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Shasta-Trinity
National Forests

South Fork
Management Unit

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Natural Bridge Management Assessment

TRINITY COUNTY CALIFORNIA

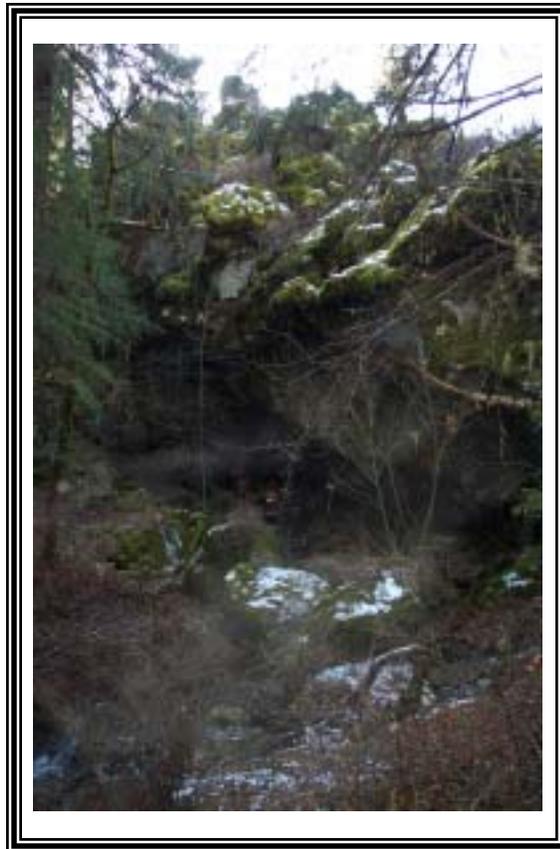


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EXECUTIVE SUMMARY

Natural Bridge is a unique geologic feature connected to a significant prehistoric Native American use and a tragic historic event. The “Bridge” itself is a large limestone outcrop that Bridge Gulch has eroded a tunnel through. This feature has many small caves and cervices that have been slowly opened over the years by the action of water eroding out the limestone. This is the same process that forms limestone caves and formations throughout the world.

Natural Bridge is a Lower Cretaceous marine formation. The limestone making up this feature and many others in the immediate area was formed in shallow warm water by corral animals. These corral reefs surrounded volcanic islands lying offshore from the shoreline of what was then the west coast of North America. What is left of one of these islands is the granitic rock making up Chancelulla Peak five miles to the east. Over the subsequent 65 million years as the North American Plate moved westward, this area along with most of northwest California was sub-ducted and uplifted to form the mountainous area making up this part of California.

During the course of human history over the past 5,000 years this feature in particular because of the cave came to have spiritual importance to the local Nor-Rel-Muk Wintu people. According to ethnographies of the Wintu people and in particular the Nor-Rel-Muk tribe of the Wintu Natural Bridge is a location of powerful supernatural forces. According to Dubois (1935:pg. 70-81) sacred places were generally used by men and women, especially unmarried or menstruants, avoided them. The Nor-Rel-Muk today travel to Natural Bridge to seek guidance from the spiritual power there for various reasons. However, the old taboos on menstruant women are still observed (Endicott 2004: personal communication). Within this area of the Trinity National Forest there are other limestone outcrops that may have had similar supernatural powers.

However, it was the Natural Bridge Massacre that has made this site historically significant to the Nor-Rel-Muk. In 1852 in response to the murder of a prominent local citizen north of Weaverville named Colonel Anderson, a posse led by Sheriff Dixon tracked the Indian party responsible up over Hayfork Mountain down into Hayfork Valley. They continued to follow this group out of Hayfork Valley up Hayfork Creek to Bridge Gulch. Heading up Bridge Gulch the posse came to Natural Bridge and just upstream from it found a large encampment of Indians. Believing this was the group responsible they encircled the camp and proceeded to kill 150 to 300 Indians. According to accounts only two (some say three) individuals survived. The two survivors were all children.

However, the last surviving full-blooded Nor-Rel-Muk in Hayfork Grace McKibbin told interviewers a different story. The young warriors responsible for the murder of Colonel Anderson passed by Bridge Gulch heading up Hayfork Creek in the night. What the posse found at Natural Bridge was a small village of mainly women and children, whose men folk were out hunting at the time. These people had no idea Sheriff Dixon’s posse was hunting them. Attacking at daylight the posse killed in this account nearly 300 Indians, mostly women and children.

This event has been a shadow over Trinity County for the past 150 years. Euro-American histories written in the latter 19th-century mentioned this event, but softened the violence with vague rationalizations. But, the descendants of the Nor-Rel-Muk still have hard feelings about this event and consider Natural Bridge a symbol of the brutality and discrimination visited upon their people during the mid to late 1800's. The current situation at the Bridge, with the impacts of recreational use, perpetuates these feelings of discrimination and lack of respect.

During the 1860's the site of the massacre was placer mined and a small cabin and home site was built. After 1906 when the Trinity National Forest was proclaimed, mining in the immediate area of Natural Bridge declined. Subsequent management of the site by the Forest Service focused on its unique geological characteristics. In the 1970's a day use campsite was put in just downstream of Natural Bridge.

Management of the site by the Forest Service over this period has been a problem. Limited recreational funding has kept the local Ranger District from fully developing an interpretive campground program or having a regular and frequent patrol presence at the site. Because of this, and the site's seclusion and ease of access Natural Bridge has been an ongoing party site for local residents. This situation has also led to much defacement of the limestone cave features and rock face. Consequently, this has dismayed and angered the Nor-Rel-Muk over the years.

We come now to the climbing issue. In the spring of 2000 Forest Service personnel started to notice climbing hardware on the south face of Natural Bridge. In addition, a climbing web site was found for Natural Bridge that showed drawings of the rock outlining various routes. Given impacts that have occurred to the site over the years and the ongoing concern of the Tribe we started looking into what management action we could take to protect the site. The climbing website and hardware left on the rock came to the attention of the Nor-Rel-Muk. In a meeting with the tribal council the District heard a lot of anger and concern that something be done to stop the rock climbing and also deal with the ongoing destruction of the site by the public.

The climbing issue has also made it into the local newspapers. The Trinity Journal has written two articles about this issue at Natural Bridge. The Record Searchlight out of Redding has also published two articles. Further, the Forest has received a letter signed by 20 climbers asking us not to stop climbing at Natural Bridge. A local climber from Lewiston, CA has also contacted us offering to help in the planning and analysis process to help come to some solution to this problem. Current work includes this assessment and the collaborative efforts with the Nor-Rel-Muk and local climbing community working towards a voluntary climbing closure for Natural Bridge.

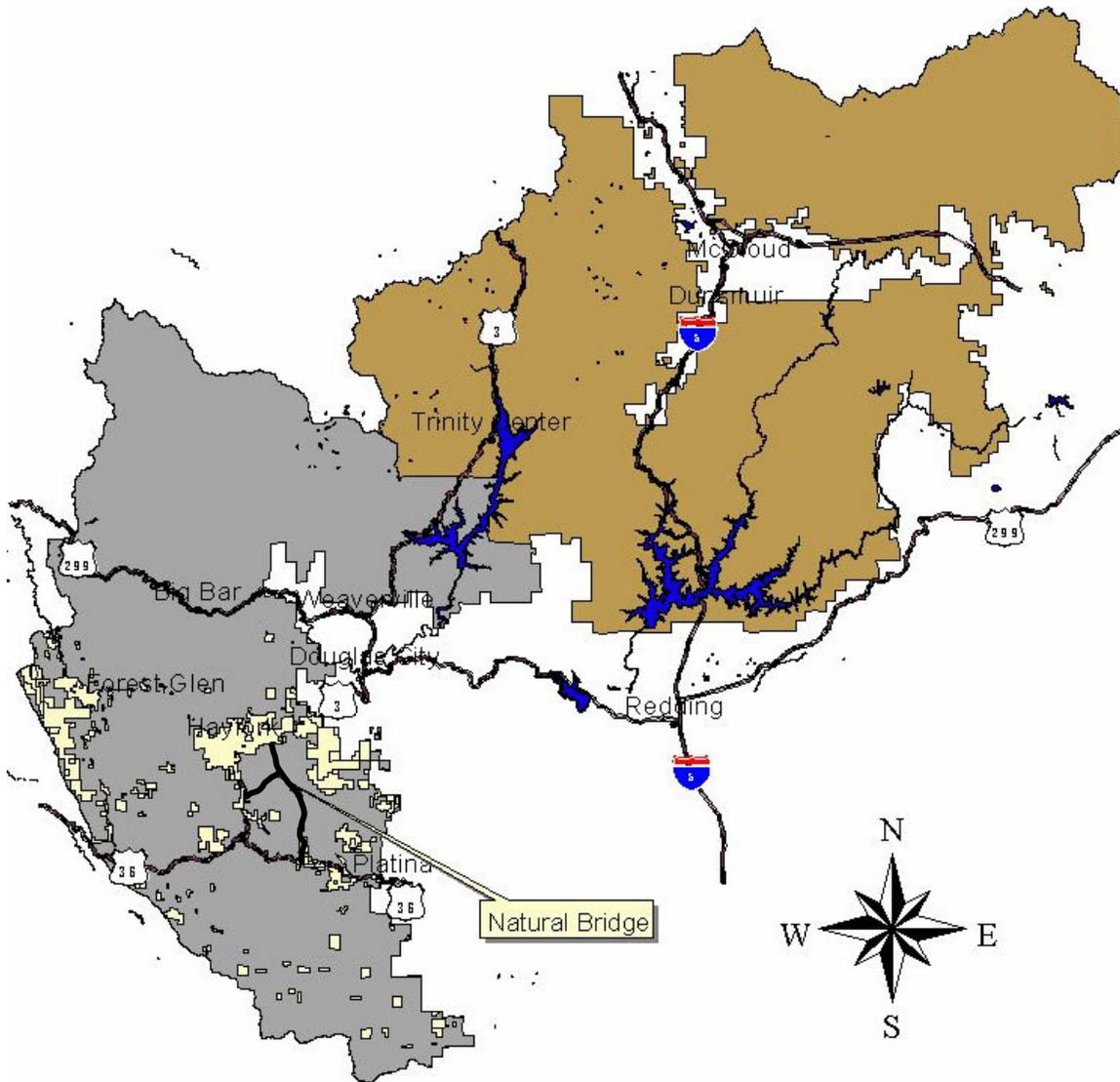
This assessment's job is to identify the various issues and concerns centered on Natural Bridge. In this way, the Forest Service can start to develop management strategies designed to restore the area. Further, this assessment looks at the entire area where the solutions and actions taken are balanced to account for both resource and human needs.

What constitutes the assessment area surrounding Natural Bridge? This is the area surrounding Natural Bridge that could influence how this site is used. This use could be both of settlement or spiritual importance. From this area resources were acquired and brought to the site and is linked to Natural Bridge by landscape elements of vegetation

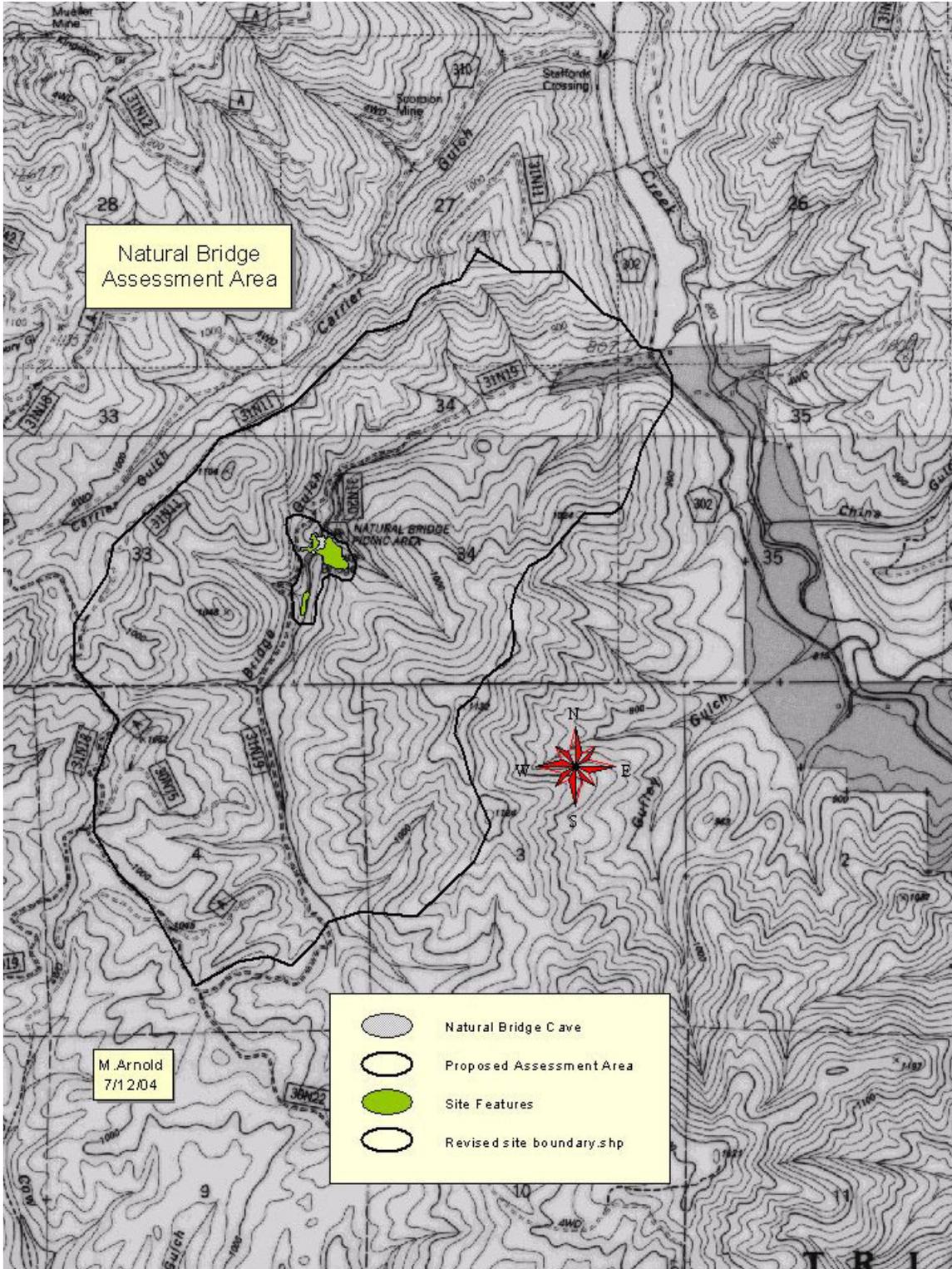
and geology. A management definition would state that this area is where changes to the vegetation character or topography may have visual, auditory, or atmospheric effects to the Natural Bridge site. The size of the assessment area is approximately 1300 acres.

The site of Natural Bridge is the immediate area where cultural activity centered on this physical feature took place. Connected to this site is also the historic event of the Natural Bridge massacre that took place in the immediate vicinity of this feature. The size of this site is approximately 26 acres.

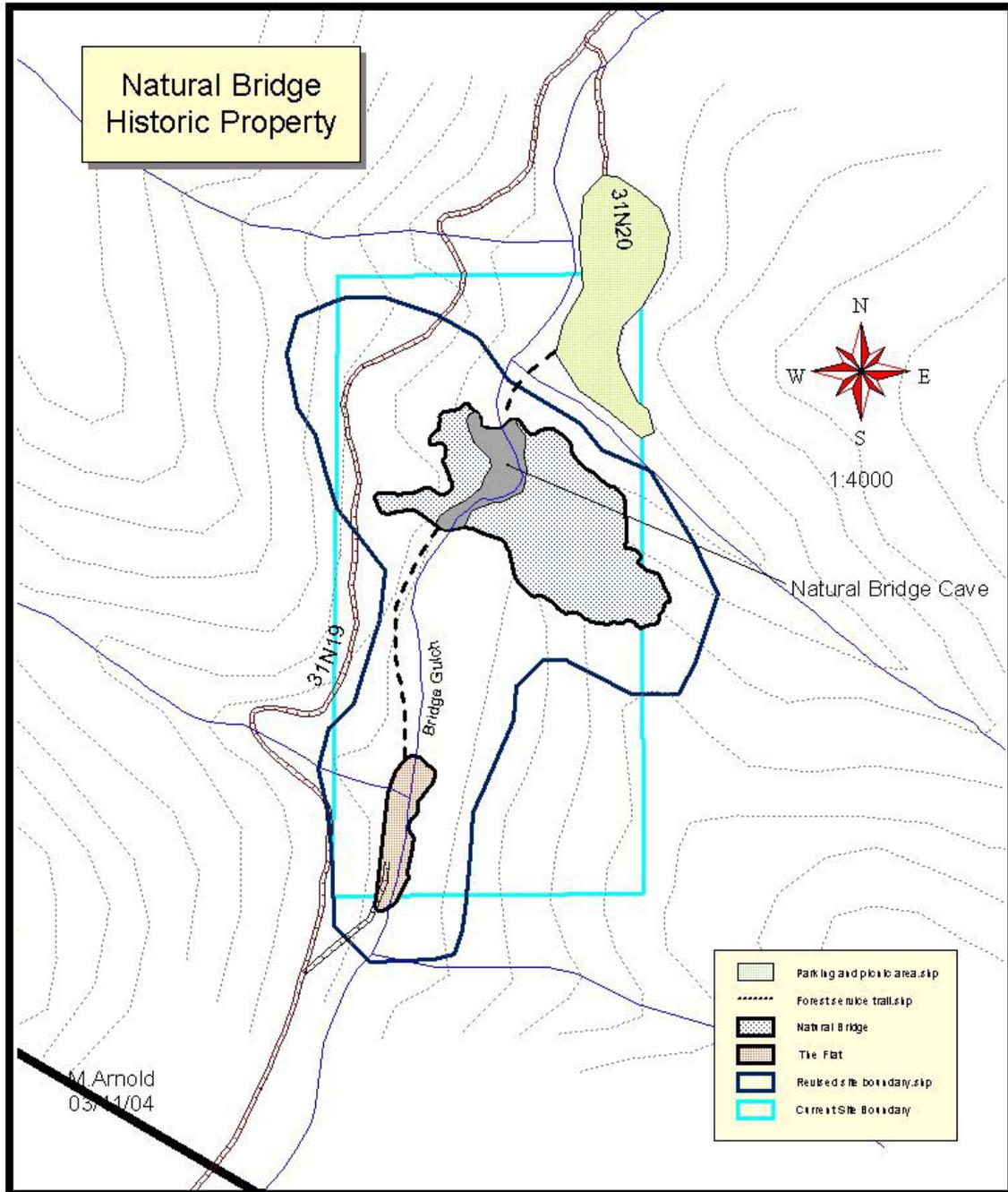
VICINITY MAP SHASTA-TRINITY NATIONAL FOREST



Map 1: Showing the location of Natural Bridge in relation to the rest of the Shasta-Trinity National Forest.



Map 2: This map shows the assessment area surrounding the current and revised site boundaries for Natural Bridge.



Map 3: This map shows the immediate site area around the Natural Bridge geological feature.

1-0 PURPOSE

The purpose of this assessment is to develop management recommendations for Natural Bridge assessment area that will integrate public use and natural resource concerns. The assessment area boundaries will be developed and defined. We will relate Prescription XI and Special Interest Area (SIA) direction in the Forest Land and Resource Management Plan (LRMP) to this area. Related to these two management directions will be the massacre National Register eligible property. This document will be the foundation for the Forest and its partners to move ahead with project proposals through public planning, funding, implementation, and monitoring phases. This assessment will also insure management recommendations comply with the laws, policy, and Forest Plan guidance for management of this special resource. The goal is to foster ownership and concurrence among all stakeholders on the actions taken to take care of this special place.

The primary issues driving this analysis effort are:

Impacts of rock climbing to the spiritual values attributed to Natural Bridge by the Nor-Rel-Muk Wintu.

The natural resource values (wildlife, geologic, etc.) at Natural Bridge are suffering adverse impacts from ongoing unmanaged recreation use.

The Townsend's Big Eared Bat roosts within Natural Bridge and what may be the adverse effects to its habitat from current use.

Key questions addressing these issues are:

What actions can be taken to mitigate adverse impacts to the Natural Bridge outcrop and surrounding area by the public of the day use campground?

How do we handle the effects from recreational climbing be it sport or scramble?

How do we deal with recreational impacts of graffiti, garbage, and destructive ATV use?

How do we help to preserve the qualities associated with the Bridge that give it spiritual and historical importance?

2-0 PUBLIC PARTICIPATION

Because of the recreation values and experience at stake along with the traditional Native American values, public participation is vital to meeting our obligations to hear and document public concerns. Input has been elicited from Trinity County Board of Supervisors, Trinity County Office of Education, and the Nor-Rel-Muk Wintu, members of the rock climbing community, caving community, and various internal Forest Service resource specialists. Additional contacts have been made with members of the general public who go to Natural Bridge simply to enjoy the atmosphere and interesting geology.

A series of meetings have been held with interested publics. Initial meetings were held to explain the purpose of this Heritage Analysis and the need for public input into this process. In this we expressed the hope that this process would lead to recommendations jointly agreed upon and developed. From these recommendations actual projects could be forthcoming. Further, having recommendations in hand would help in articulating to internal Forest Service and external funding entities projects needing support.

A primary goal of these public meetings was not only for the Forest to hear the publics concerns and suggestions, but to bring to the table the various interest groups who held antithetical views about the use of the Natural Bridge area. By meeting and sharing views and the strong feelings held by some (based on historical events and cultural practices), we hoped to break through misconceptions and fears and develop areas of common interest. Coming out of this should be shared goals and recommendations formulated in a collaborative manner. From these recommendations potential actions will be developed and taken over into National Environmental Planning Act (NEPA) planning process. See Appendix A for details.

3-0 GUIDING LAWS, REGULATIONS, AND POLICY

Below are listed brief annotations of the various laws, regulations, and Forest Plan directions referred to in this heritage management assessment.

Laws and Regulations

National Historic Preservation Act of 1966. An act to establish a program for the preservation of additional historic properties throughout the Nation. Section 106 of this act stipulates that Federal agencies need to take into account the effects of an undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register.

Associated regulations of this Act pertinent to this assessment and future actions are *36 CFR Part 800: Protection of Historic Properties* whose purpose is to accommodate historic preservation concerns and needs of Federal undertakings (this regulation is referred to in shorthand as the Section 106 process) and *36 CFR Part 60: National Register of Historic Places*. Authorizes the Secretary of the Interior to expand and maintain a National Register of districts, sites, building, structures, and objects significant in American history, architecture, archeology, engineering, and culture.

National Environmental Policy Act of 1969 (NEPA). An Act of Congress that declared a National policy to encourage productive and enjoyable harmony and protection of the environment. In particular, for Heritage resources this act directs Federal agencies to utilize a systematic, interdisciplinary approach, which will insure the integrated use of the natural, and social sciences and the environmental design arts in planning and in decision-making, which may have an impact on man's environment.

Archaeological Resources Preservation Act of 1979 (ARPA). Purpose of this act is to secure, for the present and future benefit of the American people, the protection of archaeological resources and sites which are on public lands and Indian lands, and to foster increased cooperation and exchange of information between governmental authorities, the professional archaeological community, and private individuals having collections of archaeological resources and data obtained prior to October 31, 1979.

Associated regulations of this Act pertinent to this assessment and future actions are *43 CFR Part 7: Protection of Archaeological Resources*. These regulations enable Federal land managers to protect archaeological resources located on public lands and Indian lands of the United States.

Native American Graves Protection and Repatriation Act of 1990 (NAGPRA). Purpose of this act is to protect and return to Native American tribes and group's burial remains and associated funerary objects that have been found on Federal lands.

American Indian Religious Freedom Act of 1996 (AIRFA). It is the policy of the United States to protect and preserve for American Indians their inherent right of freedom to believe, express, and exercise the traditional religions of the American Indian, Eskimo, Aleut, and Native Hawaiians, including but not limited to access to sites, use and possession of sacred objects, and the freedom to worship through ceremonials and traditional rites.

Endangered Species Act of 1973. An act requiring all Federal departments and agencies shall seek to conserve endangered and threatened species and shall use their authorities in furtherance of the purpose of this Act.

Cave Resources Protection Act of 1988. Established requirements for the management and protection of caves and their resources on Federal lands, including allowing the land managing agencies to withhold the location of caves from the public, and requiring permits for any removal or collecting activities in caves on Federal lands.

Shasta-Trinity National Forest Land and Resource Management Plan

Final environmental Impact Statement, Land, and Resource Management Plan, Shasta-Trinity National Forest. Table II-3, pg. II-29, Special Area Management, Prescription X. This prescription provides for protection and management of special interest areas (SIAs) and research natural areas (RNAs). Protection and management of associated amenity values, including unique plant, animal, and aquatic systems, would be consistent with special area objectives.

Final environmental Impact Statement, Land, and Resource Management Plan, Shasta-Trinity National Forest. Table II-3, pg. II-29, Heritage Resources, Prescription XI. The primary theme of this prescription is protecting designated cultural resource values, interpret significant archaeological and historic values for the public, and encourage scientific research of these selected properties. Visual resources, water quality, wildlife habitat, and vegetation would be protected.

Final environmental Impact Statement, Land, and Resource Management Plan, Shasta-Trinity National Forest. Aquatic Conservation Strategy (ACS). In the Shasta-Trinity National Forest LMP the objectives for ACS are described below:

1. Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted.
2. Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas of critical or fulfilling life history requirements of aquatic and riparian-dependent species.
3. Maintain and restore physical integrity of the aquatic system, including shoreline, banks, and bottom configurations.
4. Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.

5. Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.
6. Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.
7. Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.
8. Maintain and restore the species composition and structural diversity of plant communities in riparian areas and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.
9. Maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian species.

Final environmental Impact Statement, Land, and Resource Management Plan, Shasta-Trinity National Forest. Riparian Reserve Standards and Guidelines (S&G's) Chapter 4, pgs. 4-55-4-58. These S&G's are relevant to the natural resources and social uses of the Natural Bridge analysis area. There are five categories of streams that require certain widths of riparian vegetation bordering a stream or body of water that will be protected.

Since Bridge Gulch is a fish-bearing stream the S&G's future analysis may recommend adjustment of the dispersed and developed recreation elements at the site that could improve the attainment of Aquatic Conservation Strategy objectives.

4-0 CHARACTERIZATION AND REFERENCE CONDITIONS

Physical History

The Natural Bridge property includes two distinct physical features connected by a common prehistoric use and historic event. The “Bridge” itself is a large limestone outcrop that Bridge Gulch has eroded a tunnel through. This feature has many small caves and crevices that have been slowly opened over the years by the action of water eroding out the limestone. This is the same process that forms limestone caves and formations throughout the world. Bridge Gulch flows to the east-northeast for one mile further to its confluence with Hayfork Creek. Natural Bridge is a Lower Cretaceous marine formation. The limestone making up this feature and many others in the immediate area was formed in shallow warm water by corral animals surrounding volcanic islands lying offshore from the western shoreline of North America. What is left of one of these islands is the granitic rock making up Chanchelulla Peak five miles to the east. Over the subsequent 65 million years as the North American Plate moved westward, this area along with most of northwest California was sub-ducted and then uplifted to form the mountainous area making up this part of California. The part of the limestone left from this orogeny and metamorphism is Natural Bridge itself.

The second physical feature making up this site is a small grassy flat 120 meters southwest of the limestone outcrop upstream along Bridge Gulch. It has been discussed in local history that the flat was where the infamous Bridge Gulch Massacre of 1852 occurred. However, it must be noted that the massacre event involved the entire Natural Bridge site area.

During prehistoric and early historic time the landscape surrounding Natural Bridge was far different than today. If one went back in time to the aboriginal era the landscape mix would have looked very different. Today there is in the area large patches of ceanothus and other shrub species. But, in the past these large patches were not present. Due to natural fire and fire set by native peoples kept these shrubs to smaller concentrations. Hardwoods and conifers of today would still be present but their density would have been less. Stream flows along Bridge Gulch would have been larger due to less vegetation taking up excess water. Consequently, limestone cave formation development may have been more rapid than today.

Human History

The earliest known documented use of Natural Bridge by people comes from the tragic event of the 1852 massacre. Interview evidence from local informants suggests there was an archaeological deposit of prehistoric use in the immediate area. However, subsequent historic use through mining and demolition work has removed these deposits. Further, archaeological survey may reveal something, but efforts to date have not proved fruitful. In 2003 South Fork Management Unit archaeologists resurveyed the area of the massacre

and the hillsides above Natural Bridge. Results were negative for any Native American cultural remains.

However, prehistoric use of Natural Bridge can be inferred from ethnographic accounts of Nor-Rel-Muk Wintu culture. Natural Bridge had a Wintu place name *qokci tcoptci* (skinned hide or bundle of hides) (Bauman 1980:pg. 125). In Wintu culture areas like Natural Bridge, prominent rock outcrops, waterfalls, springs, etc., were features within the landscape that held supernatural power. People within this tribe sought out these locations to seek the aid from these powers. From this historic and ethnographic information we can infer this location was used at least in late prehistoric times. In addition, the area around Natural Bridge was utilized for various plant resources. Examples would be hazel along the streams (for basketry), oaks up on the hillsides (used acorns for food), manzanita (food), and maidenhair fern (used also in basketry) growing around wet spots on Natural Bridge.

The first historic mention of Natural Bridge comes from the massacre of 1852. This event was brought on by the murder of a prominent local citizen Colonel Anderson in the Weaverville area. Anderson was a butcher by trade. A group of Indians, supposedly Wintu warriors, attacked him and stole the small herd of cattle Anderson was driving to Weaverville.

The community in Weaverville was enraged by this event and formed a posse made up of between 30 and 40 men. Sheriff Dixon led the party as they tracked the Indians who committed this incident up and over Hayfork Summit into Hayfork Valley. This posse was starting to become discouraged and was going to turn back when they met two miners who had just discovered Natural Bridge and from the top of it spotted what they called an Indian Village upstream of the Bridge. Dixon's party were joined by more local miners and traveled up Hayfork Creek to Bridge Gulch. In the predawn hours of April 23, 1852 this party made its way up Bridge Gulch and surrounded this village. The Dixon Party attacked at first light. The ensuing massacre resulted in the deaths of over 100 Indians, men, woman, and children. White accounts claim around 125 to 150 Indians slain, Indian accounts place the number near 300. No whites were reportedly killed and only one wounded.

There were survivors from this attack; two to three were documented to have escaped death. Two individuals were girls taken and placed with white families in Weaverville. Historic accounts state some of the bodies were buried at the site. Members of the Nor-Rel-Muk confirm this by stating that they know of burial sites at the site. However, as was stated above archaeological work in the last 20 years has not revealed any human or cultural remains from this event (Cox 1940: 98-104 and Jones 1981: 333-334).

The only cultural element left at Natural Bridge that dates from the 1850's are inscriptions. Inside the Cave of Natural Bridge are huge limestone boulders that have fallen from the roof of the cave. On these boulders are old historic inscriptions from early Hayfork pioneers that add to the sites significance. No mention is made to the massacre.

In subsequent years the area of the massacre was placer and dredged mined and a small residence was built some time in the 1930's. The Forest Service terminated this occupancy in early 1973, since there was no mining going on. The Forest Service

bulldozed the cabin and leveled off the flat where the massacre took place. Unfortunately, the area where the cabin was located may have sat on ground that had cultural material dating from the massacre and previous habitation. In the 1950's a miner William (Roy) Beam living at the site reportedly found musket balls, projectile points, and possible human skull fragments when cultivating his garden in the south half of the flat (Patton 2000: personal communication). Artifacts were collected, but were subsequently lost when his home burned. It must be noted that at this time the Forest Service did not have laws specifically banning the collection of prehistoric or historic artifacts.

In the 1970's the Forest Service constructed a day-use campground on the downstream side of Natural Bridge. In addition, an interpretive trail was put in that connected both sides of the Bridge. Unfortunately, since these facilities were constructed the local Hayfork District has not received funding sufficient to maintain or have a patrol presence at Natural Bridge. Consequently, damage to the constructed facilities and to the feature itself has not been effectively controlled.

In the summer of 1980 Natural Bridge was recorded as an archaeological site principally for its historic association with the Bridge Gulch Massacre. Later in that same year the site was nominated to the National Register of Historic Places. This nomination went to the Regional Office and on to the Keeper of the National Register. This site was deemed eligible to the National Register, but was not listed. Because it has been deemed eligible, under section 106 of the National Historic Preservation Act this site must be managed to mitigate or avoid any adverse effects to its physical and atmospheric integrity. In 1995 the site was designated as a SIA and as a Prescription XI site in the LRMP.

Landscape

Existing Landscape Character and Condition

Natural Bridge is a dramatic limestone formation carved by eons of water etching an arch, which straddles Bridge Gulch Creek. It is nestled in a cool, riparian area dominated by a mixed conifer forest with variable under story. The sense of place is couched in sweet forest smells and the temperature offers climatic relief during the hot summer months. Moss covered boulders protrude from the forest floor creating the base of a large limestone formation that stretches to the top of the gorge, jutting over the valley floor.

The Natural Bridge road 31N20 parking area is visually obtrusive. The parking area is large, dirt flat adjacent to the creek. It looks incongruent with the rich natural environment and appears not to support the LMP Standard and Guide: 4) Primitive Non-motorized Recreation.



View looking south to higher limestone Formation.



Looking out from Natural Bridge

Areas Seen/Unseen from Sensitive Viewpoints as defined by the Land and Resource Management Plan.

Per the LRMP the closest sensitive viewing areas are Road 302 (Wildwood Road) and Hwy 3. The project area is unseen from both roads, due to topography and vegetation.

Existing Scenic Condition

The area as seen from within the site meets partial retention. The forest visitor sees the natural setting first, and then identifies the human made changes, such as the road, paths, restroom, etc.

Desired Landscape Character

The desired Landscape Character would emphasize and honor the riparian, natural forested character and preserve the rock formations for generations to come.

LRMP Direction and Guidelines

Landscape Character Goals

The project area is located within a ‘Special Area Management Unit’. This prescription provides for protection and management of special interest areas and research natural areas. Protection and management of associated amenity values, including unique plant, animal, and aquatic systems, will be consistent with special area objectives. Semi-

Primitive Non-Motorized Recreation and Trail Construction and Reconstruction are activities, which are permitted. Standards and Guides include:

1. Allow off-highway vehicle (OHV) use on existing, designated roads only. Where no existing roads occur, prohibit OHV use. Close roads if necessary to maintain RNA and SIA values.
2. Management activities should be compatible with Semi-Primitive NON-Motorized Recreation Opportunity Spectrum (ROS) guidelines.

Minimum Visual Quality Objective (VQO) per Forest Plan

The LRMP has identified partial retention in the foreground (within ½ mi) for Road 302 and has identified partial retention in the middle ground (1/2 mi – 5 mi.) for Hwy 3.

Uses of the Area

Natural Bridge is utilized by local residents, the climbing community, and is considered sacred to Native Americans. The use of the area is demonstrated by the evidence of small paths leading through out the limestone formations, a dirt parking area, an old restroom and a picnic table, fire ring, climbing hardware, and circular cut holes on the rock face.

The diversity of interests of the users has created challenging management issues. For example, some of the climbers have left climbing bolts lodged in the limestone and there are round holes that look like they have been human made. This situation is viewed by the Native American as both an adverse effect to the integrity of the limestone feature itself and their traditional use of the site.



Climbing hardware and circular cut holes

The use patterns have had some effects on scenery. Currently, the climbing hardware can be readily seen, the question is: if the presence of this hardware continues for 50 years, would the rock face look the same as it does now? The potential for freeze/thaw action working where the hardware is put in must be considered over the long term.

Forest Infrastructure

The Natural Bridge picnic area is currently a day-use picnic area that was put in to allow visitation to the geologic site of the bridge and the Native American massacre site.

The Natural Bridge site itself is a published recreation destination day use area. It is signed to direct visitors to finding the location. The primary access is via forest road 31N19. State Highway 3 flanks 31N19 on the west and Trinity County Road 302 on the east.

Road 31N19 is a variable width road 10 to 14 feet. Roughly five miles in length, this level 2 road only sees periodic maintenance. As a result there are segments containing potholes, berms, ditches that need cleaning and reshaping, dips where the sag points are filled with fine sediments. However, the entire length can be negotiated with average clearance vehicle assuming a reasonably safe speed is traveled.

The actual Natural Bridge site is accessed by one of two unclassified non-system roads that intersect road 31N19. The eastern road 31N20 is the primary access to the single picnic table, campfire ring, two-stall restroom, and small parking area. Road length is estimated to be 500 feet. The intersection with 31N19 can only be approached safely from the east. However, it is obvious users are climbing the embankment to position their vehicle to switchback and multi-point turn and travel west. This is creating a maintenance problem and unsafe condition on road 31N19 as ravel from this practice is lessening available roadway and drivable width. As it is today, this road should only be recommended for use by high clearance vehicles primarily due to the rocky creek bed crossing at the bottom near the parking area. The road width is roughly 12 feet with no existing turnouts or opportunities to construct new ones.

The western road is U31N19 220 feet in length and accesses the flat on the upstream side of Natural Bridge near the seasonal creek and riparian area. Its intersection with 31N19 is ideal if departing to the west. The road surface is native with a variable 12 foot running width. A foot trail links the two roads together.

Recreation



Forest Service toilet at the day use camp ground at Natural Bridge.

Current recreation facilities at Natural Bridge day-use campground are one toilet, a small parking area, picnic table with a fire ring, and one designed trail system. The trail runs

from the campground to the Natural Bridge Cave and picks up again on the upstream end of the cave ending at the massacre site. There are several unplanned trails heading up the sides of Natural Bridge that people use to access the top of the rock feature. At one time the Forest Service had put in along the trail numbered posts tied to a brochure interpreting the natural history and human history of Natural Bridge.

Current condition of these recreation facilities and features is very poor. The toilet is not maintained regularly along with the access roads and parking area. The area has considerable garbage scattered throughout and no regular clean up. The Forest Trial is in good condition, but does not receive regular maintenance also. The unofficial trails show some evidence of erosion. Only one numbered post from the interpretive stops could be found.

Garbage problems are also found at the massacre site. Also, an impact from OHV use in particular quad runners is evidence on the slopes leading from 33N19 road. Tracks are visible on the slopes that could create erosion problems in the future. There is also non Forest Service campfire features in this area that present an unsightly look to the area. All of these impacts do not reflect well on the importance of the event that occurred here.

Numbers of visitors who come to see or climb Natural Bridge in a year are not known. However, inferential observation and discussion with local officials indicates that Natural Bridge is used frequently for partying and over night camping. However, this disruptive use is only by a few. The majority of the public comes to enjoy Natural Bridge and its beauty in a respectful way.

Hydrology

Overview

There are three roads and an unimproved trail system within the assessment area that may provide a source of sediment to Bridge Gulch during and following runoff events. These features are discussed in detail in the following section.

Resource Characterization

Geomorphic Processes

Three distinct geomorphic processes—hillslope erosion, overland flow, and solution weathering—are predominant in the upland environment. The local geology (limestone, metasediments, and isolated igneous intrusions) controls the depth and development of the soil profile. The limestone escarpment known as Natural Bridge severely limits soil development and, in fact, displays the karst topography associated with solution weathering. These geomorphic processes have resulted in the physiographic upland features of the assessment area.

Bridge Gulch is the primary riparian feature in the assessment area. Although it may show minimal evidence of surface flow throughout its length, it is characterized as a perennial watercourse on U.S. Geological Survey and Forest Service maps. This feature has developed over time in response to hydrologic conditions, localized erosional processes, and tectonic activity. This stream has three distinct segments: Bridge Gulch

Flat (upstream of Natural Bridge), Natural Bridge (cavern within the limestone body), and Lower Bridge Gulch (downstream of the limestone feature to the confluence with Hayfork Creek).

Bridge Gulch Flat

Upstream of Natural Bridge, Bridge Gulch has a well-developed channel within a broader depositional feature. The relatively flat landscape suggests that the stream was dammed by natural causes for some period of time, and sediment was deposited upstream of Natural Bridge for almost one mile. The size of this depositional feature and textural characteristics observed within the incised channel promote the hypothesis that multiple occurrences of impoundment and subsequent incision to a new base level have occurred over geologic time. The presence of mature conifers and hardwoods in several locations suggests that no substantive depositional events have occurred in the past several hundred years.

Within recorded history, there is evidence of several eras of human occupation and disturbance. Records indicate that there was substantial use of this reach by Native Americans for some period of time. Subsequent to that period, several episodes of mining activity resulted in extensive modifications to this reach. Evidence of tailings piles and the limited sinuosity of the channel suggest that historic mining activity resulted in modifications to the channel (fill, berms) that altered the location and/or gradient. Oversteepened banks and a noticeable accumulation of fine sediment in the pools suggest evidence of channel incision. If this condition will need to be monitored and corrected if needed.

Natural Bridge

Within the cavern, Bridge Gulch flows in a semi-subterranean environment among large clasts of limestone that are presumably the result of breakdown associated with solution weathering. Because of the large size of these clasts, the channel bed and bank features are not well defined. Where there are discernible channel features, the substrate is typically cobble through boulder sized. The larger particles are limestone, with a small proportion of alluvial material in isolated areas. Due to the nature of karst hydrology, it is difficult to determine the proportion of discharge observed in the cavern that is contributed by the subterranean environment. Numerous locations within the cavern suggest contributions to the apparent flow of Bridge Gulch. Without discharge measurements, it is unclear if this is a gaining or losing reach. In reference to the dam phenomena hypothesis for Bridge Gulch Flat, the observable breakdown within the cavern (an erosional process in limestone bodies) reach offers a plausible explanation for episodic dams that impounded Bridge Gulch for some period of time. This could also explain the chaotic nature of the stream within the cavern (see photos below).



This picture shows the large limestone clasts or boulders that have fallen from the cavern roof. Photo is looking east upstream along Bridge Gulch.



This picture taken looking west downstream along Bridge Gulch shows the large limestone clasts.

The proximity of the cavern reach to human occupation in the Bridge Gulch Flat area may have provided opportunities to use this reach for shelter and natural resources. The potential for a long-term source of potable water adjacent to shelter may have increased the likelihood of habitation over extended time periods. Although no details are available, the potential impacts to water quality resulting from primitive sanitation facilities could have been noticeable, particularly downstream.

With the onset of mining activity in the upper Hayfork Creek watershed, the cavern and other features associated with Natural Bridge were a focal point for recreational activities. In conjunction with forest management, roads provided direct access to this area. As recreational use has increased over time, a trail network has developed within the cavern. Although there is no evidence of current long-term occupancy within the cavern, the ongoing extensive use suggests that sanitation concerns within the cavern should be considered. In December of 2003 for an example a party was held inside the cavern and large amounts of trash was left behind. This both desecrated the site and created sanitation problems. The Nor-Rel-Muk and Forest Service documented this trash after which this mess was cleaned up quietly without our knowledge.

Lower Bridge Gulch

Immediately downstream of Natural Bridge, the stream has developed a definitive bed and bank. The stream is noticeably wider than in the upstream reach, and particle sizes are well distributed. A narrow corridor of riparian vegetation extends the length of the reach, dominated by willow and alder species. As the distance from the cavern increases, the channel becomes more defined and elements of roughness (large wood, boulders) are more pronounced. Below the Road 31N20 crossing, the channel becomes confined by canyon walls, with a minimal corridor of riparian vegetation.

Under reference conditions, this reach was likely subjected to high-magnitude, short-duration flood flows on an infrequent basis in conjunction with the impoundment created by Natural Bridge. As a result, the channel was in a periodic state of adjustment in terms of sediment load, gradient, and vegetation.

Management Features and Activities

In conjunction with management of forest resources, including recreational access, the Forest Service developed and/or improved the transportation system in the analysis area. Presently, there are three roads, a day-use site, and an unimproved trail network that are used to access the analysis area.

Road 31N20

Road 31N20 is a native surface road that provides access to the Natural Bridge recreation area immediately downstream of Natural Bridge. From the junction with Road 31N19, this road extends downhill to the intersection of Bridge Gulch, an unimproved low water crossing. This segment of road is one lane with minimal turnouts and has no functional drainage structures. The lack of drainage, in conjunction with side-cast construction, increases the potential for runoff-related erosion. The absence of effective cross-drains and evidence of chronic (rills, ruts) and episodic (fill failures) erosion indicate that this segment of the road provides a direct source of flow and sediment to Bridge Gulch during

runoff events. No information is available on water quality in Bridge Gulch downstream of this crossing.



This photo shows where Forest Service Road 31N20 crosses Bridge Gulch.

Beyond the Bridge Gulch crossing, this road parallels the stream until it ends at a parking area/turnaround in the vicinity of Natural Bridge. Although this segment has minimal drainage features and is subject to surface erosion, the gentle gradients and proximity to the valley bottom limit the potential for slope wash and surface erosion. However, field observations suggest that any runoff associated with this segment has a high likelihood of direct delivery into Bridge Gulch.

Non-System Road above Natural Bridge

A short non-system road, U31N19, accesses the Bridge Gulch Flat area from Road 31N19, approximately 1/2 mile upstream from Natural Bridge. According to Forest Service records, this road was originally associated with mining activity in the Bridge Gulch Flat reach upstream of Natural Bridge. This road currently provides access to the massacre site, with several large turnouts and dispersed campsites. The location and terrain associated with this road offer minimal opportunity for concentrated runoff. Few erosional features were observed, and the distance from Bridge Gulch reduces the opportunity for any discharge during runoff events.

Natural Bridge Day-Use Area

This site occupies the general area from the escarpment of Natural Bridge downstream to the parking area. Several distinct features have been constructed over time to provide facilities for various user groups.

The parking area is located immediately adjacent to Bridge Gulch, apparently within the Riparian Reserve. In several areas, the fill slope of the parking area appears to be within the identified floodplain of Bridge Gulch. The parking area also appears to have filled in a small portion of an intermittent channel that contributes flow and sediment to Bridge Gulch on a seasonal basis. Currently, picnic table and fire rings are located on this fill, as well as in several other locations.



This photo shows the parking area for the day use area just below Natural Bridge.

Directly upslope of the parking area, is a vault toilet, however this toilet is in very bad repair. Consequently, there is evidence of human waste throughout the surrounding area. This facility is approximately 300 feet from Bridge Gulch and well above the flood plain. No obvious water quality issues were identified; however, the age and condition of the vault are uncertain.

There are a number of trails that emanate from the parking area toward the limestone caverns and cliffs. Several of these trails converge in the vicinity of Natural Bridge and continue upstream, generally following Bridge Gulch. One trail section continues all the way to the upper end of the Flat in the vicinity of the non-system road. It appears that people looking for a casual recreational experience primarily use these trails. The amount and nature of garbage observed within the cavern suggest that this trail provides

primary access to the main cavern. Historically, a range of users for a variety of social functions has used the cavern. Although these trails typically are adjacent to or within the active channel of Bridge Gulch, the durability of limestone limits the potential for erosion and resource damage. The sanitary issues appear to be the predominant impact associated with these trails.



Trail heading south from the day use area upslope towards the top of Natural Bridge.

Several other trail networks are present. Other recreational groups such as rock climbers and cavers use most of these trails. Most of these trails lead to established routes and/or small caverns. In a number of locations, these trails are extremely steep, and erosional features are evident. The soil profile associated with the limestone outcrops is extremely thin, and the lack of vegetation increases the potential for increased erosion over time. Several instances of gully development associated with these trails suggest that the geomorphic processes of this feature are affected by this casual, but repetitive, use. Another erosional process associated with recreational climbing may be occurring. In areas where bolts and other climbing equipment have been installed, there is a potential for solution weathering and sloughing. A dominant weathering process in limestone terrain is freeze-thaw, whereby the recurring action of water and ice decrease the structural integrity of the rock and large slabs may break. The installation of rock bolts, pitons, and other equipment may increase the potential for solution weathering and freeze-thaw actions to occur on some portion of this formation.

Botany

Habitat Types

Described below are the main habitat types present within the management area. Sensitive species that can be expected in each habitat type are listed with each description.

Mid to late seral mixed-conifer/hardwood forest is present in protected and riparian areas. Along Bridge Gulch Creek large diameter Douglas fir and ponderosa pine area present as well as other indicators of late-seral forest. Moderate to good lichen and bryophyte diversity is present. The forest floor is shaded with high canopy cover and a well-developed understory layer of bigleaf maple (*Acer macrophyllum*), dogwood (*Cornus nuttallii*), western hazel (*Corylus cornuta*), and oceanspray (*Holodiscus discolor*). Litter and duff layers are well developed. Species most commonly found in late-seral forest are present here including prince's pine (*Chiamaphila umbellata*), syringa (*Philadelphus lewisii*), and fairy bells (*Disporum hookeri*). This habitat type is suitable for mountain and Brownie lady's-slipper orchids (*Cypripedium montanum*, *C. fasciculatum*), English Peak greenbriar (*Smilax jamesii*), and Canyon Creek stonecrop (*Sedum paradisum*).

As you move up the slope from the riparian bottoms, conifer forest transitions into a chaparral habitat type. This plant community is dominated by black and white oak (*Quercus kelloggii*, *Q. garryana*), brewer's oak (*Q. breweriana*), birchleaf mountain mahogany (*Cercocarpus ledifolius*), buckbrush (*Ceanothus cuneatus*), and gray pine (*Pinus sabiniana*). Regardless of aspect, this habitat type is open, sunny, and drier. This habitat type is suitable for Tracy's woolly-stars (*Eriastrum tracyi*) and Canyon Creek stonecrop.

The interior of Natural Bridge Assessment Area contains a massive limestone rock outcrop centered on an erosion-carved archway over Bridge Gulch. Several surveys of the limestone outcrop have not revealed a separate suite of plants than those found in the conifer/hardwood forest or the chaparral habitat types that it bisects. Shasta snow-wreath, a recently described Sensitive shrub species found on limestone substrates at Shasta Lake, is not found within the management area. Many bryophyte (mosses, liverworts) and lichen species occupy the limestone outcrop. This habitat type is suitable for all the Sensitive plant species mentioned in the two habitat types described above.

Issues of Concern

Impacts to lichens and bryophytes from rock climbing, increased potential of damage to two Sensitive plant populations and increased competition from noxious weeds are three issues of concern in the Natural Bridge Management Area.

Impacts to Lichens and Bryophytes from Rock Climbing

Surface lichen and bryophyte plants have been removed during rock climbing. These are visibly absent along piton lines, but in place outside of the normal range of activity around climbing hardware lines. Bryophytes and lichens are known to play a role in water retention, although this role would be more important for those species associated

with trees and other plant species. Both organisms also provide habitat for invertebrates and birds, contribute to biodiversity, and contribute to forest floor nutrients (through rainfall leaching). Most bryophyte and lichen species require long periods of time, years to decades, to recover from damage. In the presence of repeated disturbance, recovery may never occur.

Rock climbing is experiencing a surge of popularity in the West and numbers of rock climbing visits to Natural Bridge are greater now than ten years ago. At least one guidebook identifying Natural Bridge as a rock climbing area has been published. Guidebooks of this sort have had a tendency to increase awareness of different sites and consequently visitor use. Without measures to reduce impacts to surface bryophytes and lichens, continued damage to these organisms may be expected.

Impacts to Two Sensitive Plant Populations

A population of mountain lady's-slipper and one of Brownie lady's-slipper are located on the north side of the arch. Both are located in the moist riparian zone and the population of Brownie lady's-slipper is directly adjacent to the trail. The mountain lady's-slipper population was last seen above ground in 1998 or 1999 with 2 individuals, but has not been seen since. The Brownie lady's-slipper population has produced approximately 15 individuals annually.



Cypripedium fasciculatum
Brownie Lady's Slipper



Cypripedium montanum
Mountain Lady's Slipper

The Brownie lady's-slipper population has not been impacted significantly to date, presumably because visitors have remained on the well-defined trail. Off-trail impacts to the mountain lady's-slipper population are less likely because it is located further from the trail. Despite a lowered threat of impacts, populations of rare species with limited number of individuals are much more vulnerable to permanent loss from adverse impacts.

Increased Competition from Noxious Weeds

South of the arch is the flat opening that has been used traditionally by Native Americans for gatherings and ceremonies and is the site of the historical massacre. Non-Indians also use this site on an occasional basis for recreational purposes. Non-native grasses and forbs because of perpetual ground disturbance have replaced most of the native plant species. Small amounts of bare soil are present, mostly around campfire rings and along user-created roads.

No noxious weeds of significance (State Rated A or B, i.e. diffuse knapweed, dyers woad, spotted knapweed) are known from the opening to exist in the flat, but a population of spotted knapweed (*Centaurea maculosa*) is located less than one mile north along the Wildwood Road. This is a high-priority weed (State Rated A) that is found in only a handful of small populations in Trinity County and has the potential to be extremely invasive.



The flower and bracts of the spotted knap weed.



Centaurea maculosa - spotted knap weed in bloom along a roadside.

Despite repeated use, disturbance has been kept to low enough levels that most non-native species replacement is restricted to the opening and has not spread greatly into the surrounding forest. Noxious weeds can quickly capture and occupy sites that are disturbed, especially sites that experience repeated disturbance and don't allow recovery time for native plant species. Once a site is occupied, the rate of spread of a noxious weed can be accelerated because the reproductive source (root tissue or seeds) has increased.

That said current visitor use levels in the opening have not been high enough to create a large concern about noxious weeds. OHV use also could contribute to the spread of noxious weeds throughout the Assessment Area. Although non-natives largely replace “natives in the flat” the opening, weeds don't appear to be spreading significantly into the surrounding area. The area is not botanically significant and contains two riparian species (outside of those directly adjacent to Bridge Gulch Creek). Over time the flat is expected to fill in with conifers and resemble the surrounding forest in the absence of periodic site disturbance. With an equivalent or lesser future use, this flat will continue to provide an opening that does not pose a threat to surrounding native species diversity.

With increased visitor use, noxious weeds could become a greater problem. Vehicles have long been considered a major transportation vector of noxious weeds. Increased vehicle traffic in the area of the meadow would mean both increased soil disturbance and increased opportunities to introduce significant noxious weeds to the area. While the population of spotted knapweed does not directly threaten native vegetation in the Natural Bridge Management Area, its close proximity increases the possibility of a chance introduction.

Terrestrial Wildlife

A wide variety of late-seral forest associated species are known or expected to occur within the vicinity of Natural Bridge. Threatened, endangered, and/or sensitive species in this forest cover type include the bald eagle (*Haliaeetus leucocephalus*), northern spotted

owl (*Strix occidentalis caurina*), northern goshawk (*Accipiter gentilis*), Pacific fisher (*Martes pennanti pacifica*), and American marten (*Martes americana*). The spotted owl, goshawk, fisher, and marten are also listed as management indicators for late seral forests (FEIS LRMP Appendix G, pg G-12).

Bald eagles require large trees protected from disturbance for nesting and late successional and old growth forests relatively close to large rivers or lakes for winter roosting sites (Anthony et al., 1992, USDI 1986). No occupied bald eagle activity areas (i.e., nesting, roosting, or winter roosting or concentration areas) lie within the assessment area, but perennial water and large, mature trees do provide foraging and roosting opportunities. Eagles have been reported from the vicinity of Natural Bridge, including along Hayfork Creek, approximately 1 mile east of Natural Bridge. Bald eagles are fairly conspicuous and are routinely reported by District personnel and area residents when seen, especially pairs, young, nesting activity, or winter concentrations. The level of human activity in the general area makes the possibility of nesting or roosting eagles remaining undetected in the vicinity highly unlikely.



Haliaeetus leucocephalus
Bald Eagle

The spotted owl is associated with late successional and old growth conifer forest (Thomas et al. 1990) but they can forage in a variety of other forest conditions. Traditionally the STNF defined suitable (nesting and roosting (NR)) spotted owl habitat as composed of mature conifer stands having multi-layered conditions, a canopy closure of at least 60 percent, and displaying obvious signs of decadence.

There is one northern spotted owl activity center adjacent to the Natural Bridge assessment area and three additional activity centers within 3.5 miles of the area, with one of these activity centers located approximately 1.7 miles northeast of the Bridge. A 1.3-mile radius circle approximates the median home range of spotted owls within the Klamath province (Thomas, et.al. 1990). This distance indicates that only the owls from the adjacent activity center are likely to utilize the Natural Bridge area.

Drainages provide habitat conditions favorable to dispersal between the planning area and nearby LSR/CHU. Hayfork creek (outside of private property) supports stands with protective over stories of medium to large size commercial and large size noncommercial conifers. The Natural Bridge assessment area supports 194 acres of this habitat.



Strix occidentalis caurina
Northern Spotted Owl

The goshawk is the largest North American member of the genus *Accipiter*, which includes both the sharp-shinned hawk and Cooper's hawk. The goshawk is a forest habitat generalist that uses a variety of forest types, forest ages, structural conditions, and successional stages. It primarily occupies ponderosa pine, mixed-species, and spruce-fir habitats and prefers late successional and old growth conifer forests on slopes generally less than 35 percent for nesting (Hall, 1984; Reynolds, et. al., 1992). Northern goshawks may be susceptible to disturbance during the breeding season.

The 194 acres of suitable timber stands within the Natural Bridge planning area could provide suitable nesting/roosting habitat for goshawks. District records were referenced and supplemental surveys have been conducted in the areas surrounding reported observations. No nest sites have been located within the vicinity of Natural Bridge. There are three known northern goshawk territories within the watershed. Two occur within 5 miles of the planning area, at 2.5 and 4 miles distant. Goshawks from these territories could utilize the Natural Bridge planning area for foraging.



Accipiter gentiles
Northern Goshawk

The fisher is associated with late-successional and old-growth conifer forest (Powel, et al. 1994; Freel 1991) and thus habitat conditions are similar to those for the spotted owl. Fishers use a variety of other habitat types for foraging. The Pacific fisher is known to occur within the watershed, with three sightings reported from within the Natural Bridge assessment area. Approximately 20 additional incidental sightings of fishers have also been documented from within the watershed. Drainages provide habitat conditions favorable to travel for fishers as well. The relatively continuous representation of riparian obligate trees and shrubs plus downed logs, contribute to effective travel and hiding cover along these routes.



Martes pennanti pacifica
Pacific fisher



Picture taken of a Pacific fisher three-quarters of a mile east-northeast of Natural Bridge. Picture was taken during the winter of 2004 from a camera station for a monitoring project in this area.

The marten is associated with late successional and old growth true fir forest but can occur in lower elevation conifer types. No true fir stands occur within the Natural Bridge assessment area and no martens have been reported from within the planning area or the vicinity.



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Martes americana
American marten

One night of mist netting by Pacific South West Researchers (June 03), along the creek below the Bridge, did confirm the presence of big brown bats in the area. Mist netting is a capture technique for bats that utilizes a very fine net. The net is spread across an area

the bats frequent in order to capture them. Because the netting is very fine the bats are not hurt. Currently this type of bat is a Forest Service sensitive species.

Snag and down log habitats

These habitats do not exist independent of other habitats within the watershed. No current snag density information is available within the watershed as a whole. Snag levels in late seral forest stands (3G, 4N/G) are anticipated to be the highest within the watershed, and may meet or exceed current guidelines.

No hardwood stands within the watershed are currently managed commercially. Snag levels in these stands may be at or above suggested levels. Downed large log levels within late seral stands are anticipated to meet standards and guidelines.

Management indicator species associated with snags and logs include the northern spotted owl and acorn woodpecker (*Melanerpes formicivorus*). The northern spotted owl is discussed above. Acorn woodpeckers are common in the watershed and present within the Natural Bridge planning area. Breeding Bird Survey data for the acorn woodpecker, which shows a very light increasing population trend but is very susceptible to localized availability in acorn crops (Sauer et al 2003).



Melanerpes formicivorus
Acorn woodpecker

Riparian and aquatic habitats

TES Species associated with riparian and aquatic habitats include foothill yellow-legged frog (*Rana boylei*), western pond turtle (*Clemmys marmorata*), and the Pacific giant salamander (*Dicamptodon tenebrosus*). All of the above species have been documented within the Natural Bridge assessment area, or within similar habitats adjacent to the area within the watershed.

Foothill yellow-legged frogs occur throughout the Upper Hayfork Creek watershed. This frog is found in or near permanent rocky streams in a variety of habitats including

ponderosa pine, mixed conifer, and mixed chaparral (Zeiner, 1988). This species is rarely found far from permanent water. This species has widespread distribution across the district and has been recorded from within the Natural Bridge planning area at the bridge site.



Rana boylei
Foothill yellow-legged frog

Western pond turtles have been documented from within the Upper Hayfork Creek watershed in the vicinity of streams and ponds. These sites tend to support perennial or persistent water with a wide variety of shoreline vegetation habitat types. Females are known to travel from the water source to the nest site anytime from March – August depending on local conditions. This species is also well distributed throughout the district.



Clemmys marmorata
Western pond turtle

Pacific giant salamanders were observed from within the Natural Bridge planning area. These salamanders are year-round residents. Aquatic adults and larvae are typically found in cool, rocky streams hiding within spaces between rocks, and occasionally in lakes and ponds. Terrestrial adults are found under surface litter and in tunnels underground. Eggs are laid during spring in concealed locations several feet below

surface in cold, slowly flowing water (Kucera, CWHRS). No information is available about salamander populations within the watershed.



Dicamptodon tenebrosus
Pacific giant salamander

Hardwood

habitats

Approximately 3,340 acres of Forest Service lands within the watershed are dominated by hardwoods-primarily white oak (*Quercus garryana*), black oak (*Q. kelloggii*), canyon live oak (*Q. chrysolepis*), and madrone (*Arbutus menziesii*). These stands are not currently managed commercially. The lack of management of local hardwood stands may help to maintain populations of hardwood-dependent species within the assessment area. However, if needed manipulation of these stands may be necessary to enhance habitat for species living within the hardwoods. An example of human management of these stands occurred prehistorically. These areas were burned over frequently by Native Americans to bring about better acorn crops and grazing for deer. This activity may have also reduced disease and damaging fire intensities that benefited not only the oaks themselves but also dependent species. The acorn woodpecker is the only management indicator species within this assemblage recommended for surveying and was discussed earlier.

Cliffs, Caves, Talus, and Outcrops

Little of this habitat exists within the watershed at a scale easily mapped. Natural Bridge, and the limestone outcrop it originates from support many small natural caves and openings. Talus and rock outcrops are common throughout the watershed and Natural Bridge at very small (<1/10 acre) scales, especially along some portions of Hayfork Creek. Mineshafts are also present within the watershed, but are not known from within the Natural Bridge assessment area. Peregrine falcons (*Falco peregrinus*), big brown, and Townsend's big-eared (*Corynorhinus townsendii*) bats are management indicator species listed as within the assemblage for cliff/cave habitats.

Three species of bats have been confirmed to use the Natural Bridge area. These include the silver haired, big brown and Townsend's big-eared bats. Of the three, only the big-eared bats are confirmed roosting in the area. Natural Bridge supports a maternity colony (mothers with young of the year) within the primary opening of the bridge. The colony is reported to have used the bridge for as long as people can remember. Estimates place the colony at less than 100 individuals. Although Townsend's big-eared bats are reported to

be susceptible to human disturbance, this colony has returned to this location to rear young each spring.



Corynorhinus townsendii
Townsend's big-eared bat

Survey and Manage Terrestrial Mollusks

Within the watershed, over 2,500 acres have been surveyed for Survey and Manage (S&M) terrestrial mollusks, including the suitable lands within the Natural Bridge assessment area. Two former S&M species, Church's sideband snail (*Monadenia churchi*) and the papillose tailed slug (*Prophysaon dubium*), are known to occur, but no current S&M species have been detected. The Klamath Shoulderband snail (*Helminthoglypta talmadgei*) is known to occur in the middle Hayfork Creek drainage, and may still be found to occur in the Upper Hayfork Creek watershed, but is not an issue within the Natural Bridge assessment area. This species does not currently require pre-disturbance surveys.



Monadenia churchi
Church's sideband snail



Helminthoglypta talmadgei
Klamath Shoulderband snail

Neotropical Migratory Birds

There are 66 species of neotropical migratory birds in California for which sufficient data exists to monitor population changes. Of those, 30 are either known to or possibly could occur within the Upper Hayfork Creek drainage. Two of these species, black-headed grosbeak and western tanager, show significant increasing trends from 1980-2002, and the remainder, including green-tailed towhee, do not show significant trends in population. (Sauer et al 2003)



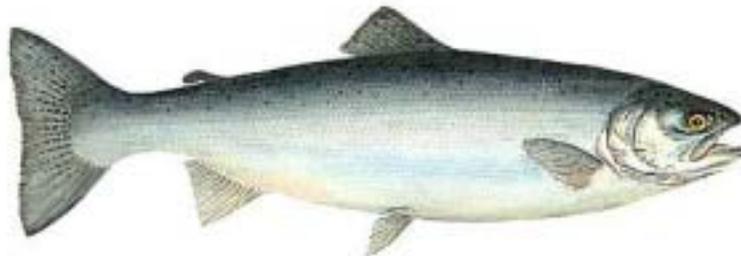
Pipilo chlorurus
Green tailed-towhee

Fisheries

Hayfork Creek, approximately one mile east of Natural Bridge, is a medium size Class I tributary to the South Fork Trinity River. This stream provides important holdings, spawning, and rearing habitat for spring-run Chinook salmon and summer steelhead in the lower reaches and for winter-run steelhead in the upper reaches. Major perennial tributaries providing cold water during the summer and woody debris during the winter into Upper Hayfork Creek are:

Carrier Gulch
Bridge Gulch
East Fork Hayfork Creek
Chanchellulla Creek
Wilson Creek
Hall City Creek
Goods Creek
String Bean Creek
Dubakella Creek

Fish species found in all perennial tributaries in the upper reaches of Hayfork Creek include winter-run steelhead (*Oncorhynchus mykiss*), speckled dace (*Rhinichthys osculus*), and rainbow trout (*O. mykiss*). The speckled dace is a small fish found throughout the Hayfork Creek and Trinity River streams.



Steelhead/Rainbow Trout
Oncorhynchus mykiss



© Jeff Foott

O. mykiss
Rainbow trout



Rhinichthys osculus
Speckled dace

Bridge Gulch is a small Class III tributary to Hayfork Creek. It is perennial 3/4 of a mile up its course, then intermittent, and finally past Natural Bridge itself ephemeral. A small population of winter-run steelhead and resident rainbow trout are found in Bridge Gulch. This stream historically becomes intermittent with isolated pools in the mid to late summer. Spawning habitat in the creek is limited (Murphy 1972, John Lang 2003, personal communication).

Fuels

At this time there is according to the fire condition class a significant fuels issue at Natural Bridge. However, even with the recreation use at the Bridge human caused fires have not been a problem. The make up and density of fuels in the immediate area of the Bridge are heavy in certain locations. Although the fire history at Natural Bridge is limited there is enough fuels, given the right conditions, in the area sufficient to carry it.

The assessment area around Natural Bridge is considered Condition Class 3. In this condition fire regimes here have been significantly altered from their historic range. Consequently, there is a high risk in losing through fire key components of the local ecosystem. Fire frequencies have departed from their historic and prehistoric norms (Schmidt 2002:41). This may increase the fire intensity, size, or severity. As been noted in historic photos from the 1930's and 1940's vegetation attributes have been altered mainly due to vegetation growth and some timber removal from past mining activity near the Bridge.

Management of traditional plants used in Native American crafts and foods are not currently part of any future fuels management in the Assessment Area. The pruning and burning of hazel shrubs and the under burning in oak habitat as examples would serve both fuel reduction and healthy plant growth. For hazel young shoots resulting from the burning are the best for traditional basketry. Under burning of oak stands improves acorn production and reduction of disease and insect pests.

5-0 SYNTHESSES

Theme 1 - Access



Undesignated access road coming off of U31N19 to the flat upstream from Natural Bridge

A common theme from the various resource area reports focuses on the access roads to the day use area and the Flat (upper massacre site). The undesignated road U31N19 accessing the Flat has several immediate problems. It is a source of sediment into Bridge Gulch, pollutants from automobiles, and a visual impact to the landscape. Further, this road allows easy access to the site by OHV's. The design of 31N20 access road where it intersects 31N19 is unsafe and the road surface is eroding. Further, 31N20 does not get maintained regularly that exacerbates the problems noted above. In addition, due to the remoteness of the site both roads allow uncontrolled partying resulting in garbage and vandalism to the area.

In spite of the adverse resource impacts, there is a need to maintain access to this area. There are the ceremonial needs of the Nor-Rel-Muk Wintu for access to the site, in particular for elders. The unclassified road would provide the best access for mobility-impaired individuals to the site if it were upgraded and properly maintained. We need to maintain access for the general public to allow for the continued enjoyment of this unique geologic feature.

Theme 2 - Day Use Area



Picnic table and fire hearth at Natural Bridge day use area.

The second area of concern is the day use area itself. As discussed in the landscape section, the day use area does not meet guidelines or the land use designation in the LMP for visual and recreational character. The current toilet is dilapidated and a potential source of contamination to Bridge Gulch. There is a scattering of human fecal matter throughout the immediate site that needs to be addressed. We believe this is due in part to the poor condition of the restroom facilities. Additional problems related to the day-use area relate to the picnic area located on fill, garbage throughout the area, and the use of the campground for local parties and the lack of funding available for patrolling the site. There is no interpretive signing for the Bridge or the Massacre event, which describes the natural and human history.

Theme 3 - The Flat



The flat upstream from Natural Bridge where according to historic accounts most of the Nor-Rel-Muk who were located when the massacre took place.

This area of the Natural Bridge massacre event itself holds similar problems also in regards to landscape quality and erosion potential. In addition, both this area and the day use campground are potential vectors for noxious weeds being introduced to Natural Bridge. Although the non-system road access to this site does not affect riparian areas it is not regularly maintained and poses other issues related to dispersed camping and OHV use.

Theme 4 - The Bridge Exterior



This picture shows the exterior of Natural Bridge on its downstream side.

Issues surrounding the limestone feature of Natural Bridge itself are several. First, the issue of climbing on this feature whether using permanently attached hardware or not. Climbing has both positive and negative effects:

- Enjoyment of the physical challenge of the climb; the appreciation of nature.
- Dismay for those who view the Bridge as sacred as a church, and the climbing as an intrusion.
- Safety

Public meetings to date have brought about considerable understanding between the Native American parties and the climbing community on the significance of this feature. The possibility of a voluntary closure has been broached.

The effect of climbing paths on lichens is an impact. The locations of these lichens on the exterior of Natural Bridge need to be looked at in more detail to see if climbing has damaged them. This study should look not only at the exposed climbing routes (walls and overhangs), but those routes people use in scramble climbing.

Theme 5 - The Bridge Interior



The Natural Bridge Cave looking downstream along Bridge Gulch stream.

The various recreation activities also may have possible adverse effects on roosting populations on Townsend's Big Eared bat in particular during the period when young are present.

In this area we need to determine significance of the Natural Bridge Cave in relation to the Cave Act and what are the affects of recreational use within the cave.

Theme 6 - Trails



This photo shows the Forest Service trail that runs from the upstream flat to Natural Bridge.

Related to the erosion issue with roads are the various trails about Natural Bridge. Having these trails more properly maintained and engineered would help reduce any potential erosion problems. The trails within Natural Bridge site have not been mapped.

Theme 7 - Heritage Values



This photo shows rut damage to the flat portion of Natural Bridge where much of the massacre took place.

In keeping with the importance of this site within the Forest LRMP as a prescription XI site, the Forest Service should resubmit another nomination to get this site listed on the National Register of Historic Places.

Further, impacts to the site especially its more sensitive areas such as the flat need to be protected from uncontrolled recreation use (see photo above).

Theme 8 - Vegetation Management



This photo shows a California hazel that could be pruned and burned to enhance its growth for traditional basketry gathering.

Management of vegetation/fuels in the assessment area around Natural Bridge to insure fire intensities and frequency are not severe.

Manage those plants and shrubs that are of traditional Native-American use for foods and crafts within the Assessment Area.

6-0 RECOMMENDATIONS

Reviewing the input from the various specialists and our publics in the synthesis section suggests many recommendations. From this section we will take the various themes identified and match up recommendations from the various resource specialists and our publics to the various themes. All recommendations given here will provide opportunities for any future actions designed to rectify the management problems and resource concerns identified earlier in the assessment. Having these recommendations in place will help the Forest and its partners to seek out funding from Forest Service and external sources to help manage and preserve the historic and natural significance of Natural Bridge.

The following desired future condition and recommendations have been developed into a guide for the Natural Bridge Area to provide opportunities for a diverse suite of user groups that value the experience provided at Natural Bridge. Further analysis and opportunity for public involvement will continue during the NEPA processes for specific projects. Involvement of our partners and interested parties in the implementation and monitoring of projects will be essential to successful management of the site.

Desired Future Condition for the Natural Bridge area;

We want the visitor coming to Natural Bridge to find surrounding this remarkable limestone bridge the type and character of vegetation one would have found here prior to the arrival of Euro-American settlement in Trinity County. From this, we hope to share the peace and beauty that is found at the Bridge today. But, we also want to enlighten the visitor to the terrible story of the massacre long since hidden away by time and nature. Given these divergent elements, we wish to enhance for the public this place as a peaceful retreat for family and friends today and those who come behind us.

In that regard the following recommendations are proposed for restoration of the site:

1. A voluntary closure on rock climbing at Natural Bridge is instituted with the assistance of our partners in the climbing community and the local community. This would be done in deference to the massacre event and respect for the traditional importance Natural Bridge has to the Nor-Rel-Muk. It is also recommended that alternative climbing locations in the immediate area and over the entire South Fork Management Unit be identified. These alternate climbing opportunities would provide alternatives to Natural Bridge. Monitor the effectiveness of this action over time.
2. Remove the current attached climbing gear on Natural Bridge. Consult with the climbers and other specialists about how to do this with the least effect to the feature to return it to a more natural state.
3. Eliminate dispersed camping at Natural Bridge. Camping and campfires by special permit only. This would allow for special ceremonial use, eliminate campfires under the bridge that damage the limestone feature, and discourage use of the spot for parties.

4. Alter day use patterns at Natural Bridge. This recommendation would include:

By closing the eastern access road 31N20 to all wheeled vehicle traffic we would essentially decommission the road to a foot trail. A small parking spot could be constructed at the top of 31N20 on the edge of 31N19 to accommodate one to two vehicles. This trail could then link up to the existing trail that leads to the picnic area.

Rehabilitate the current parking area adjacent to the day use picnic area and toilet. This work would include removing the old toilet, pulling back fill and recontouring the slope, and reestablishing riparian features (physical and vegetative). This work would be consistent with the LMP Standard and Guide: Primitive non-motorized recreation. It would also lessen impacts to the intermittent stream currently affected by the low water crossing and the parking lot.

Create a new parking area ¼ of a mile southwest of Natural Bridge area with trail access to the Bridge. Install a CXT quality toilet to handle day use. Eliminate access to the massacre site with natural looking barriers. Strive for accessible features to assist Nor Rel Muk elders and other Forest visitors. Seek volunteer patrols to help keep the site clean and use within acceptable limits.

Require public groups over 25 to acquire a special use permit in order to protect natural and cultural resources at Natural Bridge. Develop volunteer “interpreters” to assist large groups.
5. The small trails threaded throughout the site have contributed to erosion and vegetation disturbance. Reconstruct primary trails and obliterate the remainder. This would provide safer access, but also directing foot traffic would protect vegetation, soils and hydrology resources. This would be a good opportunity to use local youth and volunteers for assistance.
6. Close the Natural Bridge site to OHV use. Barriers would be installed along 31N19 and at the southern access road. In concert with this would be the issuance of a closure order to OHV use.
7. Develop an interpretive program for Natural Bridge. This program would include signing and interpretation at the site, information disseminated via the Forest web site and brochures and links to partners’ web sites. Develop educational program to use in local schools. This program would utilize partners in the local community whenever possible, groups may include:

Nor-Rel-Muk tribe
Trinity County Office of Education
Trinity County Historical Society
Members of the Local Climbing Community
8. Revise the old National Register Nomination incorporating additional archaeological, historical, and ethnographic information. Submit this revised

- nomination to the Regional Office and the Keeper of the National Register for consideration
9. Start development of a fuel NEPA/plan to mitigate the potential at the Natural Bridge site for wildland fire. This fuels plan would incorporate Native American traditional plant use such as hazel (used in basketry) and oak stands (acorn food use). In addition, where it is appropriate moderate levels of restoration treatments, such as hand or mechanical treatments could be done to return the assessment area to its historical fire regime.
 10. Develop a monitoring plan for sensitive plant and animal species within the Natural Bridge site. This would include:
 - Monitor potential adverse effects to the sensitive Brownie lady's-slipper and Mountain lady's-slipper.*
 - Monitor area for the presence of unwanted plants or noxious weeds.*

Conduct a bat survey to protocol. Monitor Townsend's big-eared bat to determine if certain management actions are needed or not to mitigate adverse effects to this population.

Finally, monitor vegetation on the rock surfaces of Natural Bridge to determine if the adverse effects of climbing and recreation use improve with the voluntary closure.
 11. Undertake an evaluation of the Natural Bridge Cave and other associated cave features in this outcrop under the Cave Protection Act. From this evaluation further management measures, if needed, could be brought forward.

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Glossary

Class I Stream: These are highly significant streams that are perennial or intermittent meeting one or more of the following criteria:

1. Have habitat for large numbers of resident and/or migratory fish for spawning, rearing, or migration.
2. Furnish water locally for domestic or municipal supplies.
3. Have flows large enough to materially influence down-stream water quality.
4. Are characterized by major fishing or other water-oriented recreational uses.
5. Have special classification or designation, such as wild, scenic, or recreation rivers.
6. Have special visual or distinctive landscape features and are classified as variety class A as defined in “National Forest Landscape Management Volume 2” (Agr. Handbook 462).
7. Have habitat for threatened or endangered animal species, or contain plants, which are potential or viable candidates for threatened or endangered classification.
8. Exhibit ethnological, historical, or archaeological evidence that makes them eligible for or are included in the “National Register of Historical Places” (FSM 2361).

Class II Stream: These are significant perennial or intermittent streams or segments thereof, which meet one or more of the following criteria:

1. Are used by moderate numbers of fish for spawning, rearing, or migration.
2. Furnish water locally for industrial or agricultural use.
3. Have enough water flow to exert moderate influence on down stream quality.
4. Are used moderately for fishing and other recreation purposes.
5. Are of moderate visual quality and meet variety class B as defined in “National Forest Landscape Management Volume 2” (Agr. Handbook 462).

Class III Stream: These are moderately significant perennial or intermittent streams, or segments thereof, which meet one or more of the following criteria:

1. Have habitat for few fish for spawning, rearing, or migration.
2. Are rarely used for fishing or other recreational purposes.
3. Have enough water flow to exert minimum influence on down stream water quality.
4. Have relatively low visual quality in the landscape and classified as variety class B as defined in “National Forest Landscape Management Volume 2” (Agr. Handbook 462).

Class IV Stream: These are streams of minor significance. They are intermittent or ephemeral streams or segments thereof, not previously classified.

Condition Class: Condition classes are a function of the degree of departure from historical fire regimes resulting in alterations of key ecosystem components such as species composition, structural stage, stand age, and canopy closure.

Level 2 Roads: Roads designated for high clearance vehicles and speeds of 25 mph or less.

Modification: VQO where management activity may dominate characteristic landscape, but must use naturally established form, line, color, and texture. It should appear as a natural occurrence when viewed in foreground or middle ground.

Maximum Modification: VQO where management activities may dominate the characteristic landscape, but should appear as a natural occurrence when viewed as background.

OHV: Off highway vehicle

Partial Retention: VQO where management activities may be evident, but must remain subordinate to the characteristic landscape.

Preservation: This VQO allows ecological changes only. Management activities, except for very low visual impact recreation facilities are prohibited. This objective applies to Wilderness areas, primitive areas, other special classified areas, areas awaiting classification and some unique management units that do not justify special classification.

Retention: VQO that provides for management activities, which are not visually evident.

Visual Quality Objective (VQO): Refers to degree of acceptable alteration of the characteristic landscape considering physical and sociological factors. (Preservation, Retention, Partial Retention, Modification, Maximum Modification).

Appendix

Hydrology Report

This report was prepared to characterize the water resources and hydrologic processes of the Natural Bridge Heritage Analysis Area. The information in this report is based on a reconnaissance-level investigation of the analysis area; pre-existing knowledge of the site; existing Forest Service data; and consultation with other participants in the analysis process. A field visit was conducted on July 8, 2003.

This report provides an overview of the analysis area; discusses the pertinent management direction for the area; characterizes the important geomorphic features and processes of the area; discusses current and reference conditions as they pertain to watershed values; describes anthropogenic features and activities; and provides a discrete set of recommendations that could be integrated into future management actions.

The USDA Forest Service (Forest Service) has recognized the inherent value of Natural Bridge and has designated several administrative boundaries to address the resource values of the area. Specifically, the Forest Service identified a discrete section of this feature as a Special Interest Area (SIA) in the 1995 Land and Resource Management Plan (LRMP) for the Shasta-Trinity National Forests. The LRMP recommended that the SIA encompass 64 acres. It characterized the site as follows: “Natural Bridge is the largest limestone bridge on the Shasta-Trinity National Forests. Natural Bridge is a limestone formation riddled with caves; it was the site of an 1852 Wintu Indian massacre. The primary activities are rock climbing and picnicking.”

The Forest Service as a culturally significant site has recognized the Natural Bridge Heritage Area for the Nor-Rel-Muk Wintu. The boundary of the Natural Bridge Heritage Area and the SIA are not entirely consistent, although they share common themes. This analysis affords the opportunity to evaluate the SIA and the Heritage Area at a watershed scale so that an integrated set of management recommendations can be developed.

Management Direction - Shasta-Trinity National Forests Land and Resource Management Plan

As discussed above, the analysis area encompasses two distinct units of land: the SIA and the Heritage Area. The central feature of these designations is the limestone outcrop known as Natural Bridge. At least five specific resource elements of the LRMP are relevant to a discussion of watershed values and resources in the Natural Bridge area:

- fisheries
- water
- geology
- recreation
- heritage resources

Additional information on these resource elements is contained in the LRMP and the associated Final Environmental Impact Statement on the LRMP for the Shasta-Trinity

National Forests. The Aquatic Conservation Strategy (ACS) in the LRMP is the foundation for describing the relationship between these resource elements at the watershed scale. The following section reiterates the objectives of the ACS and describes the relationship to the analysis area.

Aquatic Conservation Strategy Objectives

1. Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted.
2. Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas of critical or fulfilling life history requirements of aquatic and riparian-dependent species.
3. Maintain and restore physical integrity of the aquatic system, including shoreline, banks, and bottom configurations.
4. Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.
5. Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.
6. Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.
7. Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.
8. Maintain and restore the species composition and structural diversity of plant communities in riparian areas and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.
9. Maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian species.

Riparian Reserves

There are a number of Riparian Reserve Standards and Guidelines (S&Gs) that are relevant to the natural resources and social uses of the Natural Bridge analysis area. **Table 1** identifies the S&Gs that appear to be applicable to the various activities that occur within the project area.

Table 1 - Applicable Standards and Guidelines

Standards & Guidelines	Roads & Trails	Heritage Resources	Rock Climbing	Day Use
Roads Management				
RF 1	X			
RF 2a	X			
RF 2d	X	X	X	X
RF 2e	X			
RF 3a	X	X	X	X
RF 3b	X	X	X	X
RF 3c	X	X	X	X
RF 4	X	X	X	X
RF 5	X			
RF 7a	X			
RF 7b	X			
RF 7c	X			
Recreation Management				
RM 1	X	X	X	X
RM2		X	X	X
Watershed and Habitat Restoration				
WR 1	X			

In a review of the ACS objectives and applicable S&Gs, it appears that the roads, trails, and recreational facilities may be inconsistent with some aspects of the LRMP.

Beneficial Uses and Water Quality Objectives Within and Downstream of Project Area

The North Coast Regional Water Quality Control Board (NCRWQCB) designated beneficial uses for the South Fork Trinity River in its 1994 Water Quality Control Plan for the North Coast Region in 1994. Within the Upper Hayfork Creek watershed, the following beneficial uses are designated:

- municipal and domestic supply (MUN);
- agricultural supply (AGR);
- groundwater recharge (GWR);
- freshwater replenishment (FRSH);
- water contact recreation 1 and 2 (REC-1 and REC-2);
- commercial and sport fishing (COMM);
- cold freshwater habitat (COLD);

- wildlife habitat (WILD);
- migration of aquatic organisms (MIGR); and
- spawning, reproduction, and/or early development (SPWN).

The Water Quality Control Plan identifies a number of discrete water quality objectives that are applicable to the analysis area. They are:

- general objective (anti-degradation);
- suspended material;
- settleable material;
- oil and grease;
- sediment;
- turbidity;
- pH;
- temperature;
- toxicity; and
- chemical constituents.

These characteristics and pollutants cannot be above a level that would adversely affect human, plant, animal, or aquatic life (NCRWQCB, 1994). As a Water Quality Management Agency (WCMA), the Forest Service must demonstrate that actions approved under the LRMP and subsequent processes to comply with the National Environmental Policy Act (NEPA) will not degrade local and regional water quality (USDA Forest Service, 2000). The primary water quality parameters discussed in this analysis are water temperature and sediment.

Water temperature does not appear to be a limiting factor to beneficial uses within and downstream of the analysis area (personal communication, J. Fitzgerald, 2003). Available temperature monitoring data indicate very little measured difference between upper and lower slope channels, probably because of the dominance of groundwater discharge to low and high order channels.

South Fork Trinity River Sediment Total Maximum Daily Load. In 1994, the South Fork Trinity River watershed was listed as “water quality impaired” as a result of excessive sediment loads under Section 303(d) of the California Clean Water Act (NCRWQCB, 1994). A water quality management plan or Total Maximum Daily Load (TMDL) was developed by the U.S. Environmental Protection Agency (EPA) (1998) to reduce the amount of sediment from hillslopes delivered to the South Fork Trinity River. The TMDL sets sediment load allocations that specify the amount of sediment reduction needed to meet the water quality objectives for sediment.

EPA (1998) stated that excess sediments deposited in the South Fork Trinity River have negatively affected beneficial uses by filling pools and degrading spawning gravels. Significant quantities of sediment are delivered to the South Fork Trinity River when intensive land management activities and large storm events overlap in time. Most notable was the 1964 rain-on-snow flood event. Heavy snow followed by warm air and rain led to large magnitude-flooding at a regional scale. High levels of timber harvest and the 1964 flood combined to produce massive quantities of sediment.

The South Fork Trinity River TMDL for sediment sets measurable instream and hillslope sediment reduction targets used to track water quality conditions. According to the TMDL, the limiting water quality objective within the analysis area is sediment.

Wildlife Report

The Administratively Withdrawn Area encompassing the Natural Bridge assessment area. Section 3, Chapter 4 of the LRMP, (pg 4-45) lists standards and guidelines for Administratively Withdrawn Areas. Management practices emphasized within AWA lands relative to wildlife include Wildlife Habitat Management for non-consumptive species and sensitive animals. In addition, standards and guides also direct that no new roads for Forest Service generated activities are to be constructed in these areas, late seral stage forest stands are to be retained, and that this prescription should be used to help provide additional habitat and connecting corridors for fisher and marten and to provide additional habitat for goshawk.

Late Seral Habitat

Within the Upper Hayfork Creek watershed, 2906 acres (5% of the watershed) are typed as M4G and 14018 acres (24%) are typed as M3G. These areas typically contain Douglas fir (*Pseudotsuga menziesii*) and ponderosa pine (*Pinus ponderosa*) in the overstory and represent those most likely to contain late successional habitat conditions, more likely so in the M4G areas.

Habitat conditions relevant to wildlife are reviewed below at up to three scales: the 5th field watershed, the “action area,” and the home range for particular species. Documented sightings, survey records, and wildlife habitat relationship (WHR) models indicate over 100 species of wildlife are known to occur or are associated with the habitat/location parameters of the area surrounding Natural Bridge within the Upper Hayfork Creek watershed. Of these, only the following types will be addressed within this analysis: Federal threatened or endangered species, Forest Service sensitive species, management indicator species (MIS), Northwest Forest Plan Survey and Manage species, and neotropical migratory birds.

In compliance with 36 CFR 219.27(a)(6) the LRMP established management direction which, in part, was designed to maintain viable populations of species, including MIS (analyzed as management indicator ‘wildlife assemblages’ in the LRMP Environmental Impact Statement (EIS) (pp. IV-70 through IV-75). The LRMP EIS cites several components of LRMP management direction as mitigators of potential adverse effects on the management indicator wildlife assemblages, thereby contributing to the provision of adequate habitat. Late seral forests, early seral/shrub, snag and down log, riparian and aquatic, hardwood, chaparral, cliff/cave and talus/rock habitats or habitat components are all represented within the Upper Hayfork Creek watershed. Table G-3 (pg G-6, Final EIS LRMP) lists the wildlife species assemblages that are highly associated with these habitats and habitat components on the Shasta-Trinity. Select species are discussed below. Species given further analysis were selected based on known occupancy within the watershed and/or in the Natural Bridge area. Many of the MIS selected are also federally listed and/or Forest Service sensitive species as well and will be addressed concurrently.

Suitable NSO nesting/roosting and foraging habitat has not been manually typed within the Upper Hayfork Creek watershed. Habitat modeling developed for the NSO Baseline, identified 10,527 acres of suitable nesting/roosting/foraging habitat in the watershed. Geographic information system (GIS) vegetation maps were used to further refine suitable habitat acreages presented herein. On federal lands within the watershed, 2,906 acres of 4G stands exist. These are typed as the oldest stands within the watershed, contain large trees and are considered “old growth” stands with regard to management planning. In addition, 14,018 acres of 3G stands (showing many of the characteristics of late successional forests) occur. These forest types and their associated habitat components exist in a pattern of separate stands of up to 2940 acres in size well distributed throughout the watershed. Higher distribution densities do occur in the vicinity of the Chanchelulla wilderness and the associated LSR.

Management indicator species associated with these habitats include the western screech owl (*Otus kennicottii*), black bear (*Ursus americanus*), and big brown bat (*Eptesicus fuscus*). Breeding Bird Survey results for California are inconclusive regarding the western screech owl due to low sample size (Sauer et al 2003). Screech owls have been confirmed from the vicinity and likely occupy suitable habitats within the watershed. Black bear are common in the watershed, with current conditions supporting at least seasonal use of the Natural Bridge area by black bear.

Chaparral:

7,458 acres of FS lands within the watershed are currently typed as chaparral or some type of brush/shrub dominated type, with chamise (*Adenostoma fasciculatum*), buck brush (*Ceanothus cuneatus*), whitethorn (*Ceanothus cordulatus*), and other shrubs. 1,808 acres are in gray pine (*P. sabiniana*), which typically is very open. Also in the Upper Hayfork Creek watershed, 196 acres are dominated by knobcone pine (*P. attenuata*), populated by small diameter trees in stands typically more dense than gray pine. Both gray and knobcone stands support dense, brushy understories. Most of these areas have not burned in recent years, and are largely decadent.

Mule deer are one of the management indicator species recommended for monitoring for this habitat assemblage. The deer using the Upper Hayfork Creek watershed are a subspecies of mule deer, Columbian black-tail deer (*Odocoileus hemionus columbianus*), and include resident and migratory members of the Hayfork Deer herd. Migratory portions of the herd summer in higher elevation areas and migrate downslope into the valleys beginning in October.

Both indirect and direct factors have been identified as contributing to variability of the population of the herd. Primary indirect factors include habitat condition and habitat loss. Habitat condition, specifically decadence of chaparral communities, alters the availability of forage and may result in alterations of use patterns on both winter and summer range (CDFG 1982). Currently, CDFG has identified the decadence of summer range habitats; specifically higher elevation chaparral and openings, as being the single most significant factor in affecting deer numbers for local herds.

The green-tailed towhee (*Pipilo chlorurus*) is the only other management indicator species within this assemblage recommended for monitoring. No presence or population

data within the watershed is available for this species. Breeding Bird Survey data shows a slight increasing trend for this species within California (Sauer et al 2003).

There are no known or suspected peregrine falcon aeries within the Upper Hayfork Creek watershed. Steep, rocky habitat at the heights and size necessary for nesting is very limited within the watershed. The nearest known eyrie is at Barker Creek, approximately 8 miles NW of the planning area, 4 miles from the watershed boundary. But proximity and prey species composition, indicate peregrines are could utilize portions of the watershed for foraging.