be no direct or indirect effects to the Northern goshawk, Northern 3-toed woodpecker, Bonneville cutthroat trout or Colorado River cutthroat trout because the species are not present or typically found within the project area.

#### *Alternative 4*

Same as described for Monks Hollow alternative 3.

## **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 a plan to be prepared by the Forest Service. 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.

*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 for wildlife purposes in accordance with the *Red Hollow 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 would be indirect impacts to wildlife on these parcels with increased human presence in the area.

#### ***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.

## **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 larger 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**

Adverse effects to the homestead near the Monks Hollow proposed group-site would be mitigated through a Memorandum of Agreement (MOA) with the Utah State Historical Preservation Office. Specific mitigation measures include interpretation of Diamond Fork's homesteading history at the group-site, and site protection (fencing). Any indirect impacts to the homesteads near any of the proposed group-sites would be mitigated through interpretation and/or site monitoring, also documented through the MOA.

### ***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**

Direct impacts to the homestead cabin would be mitigated through fencing, signing and interpretation through an MOA with the Utah State Historical Preservation Office as described for the Monks Hollow site under Alternative 3.

## VEGETATION AND NOXIOUS WEEDS

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

### Affected Environment

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 Gambel 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 (*Convolvulus 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. Bulb 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 sites range from 5 to 10 feet above the water table and only support 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 wildrye (*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 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 is about 10 acres and 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 bisected 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 10 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, 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 support 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 wildrye. Much of the 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 recontoured, 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. 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***

This alternative has construction of all group-site features in the Monks Hollow area, on both the north and south sides of Diamond Fork Creek. This proposed site involves about 40 acres, of which perhaps 6 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 east to west than in Alternative 3, with somewhat less construction on the existing fill area and more in relatively natural

vegetation. 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. A small amount of 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.

## **CATTLE GRAZING**

### **Affected Environment**

Alternative 3 and Alternative 4 are located within the Diamond Fork Grazing Allotment. The allotment is permitted for 2141 cow/calf pairs from 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 south west 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. Without an increase in disturbance from people, traffic, and noise, proper cattle distribution could be achieved.

Attainment of grazing standards could be met with cattle staying on the allotment the current amount of time. It would be easier to corral and/or trail cattle under this alternative compared to Alternatives 3 or 4.

### ***Alternative 2***

This alternative is the least disruptive to grazing management. Since this alternative is outside the Diamond Fork Allotment it has little effect on the grazing program. Cattle trail down the Diamond Fork Road in the fall. There is an existing fence on the south side of the road to keep cattle from the proposed site. Attainment of grazing standards could be met with cattle staying on the allotment the current amount of time. 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 compared to 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 500 head of cattle. Numerous trips could also be made with smaller groups of cattle. It would be more difficult to move cattle through the area with people 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 public. 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 is part of 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 13.65 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 19.34 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 Cumulative Effects Analysis Area Map). Impacts from any of the action alternatives are not anticipated outside this analysis area. Related projects are described below.

### ***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 instream 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 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 1999. 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*

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.

### ***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 tentatively identified 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 is the need to protect riparian resources and wet meadows.

#### *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 better protection against erosion.

#### *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 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.

### ***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 2002 identifying a conceptual list of recreation features that would complete the recreation commitments of the Diamond Fork System. The plan tiered of 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*

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 allotments.

### *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 trailbikes), as well as foot, horse, and mountain bike travel. The proposed trail would connect the Teat Mountain and Monks Hollow trail systems. The proposal responds to a need to provide additional designated ATV trails, where ATV can be controlled and managed.

### **Cumulative Affects**

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, more than 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 Fencing and Range Improvement* projects all have elements for the purpose of improving riparian habitats.

### ***Cumulative Affects***

#### ***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 impacts on riparian habitats under this alternative and therefore no cumulative affects. However, the potential for riparian restoration is the highest 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.

#### ***Alternative 3***

If the Brimhall site were selected as part of this alternative, approximately 2.2 acres of riparian habitat would be directly affected by construction at that site. 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 and Historic Land Use Practices*.

#### ***Alternative 4***

Approximately 0.44 acres of riparian habitat would be affected by construction under this alternative. 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 and Historic Land Use Practices*.

### **Issue 3 Endangered, Threatened and Sensitive Species**

Past projects in Diamond Fork have likely impacted Endangered, Threatened and Sensitive Species. *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/fruitletting 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.

Winter roosting habitat for bald eagles has been lost in proportion to losses in riparian habitats as described in the previous section.

### ***Cumulative Affects***

#### ***Alternative 1***

There would be no cumulative affects on Threatened, Endangered or Sensitive plant species.

#### ***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***

If the Brimhall site were selected as part of this alternative, there would be a loss of approximately 2.2 acres of riparian habitat. This would impact winter roosting habitat for Bald Eagles. This impact would add cumulatively to past, present and reasonably foreseeable interrelated projects.

#### ***Alternative 4***

There would be no cumulative affects on Threatened, Endangered or Sensitive plant species.

### **Other Issues**

#### **Non-Threatened and Endangered Wildlife and Fish**

*Dispersed Camping Management* and the *Monks Hollow Motorized Trail* are projects currently undergoing analysis 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 minimizing unregulated ATV use in non-designated areas.

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 this area to a large degree. The increased flows wash out the beaver dams. The new flow regime will allow for improved habitat for beavers.

*Historic Land Use Practices* including grazing and clearing for agricultural production have resulted in a reduction of wildlife habitats for many species. Other past, present or reasonably foreseeable future projects including the construction of the *Diamond Fork Pipeline, Angler-Access and Wildlife Mitigation Land Acquisitions, Diamond Fork System Completion, Redford Fencing, Sixth Water and Diamond Fork Creek Restoration and Monitoring and range improvements* will improve wildlife habitat.

### ***Cumulative Affects***

#### ***Alternative 1***

There would be no permanent habitat loss under this alternative and therefore no cumulative impacts. There will be the potential for increased loss of riparian habitat from existing uncontrolled dispersed recreation use.

#### ***Alternative 2***

There are no cumulative affects associated with past, present or reasonably foreseeable future interrelated projects that would lead to significant adverse effects on wildlife.

#### ***Alternative 3***

There are no cumulative affects associated with past, present or reasonably foreseeable future interrelated projects that would lead to significant adverse effects on wildlife.

#### ***Alternative 4***

There are no cumulative affects associated with past, present or reasonably foreseeable future interrelated projects that would lead to significant adverse effects on wildlife.

### **Heritage Resources**

#### **Cumulative Impacts**

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.

### **Cumulative Affects**

#### ***Alternative 1***

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

#### ***Alternative 2***

Same as Alternative 1.

#### ***Alternative 3***

There is a single archaeological site located along the margins 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.

#### ***Alternative 4***

The walk-in campsite under this alternative would be within ¼ mile of the archaeological site. The probability of indirect impacts from increased human presence is 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 preparation and implementation of monitoring and protection measures.

### ***Vegetation and Noxious Weeds***

#### ***Alternative 1***

Popular dispersed campsites would continue to be used by large groups, such as those in upper Wanrhodes, and the impacts associated with such activity would continue, such as trampling and resultant death of vegetation, active 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.

Lightening 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, currently a bare soil pad, is to be rehabilitated and revegetated.

#### ***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 0.01 percent of the total land area within the watershed. 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***

No more than 4.5 acres of upland habitat would be impacted under this alternative, less than 0.01 percent of the total land area within the watershed. 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 0.01 percent of the total land area within the watershed. 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 tend to 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 manage 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 where impacts can be managed, but will tend to decrease in other non-designated areas where impacts from illegal ATV use are of greater concern.



**Table 2**

**Summary of Environmental Effects and Significant Issues**

	<b>Alternative 1 (No Action)</b>	<b>Alternative 2</b>	<b>Alternative 3 (two or more sites)</b>	<b>Alternative 4 (Preferred Alternative)</b>
<b>Issue 1. Stream Restoration</b>	No direct or indirect impacts on opportunities for future stream restoration efforts.	Same as Alternative 1.	<i>Brimhall</i> Would be constructed partially in the active floodplain (approx. 0.82 acres). Stream restoration would be hampered by restricting lateral migration of the river channel and periodic overbank flooding on the active floodplain. <i>Wanrhodes</i> No direct or indirect affects. <i>Monks Hollow</i> 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 (approx. 0.44 acres), campground features would be constructed out of the 100-year floodplain and riparian area. The administrative access road and footbridge constructed in the 100-year floodplain and riparian area would not need to be protected from overbank flows and the river would not need to be hardened.
<b>Issue 2. Riparian Habitats</b>	There would no direct impacts on riparian habitats. Indirect impacts would continue from dispersed use.	No direct impacts on riparian habitat from construction. Potential for riparian restoration highest at this site than any alternative. Indirect impacts on existing habitats would occur from visitor use.	<i>Brimhall</i> Approximately 2.2 acres of riparian habitat affected from construction. Indirect impacts from visitor use would be proportionally similar to alternative 2. <i>Wanrhodes</i> Less than 0.1 acres of riparian habitat affected from construction. Indirect impacts from visitor use would be	Approximately 0.44 acres would be constructed in the riparian area, primarily the administrative access road and footbridge (although an existing dirt road void of existing vegetation is included in a portion of that amount). Indirect impacts on riparian habitats from visitor use would be proportionally similar to Alternatives 2 and 3.

**Table 2**

**Summary of Environmental Effects and Significant Issues**

	Alternative 1 (No Action)	Alternative 2	Alternative 3 (two or more sites)	Alternative 4 (Preferred Alternative)
<b>Construction Area Footprint (acres)</b>				
			proportionally similar to alternative 2.  <i>Monks Hollow</i> Less than 0.1 acres of riparian habitat affected from construction.  Indirect impacts from visitor use would be proportionally similar to alternative 2.	
			<i>Brimhall</i> Construction Area Footprint .....3.07 acres Area occupied by facilities.....1.5 Upland Area.....0.72 Riparian .....0.44 100-year floodplain.....0.82 Riparian and 100-year floodplain .....1.09	Construction Area Footprint .....19.34 acres Area occupied by facilities.....6.5 Upland Area.....18.17 Riparian.....0 100-year floodplain.....0.73 Riparian and 100-year floodplain.....0.44
			<i>Wanrhodes</i> Construction Area Footprint .....9.6 acres Area occupied by facilities.....1.7 Upland Area.....9.5 Riparian .....<0.1 100-year floodplain.....0 Riparian and 100-year floodplain .....0	
			<i>Monks Hollow</i> Construction Area Footprint .....13.65 acres Area occupied by facilities.....2.8 Upland Area.....13.55 Riparian .....<0.1 100-year floodplain.....0	
	NA	Construction Area Footprint .25 acres Area occupied by facilities.....6 Upland Area .....24.9 Riparian .....<0.1 100-year floodplain .....0 Riparian and 100-year floodplain.....0		

**Table 2**

**Summary of Environmental Effects and Significant Issues**

	<b>Alternative 1 (No Action)</b>	<b>Alternative 2</b>	<b>Alternative 3 (two or more sites)</b>	<b>Alternative 4 (Preferred Alternative)</b>
<b>Issue 3. Threatened, Endangered and Sensitive Animal Species</b>	No direct or indirect impacts.	<p><i>T&amp;E Species</i> No direct or indirect impacts.</p> <p><i>Sensitive Species</i> Negligible indirect impacts on Bonneville Cutthroat Trout.</p> <p>There would be no direct impact on Columbia spotted frogs or their habitat. Proposed site is in close proximity to wetlands occupied by spotted frogs. Indirect impacts on spotted frog would be greater at this site than any other alternative.</p> <p><i>Species of Concern</i> There would be no direct impact on Leatherside chubs or their habitat. Indirect impacts on Leatherside chub would be greater at this site than other alternatives.</p> <p>Loss of nesting and foraging habitat utilized by neo-tropical migratory birds in the form of brush habitats. No direct impacts</p>	<p>Riparian and 100-year floodplain .....0</p> <p><b><i>Brimhall</i></b> <i>T&amp;E Species</i> Construction would cause riparian damage that would directly affect winter roosting habitat. Indirect impacts would also occur if the campground is open for use during the winter months.</p> <p><i>Sensitive Species</i> No direct or indirect effects on Townsend's big-eared bat.</p> <p>No affect on Columbia spotted frog.</p> <p><i>Species of Concern</i> No direct impacts on Leatherside chub habitat and minimal indirect impacts from campground users.</p> <p>Direct impact on riparian dependent neo-tropical bird species with loss of riparian habitat. Also loss of nesting and foraging habitat utilized by neo-tropical in the form of brush habitats.</p> <p><b><i>Wanrhodes</i></b> <i>T&amp;E Species</i> No direct or indirect effects on bald eagle.</p>	<p>Impacts would be similar to those described for Monks Hollow under Alternative 3 but proportionally higher with all 475 PAOT located at a single site.</p>

**Table 2**

**Summary of Environmental Effects and Significant Issues**

	Alternative 1 (No Action)	Alternative 2	Alternative 3 (two or more sites)	Alternative 4 (Preferred Alternative)
		<p>on riparian dependent species. Less than 1 mile from active Golden Eagle nesting site.</p>	<p><i>Sensitive species</i> No direct or indirect effects on Townsend's big-eared bat.  No affect on Columbia spotted frog.  <i>Species of Concern</i> No direct impacts on Leatherside chub habitat and minimal indirect impacts from campground users.  Similar impacts on neo-tropical birds as alternative 2.  <b>Monks Hollow T&amp;E Species</b> No direct or indirect effects to wintering bald eagles.  <i>Sensitive species</i> There would be no direct impacts Townsend's big-eared bats from construction. However, indirect impacts greatest under this alternative.  No affect on Columbia spotted frog.  <i>Species of Concern</i></p>	

**Table 2**

**Summary of Environmental Effects and Significant Issues**

	<b>Alternative 1 (No Action)</b>	<b>Alternative 2</b>	<b>Alternative 3 (two or more sites)</b>	<b>Alternative 4 (Preferred Alternative)</b>
<b>Threatened, Endangered and Sensitive Plant Species</b>	New flow regime may result in reduction of suitable habitat for ULT and some shifting of colony locations.	No direct impacts from construction on ULT and their habitats.  Indirect impacts on ULT and their habitats would be greater under this alternative than any other. Approximately 5 acres of ULT habitat lie in riparian areas immediately adjacent to the site under this alternative.	There would not be direct impacts on Leatherside chub habitat and minimal indirect impacts from campground users.  Similar impacts on neo-tropical birds as alternative 2.  <b>Brimhall</b> No direct impacts from construction on ULT and their habitats.  Potential indirect impacts on colony located approximately 1/3 mile from the lower end of this site.  <b>Wanrhodes</b> No direct impacts from construction on ULT and their habitats.  Little potential habitat for the species and therefore no effect.  <b>Monks Hollow</b> No direct impacts from construction on ULT and their habitats.  Potential indirect impacts on colonies located approximately 1.5 miles away.	Impacts would be proportionally similar as described for the <i>Monks Hollow</i> site under Alternative 3.

**Table 2**

**Summary of Environmental Effects and Significant Issues**

	<b>Alternative 1 (No Action)</b>	<b>Alternative 2</b>	<b>Alternative 3 (two or more sites)</b>	<b>Alternative 4 (Preferred Alternative)</b>
<b>CUP Wildlife Mitigation</b>	No impacts	There would be indirect impacts to wildlife on the adjacent 617 acre Redford Mitigation parcel. However, public use during the critical winter months would not be as frequent as other times of the year.	<i>Monks Hollow</i> Indirect impacts from increased foot-traffic on the 640 acre Red Hollow Mitigation lands could result although public use limited to foot traffic and during the critical winter months would not be as frequent as other times of the year.	Same as described for Monks Hollow under Alternative 3 except proportionally higher with increased campground capacity.

## 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.

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.”
<b>Response:</b> Alternative 4 is most responsive to the purpose and need of the project (pages 1-4 and 1-5) and best addresses the driving 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.”
<b>Response:</b> 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.”

LETTER NUMBERS	ISSUE # / SUMMARY	EXCERPTS FROM LETTERS
<b>Response:</b> 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.”
<b>Response:</b> 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.	<p>“There are areas close to the campgrounds that would be vulnerable to foot traffic and need to be protected from trampling”,</p> <p>“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.”</p>
<b>Response:</b> 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 2-7 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 3-5.		
2	Concerned about streambed stabilization structures.	“Does the preferred alternative for this new campground contain similar stabilization structures?”
<b>Response:</b> 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

LETTER NUMBERS	ISSUE # / SUMMARY	EXCERPTS FROM LETTERS
		of Monks Hollow creek.”
<p><b>Response:</b> 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.</p>		
3,4,5	Concerned that construction of the group site at the preferred location would convert temporary impacts to permanent impacts.	<p>“Construction of the group-site campground at the site will convert temporary impacts into permanent ones. These impacts need to be described and mitigated.”</p> <p>“...building a campground on this site would be a permanent loss of winter range [for deer and elk].”</p>
<p><b>Response:</b> 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 (page 3-50) 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 3-35.</p>		
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.”
<p><b>Response:</b> Pages 2-4 to 2-7 of Chapter 2 describe Forest Plan Standards and Guidelines that will protect wetlands. Impacts to wetlands are addressed in Chapter 3, starting on page 3-5.</p>		
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.”
<p><b>Response:</b> 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.</p>		

LETTER NUMBERS	ISSUE # / SUMMARY	EXCERPTS FROM LETTERS
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.”
<b>Response:</b> Impacts to wildlife have been reanalyzed in accordance with the 2003 Forest Plan. Refer to Chapter 3 starting on page 14.		
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.”
<b>Response:</b> Impacts to golden eagles are discussed on page 3-19. 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.”
<b>Response:</b> Pages 2-4 to 2-7 of Chapter 2 describe Forest Plan Standards and Guidelines that will protect disrupted areas from further disturbance. Page 2-17 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.”

LETTER NUMBERS	ISSUE # / SUMMARY	EXCERPTS FROM LETTERS
<p><b>Response:</b> 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.</p>		
4	Concerned that impact to NMB species is not discussed.	“any other NMB species of concern are not discussed at all.”
<p><b>Response: Refer to section ****update*****</b></p>		
4	Concerned that soils and water quality are not well enough addressed.	<p>“neither soils nor water quality is discussed in detail within the EA.”</p> <p>“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...”</p> <p>“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.”</p>
<p><b>Response:</b> Page 2-4 to 2-7 of Chapter 2 discloses Forest Plan Standards and Guidelines that will protect soil and water quality with implementation of this project. Page 2-14 states that toilets will be installed for all action alternatives, protecting Diamond Fork Creek from coliform bacteria. Impacts to water quality and soils are discussed in Chapter 3.</p>		
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.”
<p><b>Response:</b> 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.</p>		
3	Concerned with locating recreation sites in riparian	“We believe there are non-riparian areas where a group-site campground could be

LETTER NUMBERS	ISSUE # / SUMMARY	EXCERPTS FROM LETTERS
	areas when non-riparian areas are available.	accommodated. However, they are not located in lower Diamond Fork.”
<p><b>Response:</b> 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.</p>		
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.”
<p><b>Response:</b> The Forest Service has provided UEC with the requested document. The preferred alternative would provide 95 units accommodating 475 PAOT.</p>		
4	Concerned about the cumulative effect of providing developed camping adjacent to a motorized trail trailhead.	<p>“This will inevitably result in a huge increase in the number of ATV users recreating along the Monks Hollow Trail system.”</p> <p>“All of this can have significant cumulative consequences for deer, elk and other wildlife.”</p>
<p><b>Response:</b> 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 3-47.</p>		
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.”
<p><b>Response:</b> 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</p>		

LETTER NUMBERS	ISSUE # / SUMMARY	EXCERPTS FROM LETTERS
<p>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). In addition 49 dispersed camping sites were recently closed in Diamond Fork and 54 sites modified to improve wetland and riparian conditions. The developed camp sites will provide an alternative opportunity to some displaced users.</p>		
3	<p>Commenter questioned the discussion in the EA on the impacts of Tanner Ridge Tunnel on page 3.11 of the EA.</p>	<p>“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.”</p>
<p><b>Response:</b> 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</p>		



## **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



## REFERENCES

Belk, M, D. Olsen and M. Nannini. 2000. Effects of introduced brown trout (*Salmo trutta*) on native stream fishes of central Utah. Report submitted to the Utah Reclamation Mitigation and Conservation Commission. 102 West 500 South, #315, Salt Lake City, UT 84101.

DeGraff, R.M., V.E.Scott, R.H.Hamre, L.Ernst, S.H.Anderson. 1991. *Forest and Rangeland Birds of the United States*. USDA Forest Service Agriculture Handbook 688.

Diamond Fork Area Assessment. 2000. Utah Reclamation Mitigation and Conservation Commission/USDA Forest Service. Uinta National Forest. Agency report.

Final Report of Lower Diamond Fork Breeding Bird Surveys, 1996. Prepared by Elisabeth M. Ammon

Keller, Kent R., Raptor Consultant, 1996. Golden Eagle nesting Survey Report for the Diamond Fork Canyon pipeline Construction Project. Final report submitted to the Central Utah Water Conservancy District.

Michael Baker Jr., Inc. 1999. Diamond Fork Canyon Ute Ladies'-tresses (*Spiranthes diluvialis*) Year End Monitoring Report – 1999: An Analysis of Flows, Canyon-wide Population Counts, and Plant Demography. Report prepared for the Central Utah Water Conservancy District. Orem, Utah.

Sigler, William F. and Miller, Robert R. 1963. *Fishes of Utah*. Utah Department of Game and Fish. Salt Lake City, UT.

Sipes, S.D and V.J. Tepedino. 1996. The pollination and reproduction of *Spiranthes diluvialis*: implications for conservation of four populations. Report prepared for Uinta National Forest (Provo, Utah) and U.S. Fish and Wildlife Service (Salt Lake City, Utah).

Stokes, Donald and Lillian. 1996. *Stokes Field Guide to Birds*. Little, Brown and Company. Boston.

United States Department of Agriculture, Forest Service. 1991. *Threatened, Endangered, and Sensitive species of the Intermountain Region*. Ogden, UT.

United States Department of Agriculture, Forest Service. 1984. *Uinta National Forest Land and Resource Management Plan*. On file at the Supervisor's Office.

United States Department of Agriculture, Forest Service. 1993. *Uinta National Forest Land and Resource Management Plan Amendment*. On file at the Supervisor's Office.

United States Department of the Interior, Fish and Wildlife Service. 2001. Federally listed and proposed endangered and threatened species in Utah as of September 2001. Salt Lake City, Utah. Unpublished report. On file at the Spanish Fork Ranger District.

United States Department of Interior. Fish and Wildlife Service. 2001. *12-Month Finding for a Petition to List the Yellow-billed cuckoo (*Coccyzus Americanus*) in the Western Continental States*. Federal Register: July 5, 2001 (volume 6, number 143).

Utah Department of Natural Resources. Division of Wildlife Resources. 1998. *Inventory of sensitive vertebrate and invertebrate species and ecosystems*. [Internet]: <http://www.utahcdc.usu.edu/ucdc/ViewReports/Vertrpt.pdf>.

Utah Division of Wildlife Resources. 1997. Utah Sensitive List. UDWR, Salt Lake City, Utah.

Utah Reclamation Mitigation and Conservation Commission and U.S. Forest Service. 2000. Diamond Fork Area Assessment. 102 West 500 South, #315, Salt Lake City, UT 84101.

Walser, C. A., M. C. Belk, and D. K. Shiozawa. 1997. Abundance, distribution, and habitat use of Leatherside chub (*Gila copei*) in Diamond Fork Creek, Utah Co., Utah. Prepared for U.S. Forest Service, Spanish Fork Ranger Station, Spanish Fork, Utah.

Webb, M. 2001, 1999, 1996, 1995, 1994. Unpublished bird survey data. On file at the Supervisors Office.

Williams, Richard. 2001. Interoffice memo on the distribution of the Western yellow-billed cuckoo on the Uinta National Forest dated August 30, 2001.

## GLOSSARY

Sources for this glossary include *The Dictionary of Forestry*, edited by John A. Helms, *Webster's Third New International Dictionary*, Forest Service Handbooks and Manuals, the Draft National Planning Glossary, and the White Papers prepared for the Uinta National Forest.

### **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.