



**An Intuitive
Survey and
Site
Condition
Assessment
in the
Desolation
Canyon**

**National Historic Landmark,
Carbon County, Utah**

By

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Introduction

The archaeological resources found within the boundaries of the Desolation Canyon National Historic Landmark (NHL) remain largely unknown and poorly documented. A small number of sites were superficially described in a 1931 survey by the Peabody Museum at Harvard, and a several dozen more were identified through the course of oil and gas compliance and Bureau of Land Management monitoring activities associated with river recreation, mostly in the 1970s, 1980s and early 1990s. Nevertheless, the nature, density and distribution of cultural resources region remain largely unknown. Furthermore, federal land managers have little baseline data to determine the cumulative effects of nearly four decades of river recreation activities along the river corridor, or to understand the potential impacts resulting from oil and gas development on the western boundaries of the NHL.

Given the pressure on federal land managers to open the West Tavaputs Plateau to additional development, and the potential that these activities could facilitate access that could adversely effect archaeological resources within the NHL, the Colorado Plateau Archaeological Alliance (CPAA), the Antiquities Section of the Utah Division of State History and Abajo Archaeology conducted a joint intuitive reconnaissance of four tributary canyons to Desolation Canyon to ascertain the nature, density and distribution of archaeological sites, and to determine the nature and extent of adverse impacts. This reconnaissance was conducted from September 16, 2006, through September 24, 2006, and was focused primarily on Rock Creek Canyon and the confluence areas of [REDACTED] [REDACTED] Crews had intended to examine Jack Canyon, which now exhibits evidence of ATV access throughout, but this was abandoned due to time constraints precipitated by low water conditions on the Green River (it will be the focus of future research efforts).

The Desolation Canyon reconnaissance was conducted with three stated goals:

- (1) Augment the state archaeological database through re-identification and proper recording of known archaeological sites to IMACS standards, including the documentation of critical environmental variables.
- (2) Allow researchers to assess the impacts of recreational use of the river corridor and vandalism resulting from increased road access to the heads of side canyons.
- (3) Collect data that will contribute to a better understanding of prehistoric settlement patterns, population demographics and subsistence in the Desolation Canyon region, and to an understanding of the relationship of these sites to occupations in Range Creek and Nine Mile Canyons.

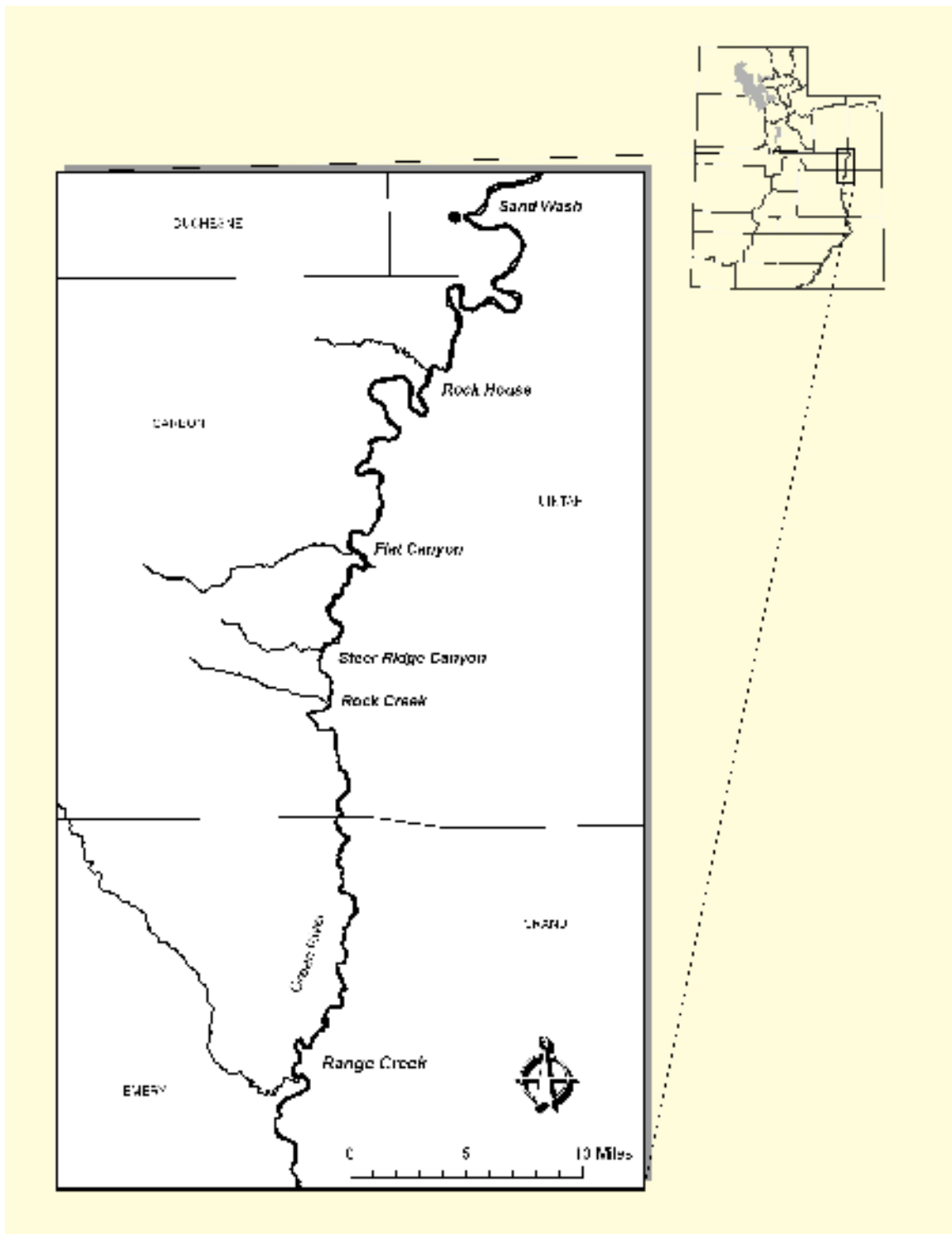


Figure 1: Desolation Canyon project area defined by Rock House Canyon on the north and Rock Creek Canyon on the south.

The reconnaissance subsequently identified and/or revisited [REDACTED]

[REDACTED] These included 10 previous recorded sites and 15 previously unrecorded sites, all of which were documented to IMACS standards. All sites were examined for evidence of vandalism or other deleterious human impacts. It was determined that many sites have been impacted to varying degrees over the years, but that most remain in good to excellent condition with little evidence of recent degradation. Most of the sites examined are near the confluences of side drainages where they are accessible primarily by watercraft. The high level of preservation evident at most of these sites can probably be attributed to good conservation ethic practiced by river-runners who visit the NHL.

The data collected also contributed to a better understanding of the nature and distribution of archaeological sites in the NHL. Based on sites identified, prehistoric occupations of the canyon corridor were evidenced by an abundance of masonry granaries and rock art locales, but an absence of evidence of permanent residences. There is also a notable paucity of artifacts suggestive of longer-term occupations. No lithic debitage, groundstone or potsherds of any kind were observed in [REDACTED]. It remains possible that permanent or semi-permanent residential sites were located along the broad alluvial plains, and that evidence of these occupations has been erased by periodic flooding of the Green River. It is also possible that residential occupations of the Green River corridor were ephemeral, reflecting seasonal horticultural activities and the subsequent storage of domesticated food resources that were periodically retrieved, as needed, by individuals wintering elsewhere on the Tavaputs Plateau. The presence of corncobs at some, but not all, storage facilities suggests the granaries were associated with Fremont horticultural adaptations. Rock art styles evident in the region, however, suggest a longer-term occupation of the canyon corridor that includes Archaic, Late Prehistoric and historic peoples.

Environment

At more than 90 miles in length, the Desolation-Gray Canyon corridor features a wide variety of geological formations, plant and animal species, and microenvironments that are unique to the largest navigable body of water in northeastern Utah. Generally speaking, the Green River splits the northeast-trending Tavaputs Plateau from north to south, carving a canyon that reaches depths of greater than a mile. The West Tavaputs Plateau on the west side of the Green River and the East Tavaputs Plateau on the east side feature environmental zones ranging from shadscale environments at lower elevations at about 4,000 feet elevation to alpine meadows at 9,000 to 10,000 feet.

Generally, the region is bounded by the Uinta Basin on the north and the Mancos Badlands on the south. Based on geological differences, the canyon corridor has been divided into two portions: the upper 59 miles from Sand Wash to Three Fords Canyon, referred to as Desolation Canyon, and the lower 35 miles from Three Fords Canyon to the town of Green River, Utah, referred to as Gray Canyon. Geological formations in the

Desolation Canyon portion of the corridor are primarily Tertiary deposits consisting of Green River and Colton Formation sandstones on the west and Wasatch Formation on the east. Those in Gray Canyon are primarily older deposits attributed to Cretaceous formations, including the Price River Formation, Bluecastle Sandstone Member, Blackhawk Formation and Castlegate Sandstone, with Mancos Shale formations in higher elevations on the east side of the river (Witkind 1988). The Gray Canyon formations are composed of lighter-colored sandstones from which the canyon derives its name. All formations in Desolation Canyon and Gray Canyon are highly susceptible to erosion, creating a wide array of arches, spires, hoodoos, alcoves, cliff faces and other spectacular topographic features (Figure 2).

The intuitive surveys of 2006 were conducted entirely on the west side of the Green River on the West Tavaputs portion of the plateau, and all surveyed areas are within the portion of the canyon formally known as Desolation Canyon. The West Tavaputs Plateau offers an intermixed assemblage of relatively barren deserts, riparian valleys, pinyon-juniper foothills and alpine forests. The local topography consists of friable sandstones, mostly lacustrine deposits attributed to the Tertiary period of geological history, with a south-to-north tilt characterized by dramatically deep canyons that ultimately drain into the Green River, usually from west to east.



The western and southern peripheries of the West Tavaputs Plateau are demarcated by the formidable escarpment of the Book Cliffs visible to motorists today as they travel U.S. 6 from Price to Green River. The West Tavaputs Plateau, situated behind the Book Cliffs escarpment, rises to elevations of more than 10,000 feet and is characterized by rugged, often impassable topographic features that could have inhibited transhumance and socioeconomic intercourse with peoples living in contiguous areas. The entire West Tavaputs Plateau lies within the northernmost extension of the Colorado Plateau physiographic province, and is subsumed within the Book Cliffs-Roan Plateau physiographic region (Stokes 1986). The Book Cliffs define the western and southern edges of the plateau, and they form the southern edge of the Uinta Basin section of the Colorado Plateau, as traditionally defined.

Figure 2: Desolation Canyon environmental overview

The deeply dissected canyons of the West Tavaputs Plateau are not impenetrable, but direct access to the plateau is limited to a handful of selected locations (e.g., the Green River corridor, Horse Canyon, Price River, Whitmore Canyon and Soldier Creek Canyon). Most evidence of aboriginal exploitation in this region was concentrated along narrow canyon environments with perennial streams like Nine Mile Creek, Range Creek and Rock Creek, and perhaps Price River, although the latter has never been comprehensively investigated.

The terrain above 5,000 feet elevation is rugged, steep and heavily vegetated, and the catchment area supports an array of indigenous flora and fauna. Those areas below about 5,000 feet, including the entire Desolation Canyon corridor, have sparse vegetation with the exception of a narrow riparian zone along permanent water sources. Diverse habitats include all the major biotic communities common to the northern Colorado Plateau. The taxa in Range Creek are found throughout the Four Corners region and the Rocky Mountains, and many are found along the eastern margin of the Great Basin.

Local Fauna

The fauna found on the West Tavaputs Plateau has been categorized as part of the Uinta Basin Province of the Northern Great Plains Faunal Area (Durrant 1952, 1963). The rich ecology of the plateau generally provides a premium habitat for game animals, including indigenous and introduced taxa. Sightings of deer, elk and bears are commonplace. Other fauna in the canyon include mountain sheep, turkey, coyote, mountain lion, bear, and bison. A wide variety of fish species, including channel catfish, blue-headed suckers, bullheads, carp, dace, squawfish, hump-back suckers, humpback chub and crayfish are found in the Green River and its western tributaries.

The broader Tavaputs Plateau ecosystem is home to more than 300 different taxa (mammals, birds, reptiles, amphibians and fish), most of which were probably exploited by prehistoric human populations for food, feathers, apparel, bone and shelter. Subsistence activities were probably focused on the procurement of specific, high-return resources, although some faunal resources were likely exploited opportunistically. Which faunal resources were intensively exploited, versus those that were procured incidental to other activities, cannot be determined from the available archaeological data.

Based on excavations in nearby Nine Mile Canyon (Gillin 1938; Thompson 1993), large fauna such as deer, elk, antelope and bison definitely were exploited. But these data may reflect a sampling bias because large faunal bones are better preserved in the archaeological record. Most fauna found in the region today are assumed to have been present in prehistoric contexts, although some species have been extirpated in historic times (e.g., wolf, grizzly bear). Other species like bighorn sheep, turkey and bison have been reintroduced in recent times. Bighorn sheep and wild horses were observed during the course of the 2006 intuitive surveys, and a large number of elk antler sheds were noted along the floodplain at the Flat Canyon confluence. Bighorn sheep, deer and elk are commonly depicted in the rock art of Desolation Canyon (Figure 3).



Figure 3: Elk figures (left) and sheep figures (right) common at Desolation Canyon petroglyph panels. Panel 3 at 42Cb2581, [REDACTED].

Of the more than 300 animal species recorded in the region (BLM 1980) fewer than two dozen have been documented in archaeological contexts on the West Tavaputs Plateau. This may be due to differential preservation; the small size of bone specimens, which prohibits species-level identification; comparative abundance of certain species; dietary preferences; and the spatial distribution of species due to fluctuating climates and corresponding changes in faunal habitats. It is also likely that morphologically similar species (e.g., white-tailed jackrabbits versus black-tailed jackrabbits) cannot be distinguished in the archaeological record. Some larger fauna like bear and moose are conspicuously absent from the archaeological record.

Bird remains are rare in archaeological contexts anywhere in the study area. Gillin (1938) reported the remains of grouse in Nine Mile Canyon, while Beckwith (1931) described sandhill crane rock art depictions, also in Nine Mile Canyon. Parmalee (1980) addressed ethnographic and archaeological evidence of exploitation of various bird species in Utah, although evidence from the Tavaputs Plateau was not available. Large numbers of ducks, geese, cranes and other waterfowl were observed along the Green River in 2006.

The exploitation of amphibians and reptiles is well documented among ethnographically observed Shoshonean populations. However, these remains are rarely recovered in archaeological contexts. According to museum records of the Utah Museum of Natural History in Salt Lake City, Julian Steward recovered dried lizards from a site in Nine Mile Canyon, but no report of these observations was written. Serpent rock art motifs

are common throughout the Tavaputs Plateau region, although the occurrence of headdresses on many of these snake-like figures may imply ideological rather than representational elements. Rock art depictions of snakes or serpent-like figures were identified in the Flat Canyon area (Figure 4).



Figure 4: Possible spiral figure (left) [REDACTED] at 42Cb2585 is similar to spiral snake figures in Nine Mile Canyon.

Local Flora

The vegetation of the West Tavaputs Plateau varies greatly according to elevation, aspect and soil type. Vegetation grades from a desert shrub community dominated by shadscale, greasewood, saltbush and grasses in lower elevations (less than 5,000 feet elevation) to a pinyon-juniper zone with sagebrush, rabbitbrush, greasewood and grasses at elevations of 5,000 to about 7,000 feet elevation. An alpine zone of aspens, firs, spruce, pine, mountain mahogany and meadows characterizes areas above 7,000 feet elevation. Riparian communities of cottonwood, box elder, willow, greasewood and tamarisk (BLM 1984, 1993) dissect all three vegetation zones (BLM 1980, 1992). Floral resources are predominantly taxa characteristic of the Upper Sonoran Life Zone. Although specific floral species vary greatly according to local environments, a catalog of species is similar to that of the eastern Great Basin (Goodrich and Neese 1986; Woodbury 1960), but with differences unique to the northern Colorado Plateau.

Due to lack of effective moisture and to high concentrations of salts in the soils, vegetation is sparse through much of Desolation Canyon and Gray Canyon, including the lower reaches of Nine Mile Canyon, Range Creek Canyon and lower Price River Canyon.

Vegetation is further hampered by heavy erosion of fragile shale and sandstone. The high salinity of these soils has favored halophyte species adapted to shallow soils and cold temperatures (Betancourt 1990:281). All plant species outside of the riparian zone are adapted to semi-arid climatic conditions.

For the purposes of this report, the West Tavaputs Plateau environment is divided into five zones, each reflective of different vegetation communities.

- The upper reaches of the plateau at the heads of the side drainages are encompassed within an “alpine” zone (8,500 to 10,300 feet elevation), which is characterized by mountain meadows, sagebrush, grasses, sedges, aspen groves and fir forests. The Douglas firs in this area grow to tremendous size and age, which have facilitated tree-ring studies in the past.
- The upper-middle reaches of the side drainages comprise a “transitional” zone (7,000 to 8,500 feet elevation), which is characterized by Douglas fir with an undergrowth of Mormon tea, snowberry, currant berry, serviceberry, mountain mahogany, bitterbrush, chokecherry, big sagebrush and Gambel’s oak. Douglas fir occurs on the steep canyon slopes, often in dense stands, as do occasional groves of aspen.
- The middle-lower reaches of the side drainages comprise the “pinyon-juniper” zone (7,000 to 5,000 feet elevation), which features a predominance of pinyon and juniper, often occurring in thick stands. Some of the pinyon trees have grown to tremendous size and can be mistaken at a distance for Douglas fir. This zone is clearly within the Upper Sonoran vegetation zone. Other common species include sagebrush (large and small), rabbitbrush, snakeweed, galleta grass, cheat grass, prickly pear, Gambel oak, serviceberry, chokecherry, Mormon tea, sego lily, sunflower and currant berry.
- The lower reaches of the side drainages are included in the “desert shrub” zone (5,000 to 4,000 feet elevation). This zone is characterized by sparse pinyon and juniper on the canyon slopes, as well as greasewood, saltbush, shadscale, blackbrush, Mormon tea, salt grass, small sagebrush, buffalo berry, rabbitbrush, small-spine yucca and other grasses and shrubs adapted to a water-stressed environment.
- A riparian zone is characterized by water-adapted species, usually within a distance of 100 meters of either side of permanent creeks and along the entire Green River corridor. These species include cottonwood, box elder, squawbush, currant berry, joint grass, willows, cattail, phragmites, wild rose and large sagebrush. Also associated with this zone is evidence of historic agriculture, including grasses characteristic of irrigated pasture lands, alfalfa, cheat grass and Russian thistle. Also of note, tamarisk is pervasive along the Green River corridor and to a distance of at least 10 kilometers up stream from western tributaries with permanent water.

Across the plateau generally, most evidence of prehistoric sedentism is found within 300 meters of riparian areas and within the delineation of the pinyon-juniper and desert shrub zones as described above (Spangler 1993; Spangler, Barlow and Metcalfe 2004). In addition to permanent water, riparian areas offered soils conducive to horticultural activities and abundant wild floral resources that may have been less affected by cyclical climatic changes. Major riparian resources would have been found along the Green River, as well as Price River, Nine Mile Creek, Range Creek and Rock Creek

Canyon. The 2006 intuitive surveys were conducted along the Green River riparian zone and the adjacent desert shrub zone, as defined above (Figure 5). A riparian zone was observed along the bottom of Rock Creek Canyon, where evidence of prehistoric residential activities was observed. It should be noted that a limited riparian zone was also observed along the bottom of Flat Canyon, suggesting a water supply adequate to support a sparse population of water-dependent plants.



Figure 5: Riparian zone along the Green River in Desolation Canyon at Flat Canyon confluence.

Hydrology and Climate

Hydrological patterns consisting of small rivers and streams, often in deeply eroded sandstone canyons, are characteristic of the northern Colorado Plateau. Climatological patterns are generally similar to winter-dominant rainfall patterns common to the northern Great Basin, but with strong influence from the Southwest's summer monsoon weather pattern. The variability in this summer monsoonal pattern likely influenced the viability of domestic crops during historic and prehistoric times. Although paleoenvironmental data from eastern Utah are scant, it is generally agreed that climatic conditions have remained fairly constant and any shifts in effective moisture and temperature have not been great enough to significantly alter the biological communities exploited by prehistoric populations. Fluctuations in the availability of local resources "may have occurred in response to minor climatic changes over time, [but] the floral and faunal species present in prehistoric times are assumed to have been essentially those available today" (Martin 1983:5).

Reconstruction of prehistoric environments is critical to an understanding of human subsistence and settlement patterns that were predicated to a greater or lesser degree on the

availability of biotic and hydrological resources that responded directly to climatic changes. In an area of chronically low rainfall, an increase of a few inches per year would result in marked increases in the density and/or distribution of flora and fauna. In an arid or semiarid environment, "such fluctuation in resources would have almost immediate consequences in the density and viability of the human population" (Jennings 1978:13). However, the concept of the natural environment as a variable shaping human adaptations has generated considerably more debate than it has consensus.

The paucity of paleoenvironmental reconstructions specifically conducted in West Tavaputs Plateau specifically hampers any comprehensive understanding of localized human adaptations to prehistoric climates and how those climates may have changed through time. The climate of the West Tavaputs Plateau is as varied as its topography, but it can be generally described as arid or semiarid. Across the region, annual precipitation ranges from 6 inches in the southern deserts to 25 inches in upper reaches of the plateau. In both regions, precipitation increases with elevation and the number of frost-free days decreases proportionally (BLM 1980:1).

The region is situated on the climatic transition zone between the winter-wet/summer-dry zone to the west and north, and the summer-wet/winter-dry zone to the south and east. The seasonal shift of the jet stream to the north in the summer and to the south in the winter produces distinctive seasonal patterns of precipitation in the western United States (Hidore and Oliver 1993). Located on the northern periphery of the summer-wet greater Colorado Plateau, the Tavaputs Plateau would be affected by even minor shifts in the jet stream.

In the winter, the jet stream is positioned over the northern tier of the western states, and the jet stream tracks eastward over California, Washington and Oregon and into Utah, Colorado, Wyoming and Montana, dropping their moisture on the Rocky Mountains. These storms generally have little moisture after crossing the Wasatch Plateau. In the summer, the jet stream migrates northward, producing a stronger onshore flow along the Gulf of Mexico and the Gulf of Cortez. This results in frequent summer convectional thunderstorms throughout the Colorado Plateau, including the Tavaputs Plateau. Historic records relevant to the Tavaputs Plateau indicate more precipitation falls during the summer months than during the winter months, reflecting the summer monsoonal weather patterns characteristic of the Colorado Plateau. Most precipitation occurs from May through August, except at higher elevations where heavy snows accumulate during the winter months.

Throughout the region, droughts occur on average once every five years and usually last one or two years. Temperature patterns vary widely according to the diverse topography. Summer temperatures above 90 degrees Fahrenheit are common throughout the region, whereas winter temperatures of less than 10 degrees Fahrenheit are typical. The Green River area on the southern periphery of the Tavaputs Plateau experiences the widest extremes, with temperatures ranging from -42 degrees to +112 degrees Fahrenheit, a phenomenon attributed to the dry air and valley exposure (BLM 1980:2).

The pattern of cyclical droughts is assumed to have been evident during prehistoric times, although there is little empirical data to support this assumption. However, tree-ring studies from samples collected in the Sunnyside and Nine Mile Canyon concluded that drought sequences in the West Tavaputs Plateau were virtually identical to the Greater Southwest. In effect, "there is about as much general variation in chronology between Mesa Verde and Nine Mile Canyon some 200 miles to the north-northwest as between Mesa Verde and southern Arizona some 350 miles to the south-southwest" (Schulman 1948:14). It can be postulated that prehistoric climatic patterns were similar across broad geographic regions of the Southwest, and that paleoenvironmental reconstructions for the Greater Southwest may be applicable to the Tavaputs Plateau. Ongoing dendroclimatological studies in the West Tavaputs Plateau could shed considerable light on this issue (Andrew Yentsch, personal communication 2007).

Summary

Effective human exploitation of plant and animal resources in a marginal desert environment would have required intimate knowledge of a large geographic area, probably encompassing several hundred square miles and a full range of ecozones. The hunting and collecting of terrestrial plants and animals would have focused on many edible species as each was in season (Jennings 1978:15). As discussed by Bye (1972), Harrington (1967), Kelly (1964) and others, ethnographically observed populations utilized virtually all flora and fauna to some extent, and most, if not all, resources offer some nutritional, pharmaceutical or functional values.

Consequently, the problem facing archaeologists in the region is not whether prehistoric populations exploited certain species. Rather the question should be which species could be procured efficiently and economically, and which were opportunistically exploited versus systematically exploited. Furthermore, questions as to how this procurement occurred, how changes in climate precipitated changes in the distribution of biotic resources, and how human populations responded to increasing or diminishing resources remain largely unexplored in the Tavaputs Plateau region.

The distribution of biotic resources has been well documented in the region generally, primarily in a series of environmental impact statements, including the *Book Cliffs Resource Management Plan* (BLM 1984), the *Diamond Mountain Resource Area Resource Management Plan* (BLM 1993), and the *Price Field Office Resource Management Plan*, soon to be released. Also relevant to this discussion is the environmental impact statement for the Ouray to Interstate 70 highway project (BLM 1992) that offers valuable data for the environmentally similar East Tavaputs Plateau to the east of the study area.

Previous Research

The archaeological resources found through the East and West Tavaputs Plateaus have long intrigued archaeologists, antiquarians and enthusiastic amateurs since the first Colorado River Exploring Expedition of 1869 made passing references to indigenous remains along the Green River. Most early interest clearly focused on Nine Mile Canyon

on the West Tavaputs Plateau, and Hill and Willow Creek Canyons on the East Tavaputs Plateau, all of which featured an abundance of spectacular masonry architecture (Figure 6). To a lesser extent, archaeologists also focused on Range Creek Canyon on the West Tavaputs Plateau, and Chandler and Florence Creek Canyons on the East Tavaputs Plateau, although these canyons were less accessible. Given its remote inaccessibility, very little scholarly attention was focused on the archaeological resources found along the Green River in what is today known as Desolation and Gray Canyons. And even with decades of compliance activities associated with oil and gas development in the region, fewer than 100 sites have been recorded along the 90-mile-long corridor and side drainages. The paucity of data is further augmented by the fact that no significant reports have been written about the cultural resources of this region and how they might relate to the better-known archaeology described in Nine Mile Canyon and Range Creek Canyon.



The first substantial references to archaeological remains in the Tavaputs Plateau were those made by participants in the landmark 1869 and 1871 Colorado River Exploring Expeditions, both commanded by John Wesley Powell. According to 1869 journal accounts, the expedition reached the Desolation Canyon area in early July 1869 (Bradley 1947:46; Powell 1947:125; Sumner 1947:113). A July 7, 1869, entry states that Bradley climbed a hill on the west side of the Green River to take height measurements and

... found on one of them a pile of rocks placed as children call cob-house. Think it is the work of Indians for I could not find names or letters on any of the rocks. I re-piled them and added a long rock, over seven feet, which I placed on end and made very secure. I also put my name on a flat stone with name

of expedition and date and fastened it up very strong [Bradley 1947:46].

Figure 6: Claflin-Emerson Expedition investigating site on East Tavaputs Plateau in 1931. Photo courtesy of the Peabody Museum, Harvard University (U-31-784).

The pile of rocks so described is likely one of the large rock cairns common in Desolation Canyon and its Green River tributaries (Figure 7). These cairns are usually located on canyon rims, outcrops or precipices 70 to 170 meters above the valley floor, and are likely prehistoric, based on their associations with prehistoric architecture in lower Nine Mile Canyon (Spangler 1993). The function of these prehistoric cairns is problematic. Similar prehistoric cairns were observed in the Texas-Missouri Creek area of northwestern Colorado, where researchers concluded,

It is unlikely that the cairns served as prehistoric/historic locational reference points because they do not appear to be aligned with any prominent topographic feature, and they are too low to be seen from a distance.... The cairns may possibly represent the remnants of a game drive used to channel animals over the precipice on the eastern edge of the ridge feature. Because the cairns are so low, they may possibly have been used as foundations to support a brush enclosure or structure [Gordon et al. 1983:67].



The cairns observed by the Colorado River Expedition of 1869 could have been one of three large dry-laid cairns (42Un1931, 42Un1932 and 42Un1933) overlooking Desolation Canyon [redacted], but this is speculative.

Journal accounts of the 1871 Colorado River Exploring Expedition contain more references to archaeological resources in the Tavaputs Plateau. On August 8, 1871, Steward described climbing a cliff about 600 feet high and finding a small niche. "Across the opening was laid a low wall, of some little height and 4 feet in length, made of stones about as large as a brick, but varying in length" (1948:213). Dellenbaugh also described the wall, calling it the "first work of the ancient builders we had encountered," adding that the expedition attributed the site to the "ancestors of the Moki" (1908:79). Clem Powell wrote that Steward also visited the "remains of a buried city back from camp [probably in Hill Creek]. A well is all that remains"

Figure 7: Cairn (42Un1933), Desolation Canyon

buried city back from camp [probably in Hill Creek]. A well is all that remains"

(1948:295)

Francis Marion Bishop's journal indicates the party camped in a cottonwood park near the mouth of Nine Mile Canyon on August 17, 1871 (the earliest reference to the name "Nine Mile Canyon"), during which time he collected an arrowhead at the mouth of the canyon (1947:190-191). On August 20, 1871, while encamped in the vicinity of Chandler Creek, Steward commented on the abundant groundstone tools along the river.

One of their mills, or grinding stones, was found at our Friday night's camp. These mills are usually from 3 to 4 inches in thickness, and about 18 by 24 inches in breadth and length. For these they selected a coarse sandstone, and by abrasion depressed the surface at the center, and then with another stone the grist was ground [Steward 1948:221].

The two expeditions made only passing references to the prehistoric remains of Desolation and Gray Canyon. It appears the Desolation Canyon region was not revisited with archaeological intentions until 1931 during the final year of the Claflin-Emerson Expedition sponsored by the Peabody Museum at Harvard University. This expedition was directed by Donald Scott, then assistant director of the Peabody Museum, with John O. Brew as his technical assistant, with Alfred V. Kidder II, William Bowers, Waldo Forbes and James Dennison, among others, participating (Gunnerson 1969:24).

The final field season of the Claflin-Emerson Expedition started from Green River, Utah, in early July 1931 and proceeded north up the east bank of the Green River and across the East Tavaputs Plateau through Grand and Uintah counties. Crude stone and adobe granaries were noted in Florence and Chandler Canyons, as were some rock art sites. The expedition described seven sites in the Florence and Chandler Creek areas, all of which appear to have been storage structures situated on cliff ledges, alcoves and niches (Scott 1931:2-5).

The expedition crossed the Green River on the Muse Ferry (Figure 8) just north of Nine Mile Creek (Scott 1931:6), and it then proceeded to the Pace Ranch (42Dc644) in lower Nine Mile Canyon between the North Maxie and Bull Canyon tributaries. After an unspecified amount of time surveying Nine Mile Canyon between the Pace Ranch and Dry Canyon to the west, the expedition split into three groups. One group continued surveys in the middle portion of Nine Mile Canyon, and another explored the upper reaches of Nine Mile Canyon. A third group left the Pace Ranch for a two-week reconnaissance, proceeding up Cottonwood Canyon, across the plateau at Willow Springs, down Range Creek to its mouth, then north along the west bank of the Green River (1931:7).

The Range Creek party, which consisted of Dennison, Forbes and Bowers, explored Bear, Snap, Calf and Rock canyons, turned westward up Steer Ridge to the headwaters of Flat Canyon, then east down Jack Canyon and back to the west to the Pace Ranch through Rock House Canyon, all on the West Tavaputs Plateau. This reconnaissance constituted the first archaeological research in the Desolation Canyon area. Eight sites were described in

Green River tributaries in Desolation Canyon, and 20 additional sites were described in Range Creek Canyon. Their reconnaissance revealed a continuation of the same types of rock art as found in Nine Mile Canyon, as well as an abundance of adobe granaries with jacal roofs, although very few open sites were encountered (Scott 1931:10). This reconnaissance also resulted in the first photographs of archaeological resources in the Desolation Canyon region, although these have never been published (Figure 9).

The archaeological resources of the region, in particular the rock art, also drew a fair number of enthusiastic amateur and pseudo-archaeologists to the region. Albert Reagan, a teacher in the U.S. Indian Field Service in Ouray, Utah, initiated numerous archaeological investigations in Nine Mile Canyon on the West Tavaputs Plateau and Hill, Willow Creek, Florence and Chandler Creeks on the East Tavaputs Plateau. These investigations were conducted primarily under the auspices of the laboratory of Anthropology in Santa Fe, New Mexico. Reagan stated his intention to visit sites in Desolation Canyon in 1934, but no mention was made in his subsequent reports of any sites in this region. He had earlier visited sites in Florence and Chandler Creeks and may have extended his survey to the Green River, but this is unclear.

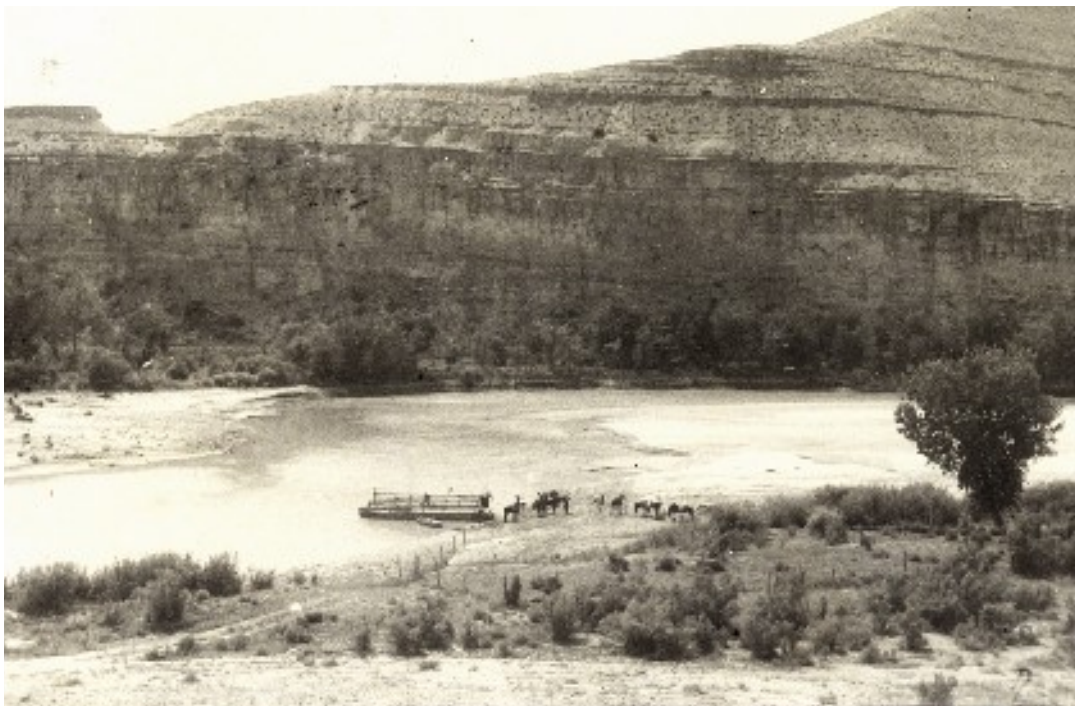


Figure 8: Claflin Emerson Expedition crossing the Green River on Muse Ferry near present day Sand Wash. This crossing typically marks the beginning of Desolation Canyon

Also in 1934, Leonard Leh conducted a superficial reconnaissance by horseback through Range Creek Canyon, departing by way of Gray Canyon. Leh's report (Leh 1937) described numerous sites in Range Creek, but it is silent on the resources observed along the Green River as the expedition traveled along the west bank to the town of Green River, Utah. This would have been the same year that Alfred E. Gaumer (institutional affiliation unknown) conducted excavations at an undetermined location in Desolation Canyon. Three rock shelters and one room in a "slab-house ruin" were excavated, as was a series of small

caves and rockshelters. Gaumer reported "numerous burials in slabrock-lined cists, typical of the Basketmaker culture" (1939:139), including one of an infant in a cradle.



Figure 9: Claflin Emerson photograph taken in 1931 of rock art site located on the west bank of the Green River 2 miles above Chandler Canyon. Photo courtesy of Peabody Museum (U-31-302B).

Gaumer surveyed several side canyons, and "numerous petroglyphs were found; these depicted mountain sheep, deer, coyotes and the triangular-bodied human figures and zigzag lines commonly associated with the Basketmaker culture" (1937:160). He also noted the fine state of preservation of the rock art and how the region had not yet been significantly impacted by vandals. One cave that had been vandalized was located in a side canyon. While sifting through the debris they "salvaged several fine specimens of rabbit snares and clay figurines" (1937:161).

Gaumer also investigated a cave about 36 feet wide, 26 feet deep and 6 feet high, with a roof blackened with soot. One floor level was noted at a depth of about 6 inches, and a second-floor level at a depth of about 32 inches. At the second level, a small bone awl, fragments of tanned hide, fiber strings, stone chips, broken bones and other items were recovered. In a small circular cist inside the cave, excavators removed a basket made of split willow-root, a reed bag containing a complete set of flaking tools and an exceptionally fine chert knife. The basket contained unworked chert, several completed and broken atlatl points, two scrapers and a single black bean. "Hitherto we had found only a single type of flint corn. During the days that followed we eagerly sought other beans, but none was found" (Gaumer 1937:164). Though grayware and black-on-white potsherds were located at a spring 500 feet away from the cave, no potsherds were located in the cave itself.

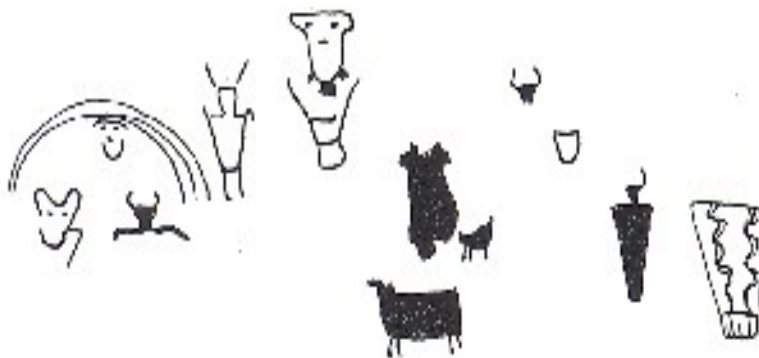
Also located in the cave was a conical basket 18 inches high and 14 inches in diameter at the base and waterproofed on the inside with pinyon pitch. Interred next to a log and lying upon a juniper-bark mat was the desiccated "mummy of a child about 12

years, with which had been placed a puppy. A digging stick lay at the side of the dog, and at the child's feet was a small coiled basket" (Gaumer 1937:164). The body was buried in a flexed, cross-legged position, and it was so well preserved that toe and finger nails were still intact. The only other grave item mentioned was a necklace 11 feet long, draped in eight coils with the original sinew in place and 2,771 beads consisting of slate, white bone and a single red stone (1937:164-165).

There is no indication Gaumer ever returned to Desolation Canyon, although he intended to do so (1937:165). Gaumer also mentioned the site was photographed, measured and studied, and the brief report pays unusual attention to stratigraphic context. The current location of notes, photographs and artifacts recovered by Gaumer is unknown. However, it is possible the materials were destroyed. In a subsequent report, Gaumer made reference to a house fire that destroyed the cradle burial (1939:140). The location of his investigations has not been established.

Particularly intriguing is Gaumer's reference to the necklace, which appears nearly identical in size and construction to a necklace recovered by collectors from Rasmussen Cave in Nine Mile Canyon in about 1931. Frank Beckwith, a newspaper publisher from Delta, Utah, mentioned that two weeks before he had arrived in Nine Mile Canyon in 1931 a "party had dug in a cave at the Rasmussen property, and found a tiny mummy which was resting upon a coarsely woven mat of cedar bark" (1931:220). "A most wonderful find" was a necklace eleven feet long, consisting of 2,750 cut-to-size, bored, and polished stones of a shiny black, varied with a thin, shell-like white (1931:221). Both necklaces are similar to necklaces recovered from burials at Steinaker Reservoir in the Uinta Basin that produced radiocarbon dates at about A.D. 250 (Talbot and Richens 1996).

The inaccessibility of Desolation Canyon was apparently a deterrent to significant archaeological investigations after that time, and there is no clear evidence the canyon was visited by archaeologists with scientific intent until the 1970s. Polly Schaafsma's "Survey Report of the Rock Art of Utah" discussed the Flat Canyon rock art site (42Cb79) at its confluence with the Green River (1970:36), but she did not visit the site, instead relying on local informant Barry Cushing. In her subsequent monograph "Rock Art of Utah" she illustrated a rock art site in Rock Creek (Figure 10), but there is no indication she actually visited the site (1971:31).



A second attempt to describe the rock art of Desolation Canyon was initiated by Kenneth Castleton, who described 13 rock art sites along the Green River between Sand Wash and the Price River confluence. Drawings and photographs were

Figure 10: Schaafsma's Figure 28 from Rock Creek (1971:31)

included for about half of the sites, but the site descriptions were minimal. In Desolation and Gray Canyons, Castleton described a panel at Rock House Canyon that contained depictions of quadrupeds and a stylized anthropomorph with a phallus. He also described an abstract panel at Jack Creek and complex panels at the mouth of the Price River and Flat Canyon (1984:94-105), the latter of which (42Cb79) was re-documented in 2006. Castleton's study resulted from visits to the described sites in 1973 and 1976 (1984:105), and the report appears to be the first to illustrate sites from Desolation Canyon (Figure 11).



The designation of the Desolation Canyon National Historic Landmark on November 24, 1968, prompted a renewed interest among federal land managers in the cultural resources of the region. The first extensive survey of the entire canyon drainage was conducted in 1975 by BLM state archaeologist Richard Fike with the stated intent to "arrive at an effective understanding of the diversity, distribution and density of cultural resources along the Desolation and Gray Canyon portions of the Green River" (Roberts n.d.).

The initial BLM survey was directed at all accessible benches and terraces along the Green River entrenchment, as well as the approximately 50 side canyons and tributaries, each of which was surveyed to a distance of one-half mile. The survey method was described as extensive, rather than intensive, because transects at consistent intervals were not employed. "But the surveyors believe that very few if any sites were missed in all of the areas examined" (Roberts n.d.), a naively optimistic assessment not shared by all participants (Shelley Smith, personal communication 1992; Bruce Louthan, personal communication 1992). The findings of the 1975 survey were never published, **Figure 11: Castleton's Site 10 near**

Chandler Creek (1984:99-100)

although Heidi Roberts examined the data in the 1980s and drafted a report that, although never completed, provides descriptions of the sites encountered.

The 1975 survey recorded a total of 66 historic and prehistoric sites, 55 in Desolation Canyon and 11 in Gray Canyon. Those sites included 25 rock art sites, eight storage sites, eight sand dune camps, six rockshelter camps, four structures of unknown function, three structural habitations, three lithic scatters and two historic structures. Also, the survey noted one quarry, one ceramic-lithic scatter and one open camp. Only diagnostic artifacts were collected, although no mention was made as to where the artifacts were deposited. Areas around the Price River and Range Creek confluences were not surveyed (Roberts n.d.).

Surveyors noted a lack of permanent masonry structures, a contrast to the ubiquitous drylaid masonry architecture common throughout the primary tributaries to the Green River. Only three of the 66 sites recorded were classified as habitations, and none featured extensive middens that would indicate long-term occupation. One site was described as a masonry room with an associated granary and a petroglyph. The remaining two sites were described as pithouses. Diagnostic ceramics were found on two habitation sites, but the type of pottery was not indicated. Pottery was noted at three other open camp or rockshelter sites, "but is surprisingly scarce throughout the study area" (Roberts n.d.).

Site descriptions were generally scant, but it appears they reflected settlement patterns consistent with other areas of the Tavaputs Plateaus. Habitation sites were located on alluvial terraces near permanent water, often at the mouths of side canyons. Rock art was generally located on canyon walls near the valley bottoms and was also concentrated at the mouths of side canyons. Storage structures were typically located in small rockshelters and alcoves at varying distances from the valley floor. The survey also noted prehistoric utilization of sandbars along the Green River, a pattern not observed in the Green River tributaries where sand dunes are rare (Roberts n.d.).

Other BLM-initiated in-house, non-systematic monitoring surveys followed in 1975, 1976, 1982 and 1987, and there appears to have been a particular focus on the resources found in Rock Creek Canyon. A total of 18 archaeological sites were recorded in the drainage, including eight rock art panels, five granaries, four rockshelters and one open artifact scatter. The rockshelter sites contained masonry features that were described as granaries or, in two cases, possible habitation features. All of these sites were located either along the talus base or the lower cliff terraces of Rock Creek.

Another BLM attempt to document the canyon's cultural resources was initiated in September 1992. It was designed to place the original survey data within a regional context, determine gaps in the original survey data and monitor recreational impacts on archaeological sites. Some 23 previously recorded sites (12 rock art, one burial, six storage structures/granaries, three habitation, one historic and one open campsite) and seven newly recorded sites (four rock art, two storage structures and one habitation) were visited. In

addition, the Rock Creek homestead, a cache of historic mining equipment and an abandoned iron-prow skiff were visited. Each site was photographed and evaluated, and researchers concluded that archaeological sites located along the Green River corridor are currently not being significantly impacted by river users (Spangler 2002).

A few exceptions were noted, however. For example, Last Chance Burial (42Cb1103) exhibited evidence of considerable recreational visitation. Numerous human bones, originally observed by river rangers in protective caches, were missing from the collection, suggesting that osteological materials had been stolen. River rangers also reported that artifacts present at other prehistoric sites have disappeared with regularity (Ellen Meloy, personal communication 1992; Mark Meloy, personal communication 1992).

Attempts to correlate site distribution patterns in Desolation and Gray Canyons with those noted in western tributaries were largely unsuccessful due to the non-intensive nature of the survey and time constraints. However, general site distribution patterns evident in Nine Mile Canyon were observed along the Green River corridor. Among them, rock art sites were clustered at the mouths of side canyons. Habitation sites of drylaid stone masonry tended to be located on terraces overlooking permanent water sources. Storage structures were usually located in cliff faces and were constructed of slabstones set in adobe mortar, sometimes with a wooden superstructure. Room blocks of undetermined function occupied cliff ledges overlooking the main canyon. There was also a notable lack of ceramics in association with the prehistoric sites.

According to field notes, several differences were noted between the distribution of sites in Nine Mile Canyon and those in Desolation Canyon. There was a significant lack of substantial habitation sites observed in Desolation Canyon, and those noted exhibited generally poor construction. Most habitation sites in Desolation Canyon exhibited the ubiquitous drylaid masonry construction style common throughout the Tavaputs Plateau. Copious amounts of red adobe were observed on the back walls of one large dwelling site in a protective alcove (an unrecorded site), implying that adobe mortar may have been a feature on other surface structures but that the adobe has since eroded. These findings were summarized in a general overview of the region (Spangler 2002), but a formal report was never completed.

Likewise, a report initiated on a subsequent 1995 reconnaissance that identified numerous sites in the Lion Hollow area was not completed. In fact, no significant report has resulted from any BLM monitoring activities. Numerous small oil and gas clearance surveys have been conducted in the Jack Canyon side drainage, and various state land sales in the region have precipitated investigations in the upper side drainages (Benson and Simms 2006; Mrstick and Patterson 2004). Additionally, a 1977 Class II survey examined 29 quarter-sections throughout the West Tavaputs Plateau, of which only five had archaeological sites (Hauck 1979:215). None of these investigations offered an interpretive discussion of the spatial or temporal nature of the sites. The results of these surveys are summarized in Table 1. Previously recorded sites in the Desolation Canyon corridor that are not associated with specific surveys are indicated in Table 2.

Table 1: Previous archaeological surveys

project number	Location	Sites	Project Title	Acres surveyed
U02ME0564	Jack Creek/Cedar Ridge	42CB89, 241, 1298, 1710-1731, 1734-1735, 1737-1754, 1819-1821	Dawson Stone Cabin 3D	4030.2
U04MQ0739	Jack Creek/Cedar Ridge		BBC Stone Cabin Seismic Jack Canyon and Rims Survey	2051
U04MQ1472	Sand Wash		Samson Resources' 6 Wells in T11S, R18E	178.9
U06MQ0694	Jack Creek/Cedar Ridge		BBC's Peter Point 14-8-13-17 Well Location	11.7
U77AF0005	Rock Creek and Desolation Canyon		Central Coal Project	49760
U78AF0111	Desolation Canyon, south of Range Creek	42CB132-133	3 SSC Seis Lines & Other Facil. Green River	
U79AF0441	Jack Creek/Cedar Ridge		4 Seis Lines vic Jack Creek /Cedar Ridge	72 (R)
U79BL0312	Sand Wash		Airstrip Survey Near Nine Mile Canyon	
U79PA0474	Jack Creek/Cedar Ridge		Peter's Point #15	40
U80BL0709	Rock Creek		Cultural Investigation for Rock Creek Streambed	12
U81BL0334	Sand Wash		9 Mile Building Stone Survey	40 (R)
U82AK0649	Jack Creek/Cedar Ridge	42CB132	2 Drill Holes vic Jack Creek/Cedar Ridge - 42Cb132 Test	23
U83BC0243	North of Range Creek	42EM1766	2 Seis Lines in Range Creek Area - Rocky Mountain Geophysical	258 (R)
U89AF0685	South of Range Creek		6 Seismic Lines vic. Big Horn Mountain	284
U90BL0497	Sand Wash		Sand Wash Drift Fence	
U91BL0654	Range Creek	42EM2254	Range Creek Closure	1

Table 2: Previous recorded sites in Desolation Canyon (no official project)

Smithsonian Trinomial	General Location	Smithsonian Trinomial	General Location
42CB000076	Desolation Canyon	42CB002586	Flat Canyon
42CB000079	Flat Canyon	42CB002587	Flat Canyon
42CB000080	Rock House Canyon	42CB002588	Flat Canyon
42CB000081	Desolation Canyon	42CB002589	Flat Canyon
42CB000082	Desolation Canyon	42CB002590	Flat Canyon
42CB000083	Flat Canyon	42UN000063	Sand Wash
42CB000161	Desolation Canyon	42UN000137	Sand Wash
42CB000215	Rock House Canyon	42UN000229	Sand Wash
42CB000216	Rock House Canyon	42UN000230	Sand Wash

42CB000218	Desolation Canyon	42UN000349	Sand Wash
42CB000219	Desolation Canyon	42UN000423	Sand Wash
42CB000220	Flat Canyon	42UN000424	Sand Wash
42CB000221	Flat Canyon	42UN000427	Desolation Canyon
42CB000222	Flat Canyon	42UN000446	Desolation Canyon
42CB000223	Rock Creek	42UN000464	Sand Wash
42CB000224	Rock Creek	42UN000513	Sand Wash
42CB000225	Desolation Canyon	42UN001908	Sand Wash
42CB000226	Desolation Canyon	42UN001912	Sand Wash
42CB000227	Desolation Canyon	42UN001913	Sand Wash
42CB000231	Desolation Canyon	42UN001914	Sand Wash
42CB000233	Desolation Canyon	42UN001915	Sand Wash
42CB000234	Desolation Canyon	42UN001917	Sand Wash
42CB000235	Rock Creek	42UN001918	Sand Wash
42CB000236	Rock Creek	42UN001919	Sand Wash
42CB000416	Rock Creek	42UN001920	Sand Wash
42CB000417	Rock Creek	42UN001921	Sand Wash
42CB000441	Flat Canyon	42UN001922	Sand Wash
42CB000556	Rock Creek	42UN001923	Sand Wash
42CB000557	Rock Creek	42UN001924	Sand Wash
42CB000558	Rock Creek	42UN001925	Sand Wash
42CB000653	Desolation Canyon	42UN001926	Sand Wash
42CB000655	Desolation Canyon	42UN001927	Sand Wash
42CB000656	Desolation Canyon	42UN001928	Sand Wash
42CB000658	Desolation Canyon	42UN001929	Sand Wash
42CB000711	Desolation Canyon	42UN001930	Sand Wash
42CB000712	Desolation Canyon	42UN001931	Sand Wash
42CB000713	Desolation Canyon	42UN001932	Sand Wash
42CB000755	Desolation Canyon	42UN001933	Sand Wash
42CB000756	Desolation Canyon	42UN001934	Sand Wash
42CB000757	Desolation Canyon	42UN001935	Sand Wash
42CB000758	Desolation Canyon	42UN001938	Sand Wash
42CB000759	Desolation Canyon	42UN001939	Sand Wash
42CB000760	Desolation Canyon	42UN001940	Sand Wash
42CB000761	Desolation Canyon	42UN002027	Sand Wash
42CB001103	Desolation Canyon	42UN002028	Sand Wash
42CB002581	Rock House Canyon	42UN002029	Sand Wash
42CB002582	Flat Canyon	42UN002030	Sand Wash
42CB002583	Flat Canyon	42UN002031	Sand Wash
42CB002584	Flat Canyon	42GR003271	Desolation Canyon
42CB002585	Flat Canyon	42GR003272	Desolation Canyon

Survey Results

The Desolation Canyon reconnaissance was conducted by two separate survey parties, one entering the canyon via river rafts and the other arriving by horseback through Rock Creek Canyon. The river group departed Sand Wash on September 16, 2006,

proceeded to the mouth of Flat Canyon, arriving on the evening of September 17 and conducting surveys around the confluence from September 18 to September 20.

All six previously identified sites in this area were re-documented, and nine additional sites were recorded.

The horseback contingent of nine individuals departed the Tavaputs Ranch at the head of Rock Creek on September 18, descending into Rock Creek via the Van Dusen Trail. One previously recorded site (52Cb557) and three unrecorded sites were investigated. The horseback party then traversed the Son-of-a-Bitch Trail along a terrace above the west bank of the Green River to the , where one previously recorded site (42Cb225) and one unrecorded site were investigated. The contingent departed Desolation Canyon via the Steer Ridge Trail on September 23, and no additional sites were observed within the narrow canyon

were entirely intuitive and did not involve any systematic examination of the drainage. The spatial extent of the reconnaissance was instead determined by the desire to (1) document a large rock art site that is a popular destination among river-runners but which had never been formally recorded, (2) relocate a granary initially described by the Claflin Emerson Expedition in 1931, and (3) identify and better document two previously recorded sites near the confluence. was investigated to a distance of more than 2.5 kilometers from the confluence in an effort in an attempt to locate the Claflin Emerson site. Both previously recorded sites were identified and documented, and one of them may be the Claflin Emerson site, although this remains undetermined. The previously unrecorded rock art panel popular among river visitors was also documented.

42Cb215. Located confluence, this rock art site was first described in 1975 by Bruce Louthan as "1 circle (12 centimeters diameter), 1 faint horseshoe shape -- not completed and 1 historic imitation quadruped. Greasewood and June grass cover in open canyon mouth position of rock

vertical; pecking slightly irregular and slightly varied in size." The panel was described as about 1.5 by 1.5 meters in size. Upon revisiting the site in 2006, the panel was found to be in the same condition as described in 1975, and no further features were noted. The circle was described as 12 centimeters by 10 centimeters, the horseshoe shape as 22 by 30 centimeters and the quadruped 8 by 6 centimeters. The circle and horseshoe were pecked, whereas the quadruped appeared to have been chiseled into the rock face. A comparison of the site photograph from 1975 to the present (Figure 12) indicates that the top of the circle has eroded. There were no indications as to the age of the images. The quadruped image appears older, but it also appears to have been made with a metal chisel. The circle and horseshoe figures appear recent, based on the lack of any repatination. The original site form assigned this site to the "aboriginal" time period, but it appears that it may have been done by Protohistoric or historic peoples.



Figure 12: Views of ephemeral rock art images at 42Cb215.

42Cb216. [REDACTED]

[REDACTED], this site was described in 1975 by William Lipe as a "small mortared masonry granary. Walls up small covelet at SW end of larger ledge shelter. Upper courses of wall tumbled, lowest 1-2 courses in place." The original site form also makes reference that this site is PR-8-4 (Gunnerson 1969) recorded by the Claflin Emerson Expedition in 1931. This notation is inaccurate given that PR-8-4 is a rock art site located in Jack Canyon. But it possibly could be PR-8-3, described as

[REDACTED] on a ledge 50 feet above the creek is a granary. The approach is up a gradual sage-grown slope; then a steep slope of broken stones and then a 25-foot vertical sandstone face. The ledge extends 25 meters to the east and the granary is reached by climbing to this eastern end. At the point where the granary is situated the ledge projects about 2 meters from the back wall. The back wall makes a right angle corner to terminate the ledge 1 meter to the west of the west side of the granary, which is semicircular. The granary measures 1.5 meters along the rear wall and 1.2 meters front to back. It is much ruined, consisting of sticks 1-3 centimeters in diameter set vertically 2-3 centimeters apart. Their bases are set in adobe and their tops

are washed bare and broken off. Chunks of adobe 4-6 centimeters thick were apparently plastered to the sticks for such chunks with stick marks on them are lying about. The total thickness of the wall being about 10 centimeters. The floor was covered 8-15 centimeters depth of loose adobe and sticks. Outside, within radius of 1 meter, chunks and sticks are scattered about. To the east of the granary is a room, 15 centimeters in diameter and 1.6 meters long. This may have been part of the roof. On the west side there are several sticks 7 centimeters in diameter and 1.2 meters long, also perhaps part of the roof. Next to the cliff wall from the west end of the ledge there is a flat, oval stone 2-3 centimeters thick and approximately 40 by 55 centimeters in diameter. The edges have been roughly chipped to produce the imperfect oval shape. This was presumably the cover to the opening. About 2 meters east of the granary on the cliff wall are pictographs [Scott 1931:75].

An extensive search for this site in 2006 revealed no granary [REDACTED] in the area described by the 1931 expedition. However, the description of 42Cb216 is generally consistent with that given for PR-8-3, as is the general site location [REDACTED]. Several factors militate against 42Cb216 being PR-8-3. No pictographs were observed in the vicinity of 42Cb216, and no sticks or shaped oval cap stone were observed. Upon revisiting the site in 2006, the site was found to be in the same condition as was observed in 1975 photographs. Some construction stones near the front wall have been removed sometime over the past 30 years or have eroded down slope (Figure 13).



Figure 13: View of dilapidated front wall of 42Cb216.

42Cb2581. A popular destination for river-runners, this site consists of four panels of petroglyphs,

next to the Green River floodplain. Panel 1 consists of 17 figures, of which 14 appear to be bighorn sheep. The remaining figures include one anthropomorph, one winding line and one abstract figure. All but one sheep are solidly pecked. The anthropomorph is 45 centimeters tall by 33 centimeters wide, and the sheep in the lower right of the panel is 25 centimeters long by 22 centimeters high. The word "HI" and other scratchings have been etched to the right and above the panel. Panel 2 consists of a long meandering line ending in a loop, and a small second small circular figure below. The panel is 2 meters above present ground surface (Figure 14).

Panel 3 consists of 22 to 25 pecked figures, including 16 bighorn sheep, two anthropomorphs, one elk, one possible bison and a few unidentified animals, lines and shapes. All are solidly pecked into a patinated sandstone surface. The panel is in excellent condition with one area of natural erosion that has destroyed some figures. There are at least three areas where modern inscriptions and images have been etched. These include a crude anthropomorph, an X and a large P. Panel 4 consists of at least four images, including two bighorn sheep, a circular figure with legs and an abstract or circular image. The largest sheep figure measures 23 centimeters wide by 17 centimeters tall. The circular figure with legs measures 55 centimeters high by 26 centimeters wide appears to reflect a gradient style of pecking that is commonly attributed to Ute artists in the region (Figure 14). The panel has numerous modern inscriptions, including indistinct scratches, the letters "TF," "SL is a," and "HW."



Figure 14: Panel 2 (left) and Panel 4 (right) at 42Cb2581,

Flat Canyon Sites

The Flat Canyon reconnaissance was also intuitive, but with a greater effort

expended by three separate crews to systematically examine the entire area around the confluence. Initial efforts were focused on the identification of four previously recorded sites [REDACTED] oriented toward the Green River floodplain. [REDACTED]

[REDACTED] Crew members walked pedestrian transects along the bottom of the canyon, spaced no more than 15 meters apart, and additional crew members examined the ledges on the north side of the canyon to about 50 meters above the floodplain. The south canyon wall is not geologically conducive to cultural sites and was only cursorily examined. Two previously recorded sites were re-documented, and four new sites were recorded.

42Cb79. This rock art [REDACTED]. This site consists of an elaborate petroglyph panel with 150 to 200 images that, in aggregate, measures about 15 meters north-south by 4 meters high. Many of the figures are interacting and some are superimposed over others. The figures exhibit varying degrees of patination, suggesting use of the site by individuals throughout prehistory. The figures are pecked into a slightly sloping patinated surface that is protected by a large overhang. The figures include anthropomorphs with gender-specific detail, halos, spiked spirals, a female figure with breasts in bas relief, horned snakes and a small number of quadrupeds, probably bighorn sheep (Figure 15). Many of the figures are executed in a Fremont style with trapezoidal anthropomorphs. Others exhibit influences of Glen Canyon Style 5 and Barrier Canyon styles, both attributed to Archaic occupations on the northern Colorado Plateau. Some figures are pecked in outline and others are pecked solidly. Suspected prehistoric images on the north edge of the panel appear to have been intentionally scraped from the cliff face, perhaps prehistorically or by historic indigenous groups. This site is among the most popular destinations for river-runners.



Figure 15A: [REDACTED] Petroglyph Panel (42Cb79), panel left.



Figure 15B: 42Cb79 (left center).



Figure 15C: 42Cb79 (center).



Figure 15D: 42Cb79 (center right)



Figure 15E: 42Cb79 (right)

42Cb83. This storage site

[REDACTED] This site was initially described by Richard Fike in 1973 as "One exceptionally well preserved granary approx. 4 feet in diameter, 4 feet high constructed of wood poles ... With slab and mud placed over poles. Round wood opening on slanted top. Another granary in poorer condition and not as well constructed (is located) north approx. 6 feet. Slab and mud block construction." As observed in 2006, this site consists of two large storage structures, both constructed of unmodified stone slabs and mud. Feature 1, the southern granary, is very well preserved, although it appears that all interior contents have been removed. This structure features numerous intact wooden beams with willow cordage binding the superstructure in place (Figure 16). The surface opening has a rounded willow-like lining and willow or other twigs have been used to bind the structure in several places. A sample of the willow binding was collected for radiocarbon analysis. Feature 2, the northern granary, is located about 1.5 meters to the north and consists of two upright slabs and copious adobe in the interstices, although the front wall has collapsed (Figure 17).



Figure 16: 42Cb83, Feature 1.

42Cb220. This rock art locale

It was

initially recorded in 1975 by Bruce Louthan, who described it as "2 m. off ground in shallow overhang on bottom of terrace floor above river. Just behind box elder tree. Petroglyph includes biped w/headdress, to his right have dots in square, circles, possible sheep and others undecipherable. On vertical wall, brown patination. Pecking irregular, uneven spacing and size. No sketch made."

The site appears to be in the same condition as observed in 1975, consisting of a single panel of petroglyph images and without associated cultural materials. Among the figures are a bipedal figure with a lateral horned headdress, a rectangle with rounded corners, a dot pattern and a three-toed image (Figure 18). The figure with a headdress is trapezoidal and features a headdress with two levels of stacked shapes above. A total of 10 to 12 images are present, but most are not decipherable. A packrat midden is located about 15 meters above the panel in a crevice.



Figure 17: 42Cb83, Feature 2.



Figure 18: Rock art panel at 42Cb220.

42Cb221. This site is [REDACTED]. It was originally recorded in 1975 as a single-figure rock art panel 6 inches wide by 4 inches high, but no additional description was offered other than a feature sketch. Upon revisiting the site in

2006, the rock art panel was found to be in the same condition as reported in 1975. Additionally, a nearby rockshelter (Feature A) was found to have corncobs and burned bone, but no structural features. Feature A consists of a small sheltered cavity located in the first cliff level about 1 meter above present ground surface (Figure 19). The opening measures 2.1 meters across the front and is oval-shaped with a smaller, narrower cavity at the back. The main cavity is about 2 meters front to back and has a maximum height of 2 meters. The floor is sloping and is covered with packrat midden that included a corncob. A second corncob was observed on the ground below the cavity. Both the cavity and the ground below have abundant burned bone fragments (+30), probably from deer or bighorn sheep. The fragments appear to be primarily long bones, some of which were split lengthwise. No attempt was made to access the smaller cavity at the back of the larger cavity, but it appears to measure about 25 centimeters high by 30 centimeters wide by 2 to 3 meters deep. There is possible smoke staining on the ceiling of the smaller cavity, although this could be mineral staining. The presence of burned animal bones suggests this feature was used for big game processing. The presence of unburned corncobs suggests a storage facility is located nearby, but no granary was identified.

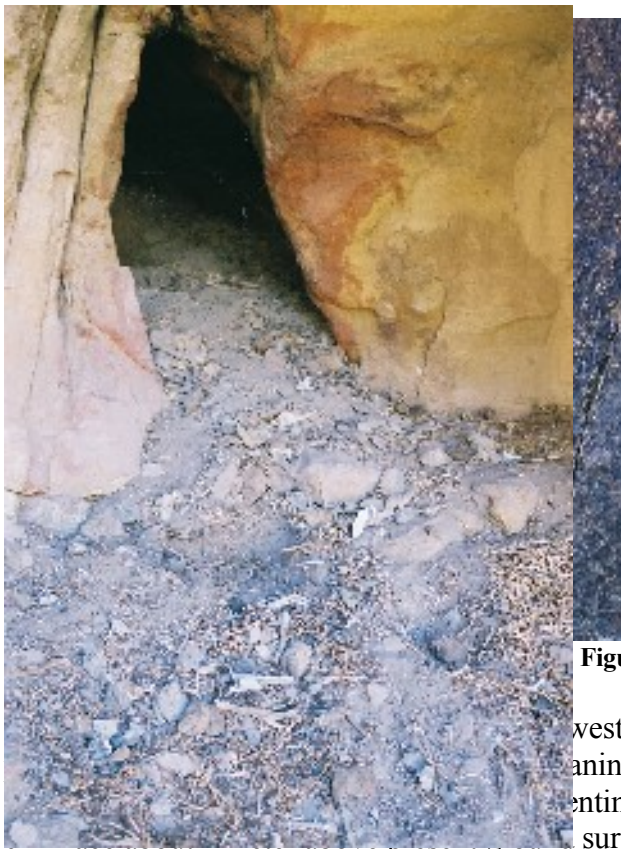


Figure 20: Feature B, 42Cb221

west of Feature A and consists of a single canine or other quadruped (Figure 20). The centimeters high and is located on a patinated surface. There is other light pecking to the left of the figure, but no image was indecipherable.

42Cb222. This storage locale

The site consists of two different storage units. Feature A is located in a small shelter facing 160 degrees and is badly eroded from water runoff through the shelter. The structure appears to have collapsed a long time ago. Still intact are two

lateral upright stone slabs that comprised the east and west walls (Figure 21). A roof slab is now resting on the west wall. The west wall slab measures 50 by 26 centimeters by 8 centimeters thick, and the east wall slab measures 27 by 37 centimeters by 6 centimeters thick. The roof slab measures 60 by 21 centimeters by 5 centimeters. The front (south) wall slab appears to have collapsed down slope. This slab measured 75 by 45 by 7.5 centimeters and was located 60 centimeters directly below the structure. The remainder of the structural debris is lying between the east and west walls. No wood or adobe elements were observed. The structure is about 0.5 meters wide by 1.7 meters deep.



Figure 21: 42Cb222, Feature A, remnants of slab cist or granary.

Feature B is a second granary in a different protected shelter to the east (Figure 22). It features upright slab construction with red mud mortar, some exhibiting fingerprints. At least 10 construction timbers were observed with a maximum length of 2 meters. The mortar has pebbles mixed into the matrix. The structure has collapsed, although most of the building detritus has been re-stacked inside the chamber. The structure measures 1.7 meters east-west by 90 centimeters north-south and has a maximum height of 57 centimeters. There is an estimated 20 centimeters of fill inside the structure. At least one timber exhibits ax marks, although most appear to have been broken to their desired length. One juniper log has evidence of burning along its length.



Figure 22: Feature B at 42Cb222. Note the construction beams.

42Cb441. This small rockshelter is located [REDACTED]

[REDACTED] The shelter measures about 2 meters by 5 meters. The outside edge is demarcated by a loosely laid drylaid wall of sandstone slabs and blocks that may have originally stood two to four courses high. A concentrated area with juniper bark about 60 by 40 centimeters was observed in the southern corner of the shelter, suggesting a bark-lined cist or juniper matting. The interior was trowel tested in 1984 by Marilyn Swift and Tim Kearns.

The site was revisited in 2006 and was found to be substantially in the same condition as in 1984. The site was described by Swift and Kearns as "a small rock shelter located near the large petroglyph panel site (42Cb79). The shelter interior measures 2 by 5 meters. A somewhat sand interior is blocked off by a low lying wall of sandstone blocks. No mortar is apparent and the stones are not stacked. A concentrated matt of juniper bar (60 by 40 centimeters) in southern corner of the shelter suggests a previous bark-lined cist. The interior fill was trowel tested to a depth of 10 centimeters. At this point the bottom was not reached. Small charcoal flecks are evident in the fill."



Figure 23: View of 42Cb441 (pin flag points north). Note organics in upper center frame.

42Cb2582. This granary site [REDACTED]. The site consists of a single storage structure that is large and rather well hidden from easy view (Figure 24). It is mostly constructed of stone slabs and mud with some timbers still visible on the interior. The interior has disturbed deposits, although this is probably natural. The stone lid is still in place. The interior wood appears to be pinyon pine, and there is a lot of juniper bark in the sheltered area, but no evidence of juniper bark lining on the interior. A small fragment of twine was observed near the top slabs.



42Cb2582.

42Cb2583. This rock art locale is [REDACTED]

[REDACTED]. This site consists of a single petroglyph figure pecked into a nearly vertical sandstone cliff face that is darkly patinated and stained with mineral deposits of a deep gray or black stain cascading from above that are broken by mottled gold, white and gray lichen. The figure appears to represent a quadruped, perhaps a female bighorn sheep facing north (Figure 25).

Figure 24: Camouflaged granary or cist at

42Cb2584. This storage locale is located [REDACTED]

The site consists of a single slab-lined granary without a roof superstructure that was empty on the interior. The structure consists of three primary upright stone slabs with the back wall of the alcove comprising the back wall of the storage structure (Figure 26). A small amount of mud was observed along the back walls where the upright stones meet. The structure measures 1.1 meters by 60 centimeters and has a height of 38 centimeters. Several stones lying about could be part of the roof superstructure.



Figure 25: Petroglyph at 42Cb2583.



Figure 26: Granary remnants at 42Cb2584.

42Cb2585. This rock art site [REDACTED] It consists of a single petroglyph panel with five images executed with two different aspects. The panel is only 1 to 2 meters above the top of the slight slope and is easily visible from the canyon bottom. The figures are pecked into a heavily patinated sandstone cliff face. The figures include a spiral with a snake head at the top, a bighorn sheep with eyes depicted, an

anthropomorph with testes visible, a sun-like image and an additional wavy line or snake with undulating body (Figure 27). Based on repatination, the sun figure and undulating wavy line appear to have been executed more recently.



Figure 27: Petroglyphs with two different aspects at 42Cb2585.



Figure 28: Petroglyphs at 42Cb2586.

42Cb2586. This rock art site is located [REDACTED]

The site consists of a single petroglyph panel with two prominent anthropomorphic figures with elaborate interior designs (Figure 28). One figure on the left has antlers and a trapezoidal body with interior grid lines and distinctive male reproductive organs. The figure is holding a long staff with a bulbous end at the top. The figure has two rows of dots in an arc over the head with seven dots in each. The midsection line in the torso is wavy. The figure on the right is about half the size and has a square body with two necklace bands. There are fringe lines below the torso.

42Cb2587. This storage locale [REDACTED]

██████████ The site consists of a collapsed granary with an intact western wall (Figure 29). The front wall incorporates two large boulders that fell naturally before construction. The east wall has completely collapsed and is now only rubble. The cliff face served as the back wall of the structure and mud has been pushed into the cracks to seal the chamber. The construction appears to have been primarily stone and mud/adobe. Only small pieces of wood are lying about; no major sticks or timbers were observed.



Figure 29: Collapsed granary at 42Cb2587.

42Cb2588. This ██████████

██████████

The site consists of the remains of at least two collapsed granaries, both in poor condition due to a large slab that has fallen and crushed the structures below (Figure 30). This overburden makes it difficult to determine how many structures were originally within the shelter. On the west end there is a short section of a mud and stone wall remaining, and on the east end there is a large upright slab. These seem to demarcate the outer edges of the structures. However, there are 3.3 meters between these walls, and the remaining materials are a jumble of rubble, mud and a few sticks with no discernible walls or compartments. One corncob was collected from the east edge of the structure near the vertical slab.



Figure 30: View of collapsed granary at 42Cb2588

42Cb2589. This cache site is located [REDACTED]. The site consists of a small rockshelter with the remains of a flat, woven basket and associated vegetal remains that have been mostly covered by a large rock fall from the shelter ceiling. The basket was not visible from the large shelter opening to the north, but a small portion of it was visible through a small portal-like opening in the cliff face on the east (Figure 31). A large amount of juniper bark was also observed. The basket (parching tray) was recovered on September 20, 2006 (discussed later in this report).



Figure 31: View of basket cache (42Cb2589) location prior to removal.

42Cb2590. This site is located [REDACTED]

[REDACTED] This site consists of a single slab-lined cist or granary (Figure 32) [REDACTED]

[REDACTED] floodplain at its confluence with Flat Canyon. The cist consists of four upright sandstone slabs enclosing an area 93 centimeters



Figure 32: Granary or cist remnants at 42Cb2590

east-west by 90 centimeters north-south (outside dimensions). The upright slabs extend 25

to 45 centimeters above the outside edge and up to 25 centimeters above the inside edge. A very well developed packrat nest fills the back and upper reaches of the small shelter. No mortar or structural materials were observed.

[REDACTED]

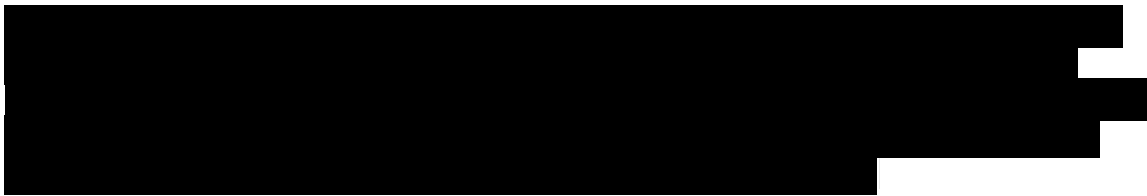
[REDACTED] the horseback contingent investigated areas near the confluence, where one previously recorded rock art site and remnants of a masonry granary were observed. An intuitive reconnaissance of the interior drainage revealed no additional sites, and given the narrow, steep-walled nature of this canyon, the likelihood of significant cultural remains was deemed to be extremely low. The absence of evidence of significant architectural remains in [REDACTED] is in conflict with observations by local ranchers, who indicated the presence of structural remains throughout the canyon. Two previously recorded sites in this area, an ephemeral petroglyph panel (42Cb227) and a sand dune encampment (42Cb226) were not relocated due to time constraints.

42Cb225. This site [REDACTED] The site was initially described by Paul Boos and Joe Winter in 1975 as two petroglyph panels, each about 2 by 3 feet in size. The panels depict a spiral sunburst-like figure, a bighorn sheep and a classic Fremont anthropomorph, among other figures. In 1975, lithic debitage was observed about 15 meters down slope from the site. The site was re-documented, photographed and sketched in 2006.

42Cb2610. This site is [REDACTED]. The site consists of the remnants of a C-shaped granary constructed under an overhang. Only the bottom two courses of the granary remain intact. The masonry construction consists of medium-sized, unmodified sandstone blocks and slabs with small tabular fill and red adobe. At the northern edge of the feature are nine courses of loosely stacked stone slabs that form a retaining wall 1.1 meters long by 0.8 meters high. The entire features measures 3.8 meters long and 1.4 meters deep. No artifacts or cultural fill were observed.

Rock Creek Canyon Sites

From the upper plateau, the horseback contingent descended the Van Deusen Trail into [REDACTED] Rock Creek Canyon. Due to time constraints, cultural resources were only cursorily inspected in this canyon. A historic homestead was documented at the top of the Van Deusen Trail prior to the descent. Inside Rock Creek Canyon, one previously recorded rock art site was revisited, and one site with prehistoric residential features was identified (this site constitutes the only evidence of residential features identified during the 2006 surveys). Additionally, two sites that appear to be water control features were identified. No convincing evidence of prehistoric water control features has yet been documented on the West Tavaputs Plateau, although there are references to prehistoric irrigation ditches in early archaeological accounts in Nine Mile Canyon. [REDACTED]



42Cb2609. This site is the historic Downard homestead located near [REDACTED]. It consists of a partially standing log cabin, a wooden livestock feed trough and two steel livestock water troughs. A perennial spring located 50 meters to the north flows into an earthen stock pond 25 meters in diameter. The single-room log cabin is constructed of Douglas fir and measures 5.3 meters long by 4 meters wide. The corners of the cabin exhibit true corner-notching with vertical saw-cut trims (Figure 33). There is a single square window 90 centimeters square located on the east and west sides of the cabin, and a 70-centimeter-wide doorway faces to the north. The feed trough consists of a large, 5 meter long Douglas fir tree trunk that has been hollowed out to a depth of 30 centimeters. The two livestock water troughs are from a Navy surplus steel tank that has been cut in half lengthwise with a cutting torch. With the exception of a few glass bottle fragments, no historic trash was observed.



Figure 33: View of Van Deusen homestead (42Cb2610) above Rock Creek.

42Cb557. This site, formally documented in 1987 by BLM archaeologist Blaine Miller, is located [REDACTED]

[REDACTED] It is situated within a small sheltered area on the south side of the canyon. The site consists of a spectacular Fremont pictograph panel depicting four large shield motifs (Figure 34). One is a solid white circle, and another is a solid yellow/orange circle in the center with a red circle around that and a white circle on the outside. The third figure is a large solid white circle with a large red circle on the outside. Inside this circle are three smaller circles in a vertical row and “rays” extending from a smaller circle. The fourth figure consists of remnants of two concentric white circles enclosing two red circles with pink interiors. A pile of stones on the floor of the shelter may be

evidence of structural remains. No artifacts were observed.



Figure 34: View of painted Fremont figures at 42Cb557.

42Cb2606. This site is located [REDACTED]. A well-developed alluvial/colluvial fan originating from this side canyon extends a good distance both upstream and downstream from the site. The site is comprised of three pit houses that occur in a small cluster and are separated from each other by less than 4 meters. The structures are square in shape and are 2.5 meters, 3.5 meters and 4 meters square, respectively. These were all constructed of colluvial sandstone boulders (Figure 35) ranging in size from 50 by 50 centimeters to 1 by 1.5 meters. The structure walls are no more than two to three courses high. No artifacts were observed, although visibility was poor at the time the site was visited. It is possible that additional pit structures are located in this area.



Figure 35: Remnants of pithouse features at 42Cb2606.

42Cb2607. This site is [REDACTED] consists of a 20 meter-long arched linear stone alignment that borders the top contour [REDACTED]. The alignment is constructed of colluvial boulders that average 40 to 60 centimeters in size, and in several places the linear alignment is several courses high (Figure 36). The age and function of this feature is unknown, although it appears to represent either a prehistoric or historic erosion-control feature. Another 15 meters down slope to the east of the arched alignment is a linear swale measuring 5 meters wide and 25 meter long (Figure 37). This feature does not appear to be natural and could possibly be an irrigation canal or ditch, possibility associated with the arched alignment of stones. No artifacts were observed.



Figure 36: Possible water-control feature at 42Cb2607.



Figure 37: Linear swale associated with water-control feature at 42Cb2607.

42Cb2608. This site is located [REDACTED] and consists of two linear sandstone alignments that are thought to have functioned as water control features (Figure 38). Both alignments were constructed of several courses of colluvial boulders (average length ca. 30 centimeters) and are 3.8 meters and 1.4 meters long, respectively. The alignments were placed across the surface of a low-gradient drainage rill that flows into a saucer-shaped catchment basin. The distance between the two alignments is 7 meters with the shortest alignment occurring up-slope. The rocks forming the bottom course of the alignment are almost completely buried in sediments. No artifacts were observed.



Figure 38: Linear stone feature, possibly a water-control feature, at 42Cb2608.

Site Condition Assessments

Sites identified during the course of the 2006 intuitive surveys were examined for evidence of human impacts, including obvious evidence of vandalism, graffiti, pedestrian trails on or near the sites, refuse, restacking of construction stones, suspected surface collection of artifacts and various aspects of modern development. These assessments revealed that most damage to archaeological sites in the Desolation Canyon corridor is probably not recent, most impacts are relatively minor and most have not significantly degraded the National Register status of the sites. The good to excellent condition of most sites can likely be attributed to a conservation ethic promulgated by the Bureau of Land Management and the river-runner community as a whole. Each of the sites is discussed individually and the collective data are indicated in Tables 3 and 4.

42Cb79

This rock art site near [REDACTED] is among the most heavily visited in Desolation Canyon. Major foot trails lead from the Green River across the floodplain to

the panel, which is obscured by vegetation. Access is easy from the Green River and from a popular camp about 700 meters to the south. Despite the heavy visitation, human impacts to the site appear to be minimal. Two distinctive inscriptions, both now historic, are located on the northern periphery of the site. One is a deeply incised "EHVW 7-13-26" and the other is a lightly pecked date of "Nov. 11, 1921," also on the north side of the prehistoric panel (Figure 39). Other impacts include what appear to be red paint splatters near the center of the prehistoric panel. These may be prehistoric elements that have eroded, but the brightness of the red is atypical of prehistoric pigments. Only small spots of red paint remain in an area 30 centimeters by 30 centimeters. State archaeologist Kevin Jones indicated he did not recall the pigment being present during a visit to the site several years before. On the south periphery of the site are numerous light scratches, presumably made in modern times. Few are discernible, although one depicts the name "JAMES."



Figure 39: Historic inscriptions at 42Cb79.

The Flat Canyon camp used by river-runners is located about 700 meters to the south of the site, and camping activities there have undoubtedly precipitated extended visits to the site. There is no evidence of vandalism, although one image appears to have been intentionally scraped from the cliff face. This could have been done prehistorically as it is focused on a single image among more than 100 images present at the site. There are no remnants of chalking or latex molds, and no evidence of trash around the site. Given the proximity of the site to a frequently used camp and the number of visitors this site receives annually, it remains in remarkably good condition. The intentional scratches on the main panel suggests some visitors have engaged in thoughtless acts that have degraded the overall quality of the panel, and that proper public outreach could alleviate future damage.

This site is appropriate for public visitation given that it is well known to river visitors and marked on guide books. However, given the popularity of this site, it is recommended that the BLM offer outreach materials that should include basic discussions as to the importance of rock art sites to indigenous peoples, the fragile nature of these sites and the proper etiquette expected of visitors to such sites. Such information could be included in popular river guides or as attachments to the river permits.

42Cb83

This site [REDACTED] located above the Green River floodplain [REDACTED] and receives significant visitation from individuals also visiting 42Cb79. A well worn pedestrian path leads from the floodplain near 42Cb79 up a moderately steep slope to the granaries, which are visible from the floodplain and trails below. The site is easily accessible from the Green River and the popular camp [REDACTED]. Heavy visitation is suggested by a juniper tree that has been worn smooth where visitors have squeezed past it to gain access to the ledge with the granary. The site generally is in excellent condition with no obvious evidence of malicious vandalism. There are no modern inscriptions, graffiti or litter on or around the site. The collapsed walls of the northern granary may be attributed to vandalism in the past, but the feature is in essentially the same condition as described by Richard Fike in 1973. The absence of artifacts or cultural deposits on the interiors suggests that cultural materials may have been removed sometime in the past. A fragment of willow (Figure 40) used in the construction of the south chamber was collected for radiocarbon analysis that can assist the BLM in interpretive efforts by placing the site into temporal context.

This site remains well known to river-runners and limiting future public access to the site is probably not realistic. Given that a high level of visitation will continue, it is recommended that the BLM offer interpretive materials related to this site. This information should include basic discussions as to the importance of storage sites to archaeologists attempting to understand prehistoric lifeways, the fragile nature of prehistoric architecture and the proper etiquette expected of visitors to such sites. It is also recommended that this site should be regularly monitored for deterioration and structural degradation, and that access to the ledge be limited (or prohibited) if such degradation accelerates.



**Figure 40: Small willow fragment collected from this matrix for analysis.
42Cb215**

This rock art site [REDACTED] was found to be in essentially the same condition as was observed 30 years ago, although suffering from natural erosion. The site is easily accessible from a river camp about 400 meters to the south. No vandalism was observed. The site is located only about 5 meters horizontal distance and 3 meters vertical distance from an access trail. The only evidence of modern human activity was a rusted piece of metal with an attached wire that was found about 4 meters to the north. It is possible that one or more of the images are of recent origin. The quadruped image appears older, but it also appears to have been made with a metal chisel. The circle and horseshoe figures appear recent, based on the lack of any repatination. Given the ephemeral nature of this site, it is unlikely that it will receive significant visitation from river-runners, although it could be discovered serendipitously by individuals seeking to access nearby 42Cb2581, a larger and more aesthetically attractive rock art site. It is recommended that this site be consistently monitored for future site degradation.

42Cb216

This granary located [REDACTED] about 400 meters from the nearest river camp was found to be in essentially the same condition as observed by William Lipe in 1975. Footprints of one or two people at the site indicate it has been visited recently, although there is no trail to the site. A comparison of the 1975 photographs to current site condition indicates that some slabs and mortar have been moved around. It is difficult to determine when the site alteration occurred, or whether the granary collapsed from natural erosion or malicious activities. However, it appears that the site has been altered in the past several decades, and that interior debris has been cleared out and placed in front of the structure, presumably by individuals searching for artifacts. No graffiti was observed at the site, but numerous modern inscriptions and signatures were observed in the area. These included a "DJ 88" inscription, historic scratching just to the right of that inscription, two spray-painted images of the letter "B" and historic scratching (Figure 41).



Figure 41: Graffiti and scratched images observed near 42Cb216.

This site, which may have been identified in 1931 by the Claflin Emerson Expedition, is not well known to river-runners and likely does not receive significant visitation. However, the site has suffered extensive degradation from visitors in the past and damage to its structural integrity is apparent. If it is the Claflin-Emerson site, it has suffered significant damage since 1931. It is recommended that this site not be identified by the BLM for public visitation, and that it be consistently monitored for future site degradation. Given the potential for interior cultural deposits, data recovery at this site would be appropriate.

42Cb220

This rock art site [REDACTED] and is easily accessible and partially visible from the floodplain. It is relatively protected by thick greasewood and rabbitbrush, which may deter heavy visitation. A major footpath is located about 20 meters to the east, but this appears to be a route used by campers at the Flat Canyon confluence about 500 meters to the south to access nearby 42Cb79 and 42Cb83. There appears to be little visitation to this site, and there is no evidence of human impacts. There are no modern inscriptions and no evidence of vandalism or trash. Overall, the site is in the same condition as that described by Bruce Louthan in 1975.

Popular camps [REDACTED] could precipitate longer-term visits to sites in this area that could result in future damage. It is likely that 42Cb220 will be accidentally discovered by visitors attempting to find nearby 42Cb79. There is no compelling reason why public access to this site should be denied, although it is recommended that site location not be disclosed and that it be regularly monitored for adverse impacts.

42Cb221

This rock art panel [REDACTED] was found to be in the same condition as that reported in 1975 by Shelley Smith and D. Hunsaker. However, Feature A (rockshelter) was not described at that time and it remains vulnerable to malicious activities. The 2006 monitoring found both features to be in good condition, although the rockshelter was heavily impacted by rodents, and livestock had bedded down in the sheltered area along the base of the cliff (but not recently). Both features are visible from a major pedestrian trail [REDACTED] leads to within 5 meters of the site. There are no modern inscriptions, litter or vandalism evident on the rock art panel, despite its easy accessibility. There is no evidence of digging or other disturbance of the midden materials associated with the rockshelter. Minor graffiti is located on the cliff face between Features A and B, both of which feature a backwards K that had been lightly scratched into the patina (Figure 42).

It is possible that river visitors will observe the simplistic rock art element from the trail without noticing the nearby shelter with cultural deposits. There is no evidence that longer-term [REDACTED] has had deleterious effects on the site. The

cultural deposits evident at Feature A (rockshelter) have considerable potential to reveal significant information about prehistoric subsistence in the Green River corridor. The location of Feature A should not be disclosed, and public visitation should be discouraged. Consistent monitoring of this feature for adverse impacts is encouraged. Given its easy access and proximity to a pedestrian trail that could precipitate future damage, data recovery would be appropriate. Visitation to the nearby rock art panel is likely insignificant given the ephemeral nature of the single image, which is visible from the trail without approaching the panel itself.



42Cb222

Granaries at this site, located inside Flat Canyon, are not readily accessible or visible from the Flat Canyon trail below, but the site has nonetheless received visitation in the past. The site is located about 30 meters above the trail at a distance of 100 meters from the trail via a steep and rocky slope. There are no trails leading to the site, suggesting the features are rarely encountered by river visitors. Feature A has no adverse effects from inscriptions, vandalism or littering, whereas Feature B has modern (or historic) graffiti associated with it. The date on the graffiti appears to be 1980, although the church image and a different date were observed when the site was initially recorded in 1975. It is possible the graffiti image has been modified, or that the original 1960 date has eroded to appear as if a 1980 date.

Figure 42: Backward K graffiti at 42Cb221.

Also, the "church" image observed in 1975 and verified in 2006 is identical to an image etched onto a historic building at the Rock Creek Ranch and may have historical significance to ranch operations in that locality. Another inscription reads "DEER" (Figure 43). These images are likely the result of historic ranching operations in the vicinity, and there is no evidence the site has suffered adverse effects from river visitation. The site is located [REDACTED] camp used by river visitors, and it is unlikely the site receives major visitation due to its remote access.

This site has considerable potential to yield additional insights into prehistoric subsistence and storage strategies, and public visitation to the site should not be encouraged and site location should not be disclosed. It is also recommended that this site be

consistently monitored for future adverse impacts that could impact the integrity of subsurface deposits and remaining architecture. Data recovery at previously damaged Feature B would be appropriate.

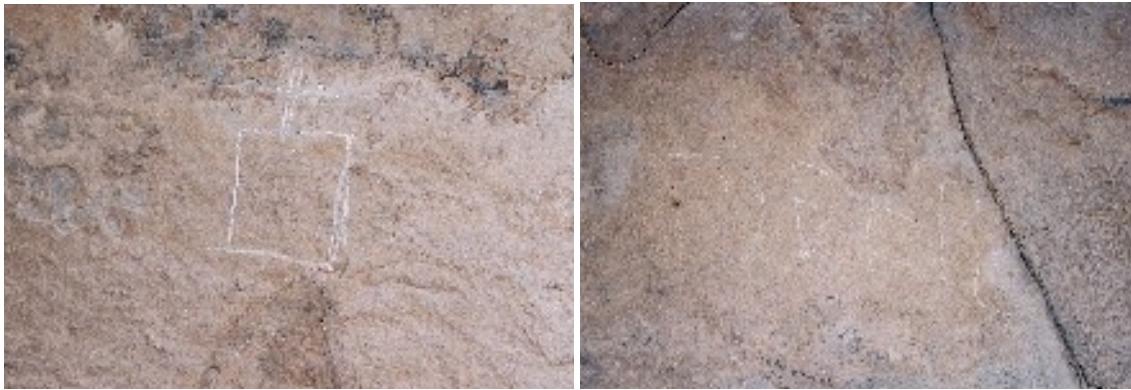


Figure 43: Graffiti or historic ranch images at 42Cb222.

42Cb225

This site [REDACTED] located about 200 meters northwest of the Green River and about 15 meters above the floodplain at the base of the first cliff level. It is easily accessible from the river, although not visible from the river. No adverse impacts were noted in 1975, and the site appears to be in essentially the same condition in 2006. The confluence area [REDACTED] is a popular camping destination among river visitors, and it is likely the site receives considerable visitation. There is no evidence of graffiti, vandalism, litter or other adverse impacts from river visitors. There is no compelling reason why public access to this site should be denied, although it is recommended that 42Cb225 be regularly monitored for adverse human impacts.

42Cb441

This rockshelter site near the confluence of Flat Canyon is located [REDACTED]. The site was found to be in essentially the same condition as was observed in 1984 when initially documented. It is likely the site receives some visitation given its proximity to heavily visited 42Cb79. [REDACTED]. No footprints were observed, and there is no evidence of graffiti, vandalism, litter or other adverse impacts from river visitors. However, a wooden pole fragment, charred at one end, was found resting on the stone wall demarcating the outer edge of the shelter (Figure 44). This wood fragment was not depicted in the 1984 photograph of the site, and it is assumed to have been placed there after that time. A corn cob (not described in 1984) and a fragment of juniper were collected in 2006 for chronometric analysis. The site is in excellent condition.

[REDACTED] it is likely this site receives more visitation than is

evident on the site surface. There is high potential for subsurface deposits that could contribute important information about prehistoric adaptations in the region. Consequently, the location of this site should not be revealed to the general public, and visitation should be discouraged. Consistent monitoring of this site for adverse impacts to subsurface deposits is strongly encouraged. Additional data recovery would also be appropriate.

42Cb557



Figure 44: Wooden beam (center frame) on stone wall not evident in earlier photos at 42Cb441.

This site

It is likely well beyond the range of significant pedestrian visitation. The site was found to be in essentially the same condition in 2006 as was observed in 1987 when the site was formally documented. No adverse human impacts were observed,

By 2006, evidence of this trail had been obscured by heavy vegetation. No footprints were observed, and there is no evidence of graffiti, vandalism, litter or other adverse impacts from river visitors. Given the site is located near an equestrian trail used by modern ranchers to access private properties at the mouth of the canyon, the site likely receives casual or inadvertent visitation by ranch hands.

This site is a remarkable example of polychrome pictographs, and could become the target of significant visitation if it becomes widely known. However, due to the significant distance from the confluence, the thick vegetation that has obscured the trail, and the prohibition on camping at the confluence, it seems unlikely this site could be significantly impacted by high levels of public visitation in the future. Access to this site from the river currently involves crossing private lands. To facilitate amenable relations with the land owners, public visitation to this site should not be encouraged and the site location not be disclosed.

42Cb2581

This rock art site is frequently visited by river-runners, as evidenced by a major pedestrian trail leading to the site from the Green River. A major river camp is located about 350 meters to the southeast. Access to the panels from the river is easy via a well-worn trail, but access from the river camp is choked with thick vegetation. The site is readily visible from the trail, which leads to within 2 meters of the

site. The overall site condition is excellent, despite its easy access and the major trail leading to the site. However, modern inscriptions and modern art images have been added to various panels, although the overall impact to the integrity of the site is minor. No dates are indicated to determine when the graffiti was added. There is no evidence of litter, malicious vandalism or other adverse impacts.

This site is appropriate for public visitation. However, given the popularity of this site and the tremendous number of visitors to the panel each year, it is recommended that the BLM offer public outreach materials related to this site. This information should include basic discussions as to the importance of rock art sites to indigenous peoples, the fragile nature of these sites and the proper etiquette expected of visitors to such sites. Such information could be included in popular river guides or as attachments to the river permits.

42Cb2582

This site consists of a well hidden and camouflaged granary tucked into an alcove a considerable distance above the valley floor and not visible from or associated with any existing trails. It is located [REDACTED]. A considerable effort was required to find the site and access it from the valley floor. However, footprints were observed around the site, indicating somebody, probably river visitors, have located the site. The site is in excellent condition and there is no evidence of litter, pedestrian trails, graffiti, vandalism or other adverse impacts. Given the camouflaged nature of the storage structure, only the most determined individual is likely to visit this site. Given the likelihood of intact deposits, public visitation to this site should be discouraged and its location not disclosed. It is also recommended that this site be consistently monitored for future adverse impacts, including pedestrian traffic, illegal digging into cultural deposits and structural integrity.

42Cb2583

This site abuts [REDACTED] and is located adjacent to a major trail [REDACTED] consists of a single quadruped petroglyph clearly visible from the pedestrian trail [REDACTED]. Despite its proximity to the trail and its visibility, there is no evidence of adverse human impacts. No litter or graffiti were observed, and there is no evidence of vandalism on or around the site.

This site is suffering from significant natural erosion, although it remains in good condition. Given its visibility from the pedestrian trail, public visitation is likely inevitable. Therefore, it is recommended that the BLM offer interpretive materials related to this site. This information should include basic discussions as to the importance of rock art sites to indigenous peoples, the fragile nature of these sites and the proper etiquette expected of visitors to such sites. Given the severe erosion, visitors should be cautioned against touching or tracing the figure. Such information could be included in popular river guides or as attachments to the river permits. Consistent monitoring is recommended.

42Cb2584

The site, [REDACTED], consists of a dilapidated granary constructed of upright stone slabs but missing its roof superstructure. The structure, located on the second cliff level above the Green River floodplain, is devoid of cultural deposits. Access up the steep slope is moderate. The condition of the storage structure may be due to natural erosion, although its proximity to [REDACTED] suggests the possibility that interior deposits may have been removed by visitors who also compromised the structural integrity sometime in the past. Access is steep, and there are no pedestrian foot trails to the site, no litter and no obvious evidence of recent vandalism. An interior devoid of deposits is suspicious, but that alone is not conclusive evidence that the site has been impacted in modern times.

The absence of interior deposits and organic materials diminish the potential of this site to contribute important information about prehistoric subsistence. However, the site retains potential, when placed in context with other nearby storage facilities, to contribute to an understanding of land-use patterns in the Flat Canyon area. Given the dilapidated condition, public visitation to this site should be discouraged to minimize future damage. Consistent monitoring of the site for future adverse impacts is also recommended.

42Cb2585

This rock art site is located [REDACTED]
[REDACTED]. The site is very noticeable from the trail and access up the slight slope is very easy. Despite the accessibility of the panel, there is no evidence of litter, graffiti, malicious vandalism or other adverse impacts.

This site already receives considerable visitation, and it is probably appropriate for continued visitation, although regular monitoring is warranted. It is recommended that the BLM offer interpretive materials related to this site. This information should include basic discussions as to the importance of rock art sites to indigenous peoples, the fragile nature of these sites and the proper etiquette expected of visitors to such sites. Such information could be included in popular river guides or as attachments to the river permits.

42Cb2586

The site consists of two largely repatinated anthropomorphic images on a cliff face [REDACTED]
Neither figure is readily visible from the valley floor, although they are executed on a prominent patinated cliff face that is visible from the floodplain. An ephemeral trail zigzags up the steep slope, suggesting the site may receive limited visitation. It is also possible this is a game trail that is seldom used. In either case, it is likely the site is seldom visited by river visitors. The site exhibits no evidence of graffiti or malicious vandalism, and the only evidence of modern human activities was a rusted knife blade found about 30 meters to the east on the same bench level.

The anthropomorphs at this site are remarkably detailed, and given the level of repatination may be older than the ubiquitous Fremont sites in the area. Visitation to this site appears to be infrequent, which has likely contributed to site preservation. Given that the panel is located on an eroding cliff face, any amount of touching, chalking or other similar activity could impact the integrity of the images. It is therefore recommended that this site not be identified for public visitation. It is also recommended that this site be consistently monitored for future adverse impacts.

42Cb2587

Site consists of a partially collapsed granary at the base of the second cliff level on [REDACTED]. Access is steep and the site is not visible from the pedestrian trail on the floodplain below. There are no trails leading to the site, and no litter, graffiti or evidence of malicious vandalism was observed. It is possible the east wall was knocked over intentionally, but it is also possible the collapse was due to natural erosion. The site appears to be in good condition with considerable potential for subsurface cultural deposits.

This site is likely beyond the zone of significant public visitation and it probably remains at minimal risk from human impacts resulting from casual river visitation. However, its isolation could make it an attractive target for malicious activities, including vandalism. The location of this site should not be disclosed and public visitation to this site should be discouraged. Consistent monitoring of site integrity is warranted.

42Cb2588

This storage site is located [REDACTED] is likely beyond the periphery of most casual visitors to Flat Canyon and likely does not receive significant visitation. There are no pedestrian trails to the site, no litter, no graffiti and no evidence of malicious vandalism. The site is in poor condition because of the natural collapse of the shelter wall/ceiling that has crushed the features below. The site remains relatively accessible, being only 8 meters above the floodplain and about 50 meters from an ephemeral pedestrian trail [REDACTED]. One corn cob was collected by archaeology crews in 2006 for radiocarbon analysis.

There is considerable potential for intact subsurface deposits and surface artifacts that could contribute important insights into prehistoric lifeways. There also is a potential this site could be subjected to surface collecting and other improper activities, including intentional vandalism, because of its remote location. The location of this site should not be disclosed, and public visitation should be discouraged. Consistent monitoring of this site for future adverse impacts is also recommended.

42Cb2589

[REDACTED]

[REDACTED] A portion of the basket was clearly visible to anyone walking along the base of the cliff and it is remarkable that it had not been illegally removed prior to recovery. There was no evidence the area had been visited recently. There is no litter, graffiti, vandalism or other adverse impacts evident on or around the site. Given the potential that the artifact could be illegally removed, the basket was recovered and is currently being analyzed at the Utah Museum of Natural History.

Given the potential for additional buried materials at this site, public visitation to this site should be strongly discouraged, and the site location not revealed. It remains possible that organic materials not collected will be observed by river visitors, prompting illegal digging into the deposits. To minimize that possibility, remaining cultural materials were covered by large stone slabs. However, regularly monitoring of this site to deter future digging and collecting is strongly recommended.

42Cb2590

This storage cist [REDACTED] It is highly probable that visitors remaining at the camp have climbed the steep slope to the larger shelter, which is floorless and has no cultural features, and subsequently discovered the small granary in the adjacent shelter. There is very little evidence the site itself has received significant visitation. The site is located about 30 meters vertical distance above the floodplain and about 100 meters from the nearest pedestrian trail. The 14-degree slope may inhibit some visitation. The structure appears to have intact interior deposits, and there is no evidence of digging or other vandalism at the site. There is also no evidence of graffiti, litter, footprints or other adverse impacts.

Because of its proximity [REDACTED], it is likely the site has received some visitation over the years, and the excellent preservation of interior deposits is remarkable. Given the potential for subsurface deposits that could contribute important insights into prehistoric lifeways, public visitation to this site should be discouraged. Consistent monitoring of the site is also recommended, and data recovery may be warranted given the potential for future vandalism by individuals [REDACTED]

42Cb2606

This site consists of a cluster of pithouses [REDACTED] There are currently no pedestrian trails to the site, no vandalism or graffiti, and no evidence of any adverse human impacts. Given the site is located near an equestrian trail used by ranchers to access private properties at the mouth of the canyon, the site probably receives some casual or inadvertent visitation by ranch hands. No surface artifacts were noted that would draw visitors' attention to the site.

Given the distance [REDACTED], the overgrowth of vegetation

obscuring the trail and the current prohibition on camping on private lands at the mouth of the canyon, this site would appear to be at low risk of future adverse human impacts. However, the remote nature of the site and absence of a human presence here could facilitate future vandalism by individuals determined to excavate undisturbed deposits. Access to this site involves crossing private lands. To foster good relations with the landowners, hiking [REDACTED] should not be encouraged, and the location of this site and others in the area should not be disclosed. Periodic monitoring of this site is warranted.

42Cb2607

This site [REDACTED]
[REDACTED] is likely beyond the range of pedestrian visitation. The linear sandstone alignments thought to have functioned as water control features are likely not recognizable as cultural features to most river visitors, and as such the site is not likely to suffer from significant adverse human impacts. The pedestrian trails to the site are overgrown with vegetation. There is no evidence of vandalism or graffiti. Given the site is located near an equestrian trail used by modern ranchers to access private properties at the mouth of the canyon, the site probably receives casual or inadvertent visitation by ranch hands.

Due to the significant distance from river camps near the confluence, the thick vegetation that has obscured the trail in the upper portion of the canyon and the prohibition on camping at the confluence, the possibility this site could be significantly impacted by public visitation is considered to be low. Access to this site from the river currently involves crossing private lands. Consequently, visitation to this site should be discouraged and the site location should not be disclosed. This site should be periodically monitored to assess future impacts.

42Cb2608

This site is [REDACTED]
[REDACTED] is likely beyond the range of pedestrian visitation. The two linear sandstone alignments that are thought to have functioned as water control features are likely not recognizable as cultural features to most river visitors. The pedestrian trails to the site are currently overgrown with vegetation. There is no vandalism, graffiti or other adverse human impacts. Given the site is located near an equestrian trail used by modern ranchers to access private properties at the mouth of the canyon, the site likely receives casual or inadvertent visitation by ranch hands.

Due to the significant distance from river camps near the confluence, the thick vegetation that has obscured the trail and the prohibition on camping at the confluence, this site will likely not be significantly impacted by public visitation. Access to this site from the river currently involves crossing private lands. Consequently, visitation to this site

should be discouraged and the site location not be disclosed. This site should be periodically monitored to assess future impacts.

42Cb2610

This storage site is [REDACTED] [REDACTED] At the time of the 2006 reconnaissance, river visitors were camped here and informed archaeological crews about the granary. Consequently, it is likely the site receives some visitation despite its deteriorated condition. A wall of drylaid stone slabs nine courses high may have been restacked in modern times. The collapsed condition of the structure walls and the absence of interior deposits suggest this site has been vandalized at some point in the past and that cultural materials have been removed.

The absence of interior deposits and organic materials diminish the potential of this site to contribute important information about prehistoric subsistence. However, the site retains potential, when placed in context with other nearby storage facilities, to contribute to an understanding of land-use patterns in the Desolation Canyon area. Given the dilapidated condition, public visitation to this site should probably be discouraged. However, given the popularity of the [REDACTED] camp for river visitors, continued visitation to this site is considered inevitable. Given that deterring site visitation is improbable and the feature is already in a deteriorated condition, the BLM may want to consider using this site for public outreach and education. At a minimum, consistent monitoring of the site for future adverse impacts is recommended. Data recovery would also be appropriate.

Discussion: Site Condition

The 2006 intuitive surveys were conducted within the construct of two working hypotheses related to site condition and susceptibility to adverse human impacts. It was assumed that archaeological sites in the Desolation Canyon will have suffered minimal vandalism due to their isolation and limited access. Vandalism will be the greatest along the Green River corridor, accessible by recreational watercraft, and near the heads of the side drainages, accessible by road. Vandalism will diminish in direct proportion to distance from access points such as existing roads, ATV trails and hiking trails. Not all aspects of this hypothesis could be tested. [REDACTED]

[REDACTED] Plans to examine Jack Canyon, which does have evidence of vehicular traffic, were abandoned due to time constraints.

Consequently, the intuitive surveys were refocused on areas primarily accessible by watercraft and to historic ranching operations, but without road or ATV access. All of the sites investigated were located within 100 meters of an existing pedestrian or equestrian trail, and in most cases a trail led to within 50 meters of the site. There was no direct correlation between ease of access or site visibility and the occurrence of adverse impacts from human activities. Even sites that were camouflaged or hidden from easy

view exhibited evidence of site visitation (see Table 3).

Table 3: Site location data and corresponding human impacts

Site No.	Site Visible From Trail	Location Visible	Trail to Site	Foot prints On Site	Meters To Camp	Meters To Trail	Meters Above Trail	Slope	Access	Impacts Observed
42Cb79	Yes	Yes	Major	Yes	700	15	2	3	Easy	VA, GR
42Cb83	Yes	Yes	Major	Yes	600	1	1	15	Easy	VA
42Cb215	Yes	Yes	Major	Yes	500	3	3	1	Easy	GR, LT
42Cb216	Yes	Yes	None	Yes	400	30	40	30	Easy	VA, SM
42Cb220	Yes	Yes	Major	Yes	500	20	3	2	Easy	None
42Cb221	Yes	Yes	Major	Yes	400	1	5	5	Easy	LV
42Cb222	Yes	Yes	None	No	900	65	35	12	Moderate	GR, SM
42Cb225	Yes	Yes	None	No	500	30	--	--	Easy	None
42Cb441	No	Yes	Major	No	700	10	6	30	Moderate	SM
42Cb557	Yes	Yes	Minor	No	4000	2	1	1	Moderate	None
42Cb2581	Yes	Yes	Major	Yes	350	2	2	1	Easy	GR
42Cb2582	No	No	None	Yes	800	100	50	25	Difficult	None
42Cb2583	Yes	Yes	Major	No	650	25	2	2	Easy	None
42Cb2584	No	No	None	No	550	100	35	15	Moderate	VA
42Cb2585	Yes	Yes	Major	Yes	500	25	2	2	Easy	None
42Cb2586	Yes	Yes	Minor	No	700	65	25	14	Moderate	LT
42Cb2587	Yes	Yes	None	No	1000	50	40	15	Difficult	None
42Cb2588	Yes	Yes	None	No	1450	45	6	10	Easy	None
42Cb2589	No	Yes	None	No	250	100	15	12	Easy	None
42Cb2590	No	Yes	None	No	350	100	30	14	Moderate	None
42Cb2606	No	Yes	Minor	No	4000	--	1	1	Difficult	None
42Cb2607	No	Yes	Minor	No	4000	--	1	1	Difficult	None
42Cb2608	No	Yes	Minor	No	4000	--	1	1	Difficult	None
42Cb2609	Yes	Yes	Major	No	8000	10	1	1	Difficult	LT
42Cb2610	No	Yes	Minor	Yes	250	30	30	--	Easy	VA, SM

Note: VA is vandalism, GR is graffiti, LT is littering, SM is site modifications and LV is livestock. Some location data are missing. Site 42Cb2609 is located on the West Tavaputs Plateau on a major access route from the top that is closed by locked gates. Access from the river is extremely difficult.

For the purposes of this analysis, evidence of adverse impacts caused by humans in recent times was considered within constructs of (1) malicious vandalism, which includes digging into cultural deposits, toppling of walls and intentional defacement of rock art images; (2) graffiti, which includes the addition of names, initials, dates and other images at or near archaeological sites; (3) site modifications, which includes movement or restacking of collapsed stone walls and stacking of artifacts into piles; and (4) inadvertent impacts such as pedestrian trails and litter. It is recognized that all four categories of impacts may be considered to be vandalism as the term has been traditionally applied to archaeological sites on the northern Colorado Plateau.

This organizational scheme is patterned loosely after that offered by Nickens et al. (1981), who reviewed damaging activities, or what they referred to as “agents of cultural resource destruction,” in their study of impacts to Ancestral Puebloan sites in the Southwest. Their study included a compilation of known site data through the use of certain variables thought to be important to the problem, field checks to compare file data and interviews with known collectors to get first hand accounts of the most vulnerable sites. Perhaps most important was their utilization of easily discernable, site-related variables through the use of a standardized vandalism form. These variables included the age or cultural period of a site, general site type, distance to the nearest road, type of nearest road and the distance to the nearest town. The 2006 intuitive surveys in Desolation Canyon study also incorporated a detailed vandalism form that included more

than two dozen variables, among them slope, ease of access, visibility from a road or trail, site type, and vertical and horizontal distance above an access route.

Based on the data from the 2006 surveys, graffiti and site modification appears to be the most prevalent problems at sites in the Desolation Canyon corridor. Graffiti was observed at or near six sites, and possible site modifications were noted at four sites (see Table 4). In all of these cases, the graffiti and site modifications did not significantly impact the National Register qualities of the sites. In most instances, the graffiti consisted of lightly scratched images, initials and names on stone surfaces adjacent to cultural features but not directly on the cultural features. One exception is graffiti on panels at 42Cb2581 [REDACTED], and another is lightly scratched names and indecipherable images over prehistoric images at 42Cb79 [REDACTED]. This site also has one figure that appears to have been intentionally scraped from the cliff face, although this could have been a ritualistic removal of the image by indigenous groups in the past and may not be modern vandalism (this defacement is nonetheless categorized as a malicious vandalism in the absence of convincing evidence to the contrary). There is no unequivocal evidence that any of the instances of graffiti occurred recently. All sites with graffiti feature easy or moderate access.

Instances of site modifications include restacking or shifting of wall rubble at 42Cb216, [REDACTED]; possible restacking of a wall at 42Cb2609 at [REDACTED]; and the placement of a burned wooden beam over a drylaid stone wall sometime over the past two decades. Wall features at Feature B, a granary at 42Cb222, may have been modified and construction beams moved, but this evidence is equivocal in the absence of photographic comparisons. It should be noted that all three granaries are dilapidated and may have become degraded through visitation. All sites with modern modifications feature easy access.

Five sites exhibited “possible” evidence of malicious vandalism (e.g., architectural deconstruction, excavations), although this evidence was equivocal. In two cases (42Cb83 and 42Cb2584), vandalism was suspected because the interiors of the granaries were devoid of cultural deposits that should have been present. At 42Cb216 and 42Cb2610, vandalism was suspected because of the absence of deposits, the sparse remnants of masonry walls and the apparent movement or restacking of stones. As discussed above, the intention defacement of a single image at 42Cb79 may or may not be vandalism. In four of five cases, access was steep, although not especially onerous. Two of the five sites featured major trails leading to the site.

The presence of modern refuse is also a minor problem at cultural sites, with only two sites exhibiting evidence of discarded items. In both cases the trash was not recent. A third site with historic trash is the Downard homestead, where the trash appears to be associated with modern ranching activities and not from recreational visitation to the site. There is also minimal evidence that pedestrian trails have directly impacted cultural deposits (cultural deposits of any kind were extremely rare), although there remains potential that pedestrian traffic along the Green River and Flat Canyon floodplains could expose subsurface cultural deposits. No artifacts were observed on these trails.

Table 4: Site Condition Summary

Site No.	Site Type	Site Condition	Malicious Vandalism	Graffiti Present	Site Modification	Litter or Debris
42Cb79	Rock Art	Excellent	Yes	Yes	No	No
42Cb83	Granaries	Excellent	Possible	No	No	No
42Cb215	Rock Art	Excellent	No	Possible	No	Yes
42Cb216	Granary	Good	Possible	Yes	Possible	No
42Cb220	Rock Art	Good	No	No	No	No
42Cb221	Rock Art, Midden	Excellent	No	Yes	No	No
42Cb222	Granaries	Good	No	Yes	Possible	No
42Cb225	Rock Art	Good	No	No	No	No
42Cb441	Rockshelter	Good	No	No	Yes	No
42Cb557	Rock Art	Excellent	No	No	No	No
42Cb2581	Rock Art	Excellent	No	Yes	No	No
42Cb2582	Granary	Excellent	No	No	No	No
42Cb2583	Rock Art	Excellent	No	No	No	No
42Cb2584	Granary	Fair	Possible	No	No	No
42Cb2585	Rock Art	Good	No	No	No	No
42Cb2586	Rock Art	Excellent	No	No	No	Yes
42Cb2587	Granary	Poor	No	No	No	No
42Cb2588	Granaries	Poor	No	No	No	No
42Cb2589	Cache	Excellent	No	No	No	No
42Cb2590	Granary	Good	No	No	No	No
42Cb2606	Pithouses	Good	No	No	No	No
42Cb2607	Water Control	Good	No	No	No	No
42Cb2608	Water Control	Good	No	No	No	No
42Cb2609	Homestead	Fair	No	No	No	Yes
42Cb2610	Granary	Poor	Possible	No	Possible	No

*Access designation denotes access from the river.

It was suspected that archaeological sites in side drainages subject to oil and gas development may have been more adversely impacted than drainages without oil and gas development. Specifically, road access that subsequently facilitates ATV use of the bottom of Jack Canyon would facilitate greater adverse impacts than are evident in Rock Creek, which has no road access but is heavily visited by river-runners. As mentioned above, this hypothesis could not be tested due to time constraints that precluded examination of sites in Jack Canyon. None of the areas investigated in 2006 had evidence of vehicular traffic.

Discussion: Prehistoric Lifeways

The data collected during the course of the 2006 intuitive surveys, when augmented by future research, will contribute to a better understanding of prehistoric adaptations along the Green River corridor by farmer and foragers. Previous research in the region has failed to contribute significantly to a discussion of prehistoric lifeways in the region, and this discussion, while constituting the first such effort, remains extremely speculative and should be augmented by future research in different areas of the canyon corridor and on both sides of the Green River. This discussion is predicated on five working hypotheses:

- We expect that prehistoric Formative populations in the Desolation Canyon area were seasonal maize farmers who were tethered to those areas with predictable sources of permanent water. Hence, prehistoric sites will be located in those drainages with

permanent water and sufficient arable lands to accommodate small-scale horticulture, including the Green River corridor and Rock Creek.

- We expect that prehistoric farming in the Desolation Canyon side drainages was limited by the paucity of arable lands. This would have mandated small and dispersed farmsteads situated in environmentally suitable niches, but the overall population would have been small. Population clusters will occur only in those areas with an optimal combination of permanent water and arable land.
- We expect that prehistoric occupations of the Desolation Canyon area were temporary, reflecting seasonal migration of small farming groups into the area from Range Creek or Nine Mile Canyon in the spring, and out-migration after the harvest in the fall. Sites will be largely ephemeral occupations with minimal expenditure of energy in residential architecture, and they will have a paucity of artifacts and middens.
- We expect that storage strategies will reflect seasonal abandonment of the area, e.g., the location of energy-expensive storage facilities on inaccessible cliff ledges is evidence of human predation and the absence of a local population to protect stored resources. The capacity of the storage facilities should reflect adequate caloric return to accommodate resident farming populations prior to the fall harvest.
- Large scale surveys of the Flaming Gorge and Glen Canyon corridors during the 1950s and early 1960s demonstrated that major river corridors were not the focus of major prehistoric occupations. Rather, human adaptations were focused to a greater degree on side drainages. Consequently, evidence of more semi-permanent occupations should be located around the mouths of side canyons like Flat Canyon and Rock Creek, but the canyon corridor itself would reflect ephemeral occupations, mostly campsites and special use sites

The findings of the 2006 intuitive surveys are discussed collectively within the constructs of all five working hypotheses, although not all aspects were tested. Specifically, time constraints precluded an examination of the middle portions of the side drainages, limiting a comparison of human land-use patterns to those sites around the mouth of the canyons and within 1.6 kilometers inside adjacent side drainages. Generally, prehistoric adaptations in the Green River corridor were consistent with the hypotheses offered, but with some notable exceptions discussed below.

The four areas selected for intuitive survey have different environmental characteristics that would have influenced prehistoric adaptations. From north to south, [REDACTED] is a relatively short west-to-east side drainage without permanent water and largely devoid of abundant floral resources conducive to foraging. Flat Canyon is a significant west-to-east side drainage (at least 8 kilometers long) that features a broad alluvial floodplain, steep canyon walls and an intermittent stream with adequate water to support a minor riparian zone along the bottom, but likely insufficient to accommodate horticulture except during the most favorable precipitation regimes. The canyon features an entire suite of vegetation zones, from sparse shadscale communities in the lower reaches to alpine plant communities near the headwaters.

[REDACTED], another short west-to-east side drainage without permanent

water, features a historic access route from the Green River floodplain to the upper West Tavaputs Plateau (ca. 9,000 feet elevation). The canyon rises rapidly from its confluence with the Green River, and features sparse vegetation around the mouth, but has significant pinyon and juniper stands in the middle portion, and alpine communities at its headwaters. Local informants had indicated the presence of significant archaeological resources in this canyon.

The fourth area selected for examination was Rock Creek Canyon, a significant west-to-east drainage with perennial flowing water (Rock Creek), a broad floodplain conducive to agriculture in the middle portion, a historic access route from the Green River floodplain to the upper reaches of the West Tavaputs Plateau and previously documented evidence of permanent or semi-permanent occupation by Fremont farmer-foragers in the lower and middle portions of the canyon. Numerous sites were recorded in this canyon during the course of river monitoring activities in the 1970s and 1980s, mostly rock art and storage localities.

Only a small area of the middle portion of Rock Creek Canyon was examined in 2006. [REDACTED]

[REDACTED] The potential for deep soils is further attested to by the presence of isolated patches of volunteer alfalfa and clover, which thrive in the deep, well-drained soils. From the confluence of Left Fork to just west of the Rock Creek confluence with the Green River, the creek becomes deeply entrenched with extensive deposits of colluvial boulders and cobbles. This lower stretch has been repeatedly “flushed” by flooding, most likely during the past 100 years. As a result, there is little or no alluvium in this portion of the canyon.

Given the proximity of the Green River canyon corridor to Range Creek Canyon, a northwest-to-southeast trending drainage to the southwest, and to Nine Mile Canyon, a west-to-east trending drainage to the north, it was anticipated that prehistoric adaptations in Desolation Canyon would be similar. Prehistoric utilization of both Range Creek and Nine Mile Canyon was intensive and apparently focused to a greater or lesser degree on maize farming along permanent water sources with an optimal combination of arable land and pinyon-juniper resources. Both areas feature evidence of residential structures, storage facilities reflecting a variety of strategies, a spectacular rock art tradition and special-use locales indicative of tool manufacturing and maintenance, food processing and other activities. In both areas, the distribution of sites appears to reflect strategies to protect resident populations and food resources from human predation (cf. Spangler 1993, 2002; Spangler, Barlow and Metcalfe 2004).

We did not anticipate significant evidence of permanent or semi-permanent occupation would be identified in the [REDACTED] drainage, which features no permanent water, arable land or significant pinyon-juniper resources. Indeed, a quick, non-intensive reconnaissance of the canyon to a distance of about 2 kilometers west of the confluence revealed no evidence of residential sites, either substantial or ephemeral. Rather, [REDACTED]

[REDACTED] that is well within the spatial range of individuals living along the Green River corridor. Two rock art sites were also located at the mouth of the canyon, one of them quite substantial. No artifacts of any kind were observed.

In Flat Canyon, [REDACTED]

[REDACTED]. These included seven sites with storage facilities (granaries or cists), five rock art sites, one rock art site with a nearby midden of corncobs and burned bone, a rockshelter site with an ephemeral stone wall and one cache where a basket was recovered. No evidence of permanent or semi-permanent occupations was identified in either the Flat Canyon corridor [REDACTED] in the Green River corridor. With the exception of burned bone and corncobs, residential detritus was not observed at any of the 15 sites.

The area around the mouth of Flat Canyon along the Green River floodplain would appear to be ideally suited for prehistoric agriculture. It features sparse greasewood, deep alluvial deposits of finely sorted river silt and a high water table, as evidenced by numerous seeps along the base of the first cliff level. Field preparation would have been minimal, soil qualities would have been good and crops would have had sufficient water regardless of the vagaries of local precipitation patterns. The Flat Canyon floodplain inside the mouth of the canyon, while broad enough to have facilitated prehistoric agriculture, features an irregular, eroded surface of boulders and stones that have debouched from small side canyons. In many areas, the intermittent stream has eroded a deep channel that would have made it difficult to divert water to maize fields on the floodplain, although it is unknown if the down-cutting is recent.

Two sites were identified [REDACTED], one a small storage site [REDACTED]. A cursory inspection of the canyon revealed no additional sites. Given the narrow, steep-walled nature of this canyon, the likelihood of significant cultural remains was deemed to be extremely low. However, local ranchers indicated there are structural remains throughout the canyon. Two previously recorded sites in this area, an ephemeral petroglyph panel (42Cb227) and a sand dune encampment (42Cb226) were not relocated due to time constraints.

Previous research in the Rock Creek drainage had identified 18 archaeological sites, among them eight rock art sites, five granaries, four rockshelters and one artifact scatter. The rock shelter sites contained masonry features that were described as granaries or possible habitation features. All of these sites occur either along the talus base or within the lower cliff terraces of Rock Creek. A low density of artifacts was found at the lithic/ceramic scatter and only a few artifacts were noted at one of the rockshelter sites. It was anticipated that only the Rock Creek drainage would contain significant evidence of permanent or semi-permanent occupation by prehistoric agriculturalists. The 2006 reconnaissance relocated one rock art site and identified one previously unrecorded residential cluster of three pithouses and two sites with suspected water control features.

[REDACTED]

Collectively, the data appear to indicate temporary, ephemeral occupations by prehistoric farmers who did not remain in the canyon corridor significant periods of time. The abundance of storage structures, but the absence of evidence for residential activities, could be evidence of a remote farming strategy whereby central place foragers arrived in the spring, burned off the overlying groundcover along the Green River and planted crops in optimal locations with high water tables. The fields were then abandoned until the fall when individuals returned to harvest the maize that had survived, or a very small contingent of young and old could have been left behind to tend the crops. The subsequent harvest was cached in a series of small granaries for retrieval, as needed during the winter.

This is undoubtedly a high-risk strategy that would have produced low yields due to the possibilities that fields would be erased by periodic flooding, early frosts due to cold air patterns along the Green River and persistent animal predation. It also reflects a low investment of energy in the maintenance of fields, but with some expectation of a return on that minimal investment. Given the absence of evidence that farmer-foragers remained in these localities to maintain the fields, and hence ensure greater production, the floodplain fields may have been viewed as contingency resources in the event of poor harvests elsewhere. If maize crops elsewhere (e.g., Range Creek, Nine Mile) thrived, the contingency fields might not be harvested at all. Hence, a return in the fall to harvest and cache these resources would have been predicated on the perceived need to draw upon emergency resources to ameliorate the effects of drought and predation elsewhere.

As discussed by Barlow (2006:6.13-6.14), the high energy costs of harvesting ripe maize are equivalent to or higher than some of the highest-ranked foraged resources. In areas where moisture was not a constraining factor (e.g., the high water table along the Green River), “pre-planting activities like clearing land of vegetation, and perhaps weeding later during the summer, would likely result in larger increases in maize harvests.” Although a greater investment in farming would be expected to produce greater yields, the lower yield on unattended maize crops may have been insufficient to warrant harvesting and retrieval in years when the marginal return rates of other resources elsewhere, whether wild or domesticated, were greater. In effect, farming of the Green River floodplain would have intensified whenever higher-ranked resources elsewhere diminished, and it would have diminished during those times when other resources were abundant.

It has long been argued that food storage facilitates sedentism; indicates a logistic, central-place based system of resource collection; and suggests less food-sharing and egalitarianism and greater economic disparity between individuals (Binford 1968, 1980, Testart 1982). A variety of storage strategies have been observed historically in the Great Basin and Southwest, notably with smaller dispersed caches among foragers, horticulturists and farmers who organized themselves in small, fluctuating bands or households and maintained a relatively high degree of residential mobility (e.g., Kelly 1932, 1976; Pennington 1963; Steward 1938) versus larger and more conspicuous storage

facilities among hunter-gatherers and farmers who maintained semi-permanent residences or occupied larger communities of extended family households (e.g., Castetter and Bell 1951, Gifford 1932, 1933, Spier 1933, Whiting 1938).

The pattern evident in the Green River corridor is similar to two ethnographically observed populations, the Tarahumara of northern Mexico and the Southern Paiute of southwestern Utah and northern Arizona. In the Sierra Tarahumara, subsistence maize farmers today occupy multiple residences associated with different maize fields and they dry and store crops in numerous small, detached stone storage "cribs." Isolated cribs and granaries are made of stone, stone and adobe, or wood, and are located near habitation structures, incorporated into the walls of distant rockshelters or caves, or are solitary structures near remote maize fields. In the 1700s, Tarahumara farmers also built small stone structures "high on the face of cliffs" above streams (Pennington 1963). Tarahumara farmers would often have up to six maize fields, often separated by large distances. Temporary residential structures would be constructed at each of the remote fields except for more remote, smaller fields used as contingency resources.

Evidence for minimal investment in cultivated maize, at least during the early stages of cultivation, is found among the Kaibab Paiute. The Kaibab Paiutes were almost entirely dependent upon wild floral and faunal resources, and Isabel Kelley believed horticulture was introduced in the mid-1800s from other Paiute bands, but was never widely practiced and "could not have altered very materially the subsistence of the group as a whole" (1964:36). Corn was planted in early June and it ripened in the middle of August. Before the corn had sprouted, the families typically left the plots unattended during their seasonal gathering, returning when the crop was about 8 inches tall. The plots were then tended until the harvest. Squash was planted between rows of corn at the same time, and it ripened in the fall sometime after the corn harvest. Sunflowers were planted in rows to one side of the corn. Although the Southern Paiute strategy is often cited as evidence of unattended maize fields, a closer reading of the ethnographic record suggests the Paiute recognized that maize fields must be maintained to ensure some return on the investment.

The small storage structures along the Green River corridor implies that food production, despite the minimal investment, was largely successful, and that the subsequent cost of transporting the resources was reasonable. Many organisms collect food for expected future periods of scarcity, particularly in environments where resources are available in temporally discrete patches (O'Shea 1981). In addition to setting aside surplus for winter, food-hoarders also use stores to provision themselves and dependent offspring when foraging is dangerous, or increases the risk of death or injury. The documented benefits of food caching include increased survivorship, increases in overall foraging efficiency, increased mating opportunities, and increases in the number and survivorship of offspring for successful hoarders (Vander Wall 1990).

Storage practices can generally be subsumed within two distinct strategies: (1) *larder hoarding*, or the concentration of stored resources in comparatively large chambers by a resident population that effectively monitors and protects those resources

from predation, or (2) *scatter hoarding*, or the distribution of stored resources in multiple locations by a non-resident population whereby storage facilities are concealed or placed in inaccessible locations, and the loss of some stored resources to predation was viewed as an acceptable risk in light of the preservation of the remaining resources (see Vander Wall 1990).

The evidence from the Green River corridor storage structures appears to reflect scatter hoarding, but with a notable anomaly. The abundance of smaller storage chambers along the corridor and inside the side drainages is indeed suggestive of the intentional dispersal of stored resources among many different localities, and hence a strategy to minimize the risk that predation would result in the loss of all or a significant portion of stored resources. However, there is little evidence that these scattered storage locales were intentionally concealed. All are easily accessible, and in most cases they are visible from the floodplain below. This implies that human predation may not have been a significant threat and that scatter hoarding evident here was focused on minimizing the risk of animal predation. Of the nine storage sites [REDACTED] [REDACTED] only one structure appears to have been camouflaged. Unlike the storage sites in Range Creek and Nine Mile Canyon, none of the sites identified in the Green River corridor were situated on inaccessible cliff ledges. Likewise, none of the corridor sites can be considered particularly large, nor was the amount of energy expended in their construction particularly significant.

It is probable that storage structures identified by the 2006 intuitive surveys are associated with nearby residential occupations along the Green River floodplain. Residential architecture, some quite substantial, has been observed elsewhere in Desolation Canyon (Scott 1931), and it could be present near [REDACTED] [REDACTED]. However, the dearth of artifacts identified during the course of the 2006 investigations suggests that residential occupations of the canyon corridor may have been ephemeral, perhaps seasonal occupations of shelters. It is emphasized that not a single potsherd or lithic flake was observed at sites in any of the four canyons investigated. This would appear to support the concept of seasonal farming by groups not significantly engaged in hunting activities, food processing or other activities while maintaining at their fields. It is also possible that evidence of such activities was located around temporary structures constructed on the Green River floodplain, and that episodic flooding of the canyon corridor has erased evidence of these temporary occupations. Residential detritus was observed along the Green River floodplain in the nineteenth century (Steward 1948) and during some BLM monitoring activities (Roberts n.d.). The Green River floodplain was not systematically examined during the 2006 intuitive surveys, and such evidence may indeed be present.

It is also possible that the focus of residential activities, whether permanent or semi-permanent, was located in the middle portions of side drainages with optimal combinations of permanent water, arable lands and pinyon-juniper resources. Such evidence was observed in Rock Creek Canyon by the equestrian survey team. However, the data from the Flat Canyon corridor, which has abundant storage structures, are more equivocal. The canyon bottom was investigated to a distance of about 1.6 kilometers up canyon from the mouth, but no evidence was identified of water control features or

residential occupations indicative of on-site maintenance of cultivated fields in that area. There may have been sufficient water to support limited horticulture on the broad floodplain, especially during years of high precipitation, but evidence for on-site agricultural activities is entirely lacking in the easternmost portion of the canyon. The floodplain in this area is largely unsuitable for cultivation. Although evidence of residential sites may indeed be located further up canyon to the west, current evidence suggests storage facilities located in the lower part of the canyon were likely utilized by individuals farming the Green River floodplain.

Based on the limited surveys conducted to date, only one residential cluster was identified, that being located in [REDACTED] Rock Creek Canyon, which features a floodplain conducive to agriculture, a perennial water source and abundant pinyon and juniper. This site, located near a colluvial fan [REDACTED] consisted of three square pithouses separated from each other by less than 4 meters. The structures ranged in size from 2.5 meters to 4 meters square, and all were constructed of colluvial sandstone boulders. Despite the energy expended in the construction of the pithouses, there was no evidence of permanent or long-term occupation. No artifacts of any kind were observed on the site surface, although daylight was fading at the time the site was visited and a detailed inspection of the site was not possible.

It is emphasized that the 2006 surveys did not sufficiently examine land-use patterns along the Green River corridor. Only areas around the mouths of selected side drainages were examined, and all sites identified were clearly within the spatial range of individuals living around the mouth of side canyons. Based on the distribution of sites [REDACTED]. Furthermore, site types (primarily granaries and rock art) are remarkably consistent regardless of distance from the mouth of the side canyon or distance into the side canyon itself.

Data Analysis

The catch-as-catch-can nature of archaeological research in the Desolation Canyon corridor has yielded only the barest minimum of data relevant to placing cultural resources into proper temporal context. Only one radiocarbon date has been previously reported from the NHL, that coming from 42Cb109, a masonry granary site [REDACTED]. A corncob recovered by BLM archaeologist Blaine Miller in the mid 1990s returned a radiocarbon date of 1190 ± 80 B.P. with a 2 Sigma calibrated range of A.D. 663-1017 and a median intercept of A.D. 833 (date reported in Spangler 2002). This date is somewhat earlier than maize radiocarbon dates from Range Creek and Nine Mile Canyon.

In an attempt to better define the temporal range of prehistoric occupations in Desolation Canyon, several organic artifacts were collected for potential radiocarbon analyses. These included a willow fragment from Feature A at 42Cb83, a granary [REDACTED] two corncobs from a possible midden area at 42Cb221 near [REDACTED]; a corncob and piece of juniper bark from 42Cb441, a shelter located [REDACTED]

[REDACTED]; and a corncob from 42Cb2588, a collapsed granary located [REDACTED]. In addition, an intact winnowing tray and a sample of associated organic materials were collected from 42Cb2589.

Two radiocarbon dates were subsequently obtained from 42Cb2589, one from the winnowing tray and one from the associated organic materials. An additional date was obtained from the willow fragment from 42Cb83 and a fourth date was obtained from a corncob collected from 42Cb2588. These data are summarized in Table 5.

Table 3
Radiocarbon dates

Site	Material	Conventional 14c Age	2 Sigma Range	Intercept	Beta
42Cb83	Willow	1020 \pm 40 BP	970-1040 AD 1100-1120 AD	1020 AD	B-227644
42Cb2588	Maize	1070 \pm 40 BP	890-1030 AD	980 AD	B-227645
42Cb2589	Willow basket	310 \pm 40 BP	1460-1660 AD	1540 AD	B-225989
42Cb2589	Organics	320 \pm 40 BP	1460-1660 AD	1560 AD	B-225990

Note: All calibrations as per Beta Analytic database INTCALO 4.

Flat Canyon Basket Cache

A flat willow basket, initially identified as a possible parching tray, was recovered from site 42Cb2589 on September 20, 2006. This site is in an alcove [REDACTED]

[REDACTED] The basket was easily visible through a 0.5-meter diameter naturally eroded hole in the sandstone at the south edge of the alcove. A small portion of the basket was visible amid the rubble from within the alcove. Upon discovery, the basket was largely buried by sandstone debris that had sloughed from the roof of the alcove. There appeared to be potential cultural deposits 1-to-2 meters north of the basket, evidenced by debris slipping into cavities beneath the overburden and pieces of foreign vegetal material protruding from the surface.

More than half of the basket was supported by a large stone slab below the basket. The remainder was unsupported and had draped over the edge of the slab and rested on a lower surface, likely causing the curvature of the basket as observed upon discovery. The basket was overlaid first with grasses and then by juniper bark. Grass and bark were also wrapped around the edges and stuffed behind the basket. Two large, thin (3 to 4 centimeters), curved stones may have been placed on top of the basket at the time it was deposited in the shelter.

Given the visibility of the basket and its proximity to the [REDACTED] camp used by river visitors, state archaeologist Kevin Jones determined the basket should be collected. The first step in removing the basket was to remove the stone overburden, which consisted of materials that had spalled from the ceiling of the shelter. One stone was relatively easy to remove. A second stone had to be removed through the porthole and was difficult to maneuver. A third stone, several smaller stones, and approximately 4

liters of loose fill were then removed from the surface of the basket with some difficulty. This third stone was lying on directly over the basket. A fourth stone also covered the basket and was somewhat entangled with the grass and juniper lining, making it difficult to remove. Once the stones resting on the basket had been removed, the stone slab on which the basket was resting was removed as a flexible plastic cutting board was positioned beneath the basket to support it. The basket was then pulled through the porthole using the cutting board as support (Figure 45). Upon initial examination, the basket appeared to be covered with pitch and some areas appeared to be blackened by charring. The basket and a sample of the organic materials associated with it (Figure 46) were subsequently covered with aluminum foil and placed within a waterproof box for removal to the Utah Museum of Natural History.



Figure 45: Joel Boomgarden holds winnowing tray upon removal from shelter at 42Cb2589.

Subsequent analysis at the Utah Museum of Natural History revealed the basket is a scoop-shaped winnowing or parching tray woven in close diagonal twining. The warps are whole rod (willow) and the wefts are splints with cortex intact on one side and decorticated on the opposite side. This creates a beautiful striping pattern of dark and light rows. The start is an inverted U shape. Twining was begun on one side of the inverted U, then continues to the other side and repeats back and forth, turning the basket from convex to concave at the end of each row. The scoop shape and selvage are formed with warp elements curving to form a bundle. An addition, a rim rod was lashed to the bundle.

Some breakage was observed at the start and around the rim, and also some repair work is evident within the basket. The basket is heavily charred (pitch from the winnowing process has not been determined). During roasting, the basket could have come a little too close to flames, which would account for the charring. Because the basket was found stored with shredded bark and grass, it is possible the owner of the tray

planned to retrieve the tray for further use.



Figure 46: Winnowing tray and organic materials after removal from 42Cb2589.

The radiocarbon dates from 42Cb2589 are consistent with a radiocarbon date from a burden basket recovered from a cliff ledge in the South Franks tributary to Nine Mile Canyon. A portion of that basket returned an AMS radiocarbon date of 395 ± 70 B.P. (A.D. 1473 calibrated). The Nine Mile basket was identified as Numic based on the shape and basket weave. The basket featured an open diagonal twining, stitch slanted down to the left (Spangler 1993, 2002).

Fremont Florescence

The radiocarbon dates from the willow fragment from 42Cb83 and corncob from 42Cb2588, both granary sites, are consistent with the majority of radiocarbon dates from elsewhere on the West Tavaputs Plateau that appear to reflect a Fremont farmer-forager florescence between about A.D. 1000 and 1100. In Range Creek, the median intercepts of nine out of 10 radiocarbon dates fall between about A.D. 900 and A.D. 1050. The radiocarbon data from Nine Mile Canyon are more complex but reflect the same general pattern. Of the 21 radiocarbon dates reported there, two are attributed to earlier Formative times and five were derived from Ancestral Ute artifacts or associated materials. Ten other radiocarbon dates have median intercepts between about A.D. 900 and A.D. 1050, whereas two dates have median intercepts in the mid-A.D. 1100s and two others between about A.D. 1200 and A.D.1300. These data are generally consistent with Nine Mile Canyon tree-ring dates that reflect construction dates in the 950s, 1060s and 1150s (Schulman 1948:14).

When all radiocarbon data from the West Tavaputs Plateau are considered collectively, 25 of 34 dates (74 percent) appear to be associated with a Fremont florescence during late Formative times, with 12 percent of dates associated with earlier Formative occupations and 15 percent with Ancestral Ute occupations. The emergence of late Formative agricultural adaptations uniquely suited to the Tavaputs Plateau probably occurred within the context of major climatic changes, in particular the persistent droughts that plagued much of the western United States. In particular, three droughts, one in the late A.D. 900s to early A.D. 1000s, another in the mid A.D. 1100s and another in the late A.D. 1200s, appear to have had pan-regional impacts. The first drought coincided with dramatic population declines among the Fremont living in northeastern Utah and the eastern Great Basin, and it appears to have coincided with the emergence of defensive strategies in Tavaputs Plateau. The second drought resulted in the abandonment of most of the great houses in the central San Juan Basin, and in population declines throughout the Southwest, including the Tavaputs Plateau. The third drought resulted in the abandonment of remaining Anasazi and Fremont population centers, including the last remnants living in the Tavaputs Plateau, beginning about A.D. 1280 (Benson et al. 2007).

The effect of these droughts on Fremont populations is poorly understood, and population expansion and contraction was not synchronous across the entire Fremont region. Population declines occurred in the northeastern Great Basin at A.D. 1050, 1160 and 1290 (Berry and Berry 2003), and in the Uinta Basin by about A.D. 1000 (Spangler 2002). Based on radiocarbon frequency curves for the greater Uinta Basin, which includes the Tavaputs Plateau, an overall population decline may have begun during the drought of the mid A.D. 1100s that resulted in a major depopulation of the Tavaputs Plateau. A persistent drought in the late A.D. 1200s may have had little effect on areas that were already largely depopulated, but it may have proved a death knell for remnant Tavaputs populations. Only two Nine Mile Canyon radiocarbon dates, both from granary sites, reflect median intercepts between A.D. 1200 and A.D. 1300.

Summary

The intuitive surveys conducted within the Desolation Canyon corridor in 2006 were neither comprehensive nor systematic. However, these efforts constitute the most substantial effort to date to document all cultural resources within selected areas of the corridor, and it represents a valid “first step” in an ongoing process to identify the nature and distribution of archaeological sites, and to describe the impacts observed at these National Register sites. Consequently, the interpretations offered here represent inductive considerations based on an extremely limited database. It is quite probable that future investigations will greatly modify these initial interpretations of prehistoric adaptations along the Green River corridor.

It appears from a cursory examination of Rock Creek, which has permanent water and arable land, that site density is exceptionally high, and that land-use patterns include an entire suite of residential structures, storage facilities, rock art locales and water control features. Sites in Flat Canyon are indicative of small, easily accessible storage

structures and rock art locales located along the first cliff level above the Green River floodplain and on the north side of the side canyon. There is no difference in the types and distribution of sites inside Flat Canyon or along the Green River corridor.

No evidence was identified of permanent or semi-permanent occupation [REDACTED] [REDACTED] neither of which have arable land or permanent water. However, rock art sites and granaries are located near the mouths of both canyons, which is consistent with observations at Flat Canyon. Both granary sites are probably associated with the caching of agricultural resources resulting from farming of the Green River floodplain rather than the interior side drainages.

It is emphasized that most of the site drainages investigated in 2006 are shorter and narrower than either Range Creek or Nine Mile Canyon, and the steep nature of the topography appears to have resulted in a greater amount of erosion and greater deposition of soils and stone from runoff from the steep side canyons. These cycles of erosion and deposition could have erased or obscured some portions of the archaeological record. Geomorphology studies are anticipated in 2007.

Most of the limited data are consistent with ephemeral occupations of areas around the mouths of side drainages by farmer-foragers who arrived in the spring to prepare fields and plant maize, but who may not have remained at these localities a significant period of time, or that they left behind young and elderly members of the community to tend crops. The lack of evidence for chipped-stone artifacts, groundstone and ceramics suggests that planting and harvesting may have been exclusive activities at these localities. However, the creation of petroglyph panels, some quite elaborate, is an energy-expensive activity that may be indicative of longer-term occupations by some individuals. Some of the rock art styles are similar to styles defined for Archaic peoples on the northern Colorado Plateau and could be evidence of human exploitation of the canyon corridor for many millennia, although it is speculative to assign temporal context to these sites. It should be noted that none of the storage sites have associated rock art. This is in decided contrast to many of the storage sites documented in Range Creek and Nine Mile Canyon.

Generally, the sites documented by the 2006 reconnaissance are in good or excellent condition, even at sites with high levels of public visitation. Only five instances of suspected vandalism were identified, although it is emphasized that this evidence is equivocal. None of the impacts appear to be recent. Given the small sample size, no distinct pattern to suspected vandalism and/or graffiti was identified. There is very little evidence of pedestrian impacts to cultural resources, although there remains a potential that trails could expose subsurface deposits not currently evident on the site surface. In some instances, there are a multitude of trails leading to a site, whereas a single trail would have minimized potential impacts to cultural and environmental values.

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