

Appendix 3

Cultural Resources Management Protocol

Unlike many other resources, the management of cultural resources on Federal lands is dictated to a large part by Federal laws and regulations, most recently the National Environmental Policy Act, the Federal Lands Policy Management Act, National Historic Preservation Act, the Archaeological Resources Protection Act, the Native American Graves Protection and Repatriation Act, and the Code of Federal Regulations 36 CFR 800 and 43 CFR 8100 (BLM). Because there is little leeway in how these resources are managed and protected, measures outlined or proposed here are presented as common to all Action Alternatives.

Cultural resources are non-renewable resources; that is, any loss or degradation of cultural resources is permanent. It is important that there is not net loss of scientific information regarding cultural resources, and all National Register eligible sites and Archaeological Districts should be managed as to prevent or minimize adverse impacts. Preservation and protection are the primary goals of any Federal cultural resource program.

Chapter 3 of the EIS presents the background information on Cultural Resources within the planning area. Included in that chapter is a brief description of the types of sites found in the planning area and the various forms of impacts by which these sites are affected. Below is a description of the site types felt to be most susceptible to grazing related impacts. Also included in this section is a description of the process by which cultural resources will be analyzed for this EIS, the criteria by which Determinations of Effect will be made, and a proposal for a grazing-related inventory and monitoring program.

Sites and Impacts

Cultural resource concerns regarding grazing and related impacts focus on site type and the potential for effects caused by livestock. Site types felt to be most susceptible to grazing related activities include:

- A. Rock shelters, where cattle tend to congregate for shelter both in hot and cool seasons. These locations often contain complex sites with a variety of features that can include delicate and perishable materials not found in open settings, and very complicated natural and cultural sedimentary stratigraphy. Sites in these locations can suffer from the immediate and cumulative physical impacts of the livestock, increased erosion, trampling and sedimentary churning, and chemical changes in the soils due to the deposition of large amounts of livestock dung and urine.
- B. Sites with standing architecture, including historic and prehistoric sites, and sites with exposed architectural features that may be subject to livestock impacts.

These sites may have architectural features that may suffer from livestock impacts. Standing walls at both historic and prehistoric sites can attract cattle as rubbing areas, resulting in immediate and significant impacts to those structures. Even sites with only a few courses of intact masonry would be included in this category, as any adverse impacts to the intact portions of these walls will result in unacceptable levels of damage.

- C. Open sites in sensitive locations, such as in erosive soils or in areas that tend to concentrate the presence of livestock (such as watering or feed locations, corrals, trails, or salt licks), and those sites with discreet features such as hearths, slab features, soil staining, middens, and other features that are susceptible to trampling from livestock. Sites in erosive sediments suffer from natural weathering impacts that are exacerbated by trampling and vegetation removal by livestock. Features such as middens, hearths, and fire cracked rock (FCR), lithic debitage and artifact concentrations are easily disturbed by trampling, and once disturbed, lose integrity and scientific value. In certain contexts, cumulative impacts due to disturbance and erosion can quickly and irreversibly impact these features, especially in sensitive soils and on slopes. Buried slab features, such as slab-lined hearths, storage features, and pit houses may at first seem impervious to cattle impacts. Observation has shown that, especially with softer sandstones, this is not always the case. Hard sandstone slabs may help to enclose and protect some features, but softer sandstones may weather quickly. As the upper margins of soft sandstone slabs are exposed through erosion and weathering, these slabs can be quickly broken down by exposure to the elements and trampling by livestock. Without the slabs to help protect and define the features, these can then be rapidly lost to additional exposure, erosion, and trampling.

This category does not *exclude* any site based on site type; rather, it excludes sites based on their likelihood of additional adverse impacts. For example, a lithic scatter found on sandy sediments or slopes open to cattle trailing and increased erosion would be included in this category, while a lithic scatter on stable, gravelly sediments with little depth potential, light grazing use, and not prone to increased erosion might not be included in this category.

- D. Rock art sites accessible to livestock, especially those sites located in areas where cattle are likely to congregate. Although vandalism is by far the most important factor concerning impacts to rock art, livestock can adversely impact these sites as well. Instances of both petroglyphs and pictographs suffering from livestock rubbing have been noted within the EIS area, and cases of dung splattering on rock art panels have been documented in the EIS area and noted in nearby areas.

All readily accessible sites are subject to various degrees of grazing related influences, but the above sites are considered to be more easily damaged than most other site types. These conclusions are based on personal observations, reviews of literature, and conversations with other area archaeologists. While site type is important with regards to impacts, location of the sites is also a factor. Observation has shown that sites in the

immediate vicinity of range improvements that focus livestock related activity, including seedings, will suffer more grazing related effects than those sites more removed from range improvements and natural or developed water sources.

Determinations of Effect

Determinations of Effect represent a scientific analysis of the state of an archaeological or historical site in relation to the agents in question or a proposed activity (in this case, grazing and livestock related activities). Identification of factors leading to any Determination of Effect will need to be based on scientific observations and data collection. A Determination of No Effect means that the site is not being or will not be affected. A Determination of No Adverse Effect means that although the site is being or will be affected by the agents, the effect is not detrimental. A Determination of Adverse Effect means that the site is being or will be adversely impacted by the agents in question.

Determinations for previously identified, recorded sites will be based on existing data, at least until such time as the sites can be re-visited and an updated site form prepared (if necessary). Determinations will also need to be applied to cultural resource sites identified in the future as well. Future data will come from research-driven and Section 106 inventories, as well as from an active, ongoing monitoring and management program. Thresholds for making Determinations of Effect follow the description of each category (see below). Determinations for all sites, whether previously documented or newly discovered, will be made on an individual, case-by-case basis.

Determination of No Effect

This class of sites will likely include primarily those sites that are inaccessible to livestock, such as certain rock art panels, those sites on isolated land forms, and those found on very steep or cliff-side or otherwise inaccessible locations. As the vast majority of sites are accessible to livestock, this class of sites will be a small percentage of the whole.

Thresholds: Sites in this category will show no evidence of disturbance by livestock or grazing related activities.

Determination of No Adverse Effect

After more than 100 years of grazing, it would be difficult to find any livestock-accessible site that has not been affected to some degree. However, under specific conditions on some sites the impacts may have reached their most detrimental levels decades before the present. Numbers of livestock were significantly higher prior to 1935 than they are at current levels, indicating that grazing related impacts were probably greater at that time as well and have probably diminished to some degree since that time. This trend has been noted by other archaeologists as well (see for example Popelish 2001).

At stable sites, not prone to erosion (as noted above), additional adverse impacts might not be expected, as modern cattle are probably only re-mixing the upper few centimeters of site sediments that have been previously mixed. Lithic and ceramic artifacts (flakes and sherds) at these sites will eventually become reduced to a minimum size likely to be impacted by trampling, and will probably suffer only a minimal amount of additional damage.

In some cases, the architectural features of a site have been (either through natural forces or through previous livestock use or other impacts) adversely impacted to the point that additional use by livestock will not further damage these features. The structural component of a pueblo site on stable sediments whose walls have been reduced to linear rubble mounds will probably not suffer greatly from additional use by cattle, as the cattle will tend to walk around loose rock rather than over it.

Thresholds: Sites in the Determination of No Adverse Effect category may show indications of past or ongoing use by livestock, but will show no indications that ongoing livestock use is contributing to adverse impacts. Research potential at these sites is not and will not be affected by ongoing grazing activities. However, care must be exercised when assigning sites to this category. It may be difficult to determine if current grazing use is not contributing to ongoing adverse impacts. As noted by Nielson (1991:493), sherds (and presumably other artifacts) will eventually reach a size class that is no longer affected by trampling, but this size class will differ based on variables such as artifact and material type, sediment characteristics, and weight and contact surface of the trampling agent. The No Adverse Effect category should be used with caution and reserved for sites where it is readily apparent that current grazing practices are not adversely affecting the site.

Determination of Adverse Effect

These determinations will be based on observations regarding the site type, condition, ongoing impacts, use by livestock, and compounding factors such as increased erosion, vandalism, and visitation. Mitigation for these sites can include a variety of approaches, as outlined in the following sections.

Thresholds: Factors of site condition and ongoing impacts will need to be considered prior to a Determination of Adverse Effect. An evaluation by archaeologists should focus on key points regarding site integrity. Following are suggestions of thresholds for a Determination of Adverse Effect:

1. Indications of actively ongoing erosion that is caused by, or exacerbated by, livestock use of the site area.
2. Indications of direct impacts due to livestock, where it is apparent that the livestock are impacting portions of the site or features in the site that were not previously impacted by earlier use of the site area by livestock.

3. Indications of direct impacts by livestock, where it is apparent that the levels of adverse impacts are beyond those previously suffered by the site (or portion of the site) and intact areas are now losing integrity and research potential.

Following are detailed explanations of the various mitigation measures (“tools” in our “toolbox”) for cultural resources in relation to the Rangeland Health EIS. Which mitigation option or options are chosen will depend on several factors, including site type, eligibility to the National Register, location, access and use for/by livestock, nearby rangeland improvements, soil type, site condition, and likelihood for continued adverse, grazing related impacts. The tools are presented below in two primary sections, Non-Cultural Tools, and Cultural Tools. Each tool is examined and detailed in regards to grazing and grazing related impacts. These tools may be used singly or in combination to meet the required objectives.

Non-Cultural Tools for Site Protection

Access Restriction: Restriction of livestock access can be used on a variety of scales, from site-specific to larger, more encompassing areas involving sets of sites or certain geographic settings (canyons, plateaus, ridges, etc.). In some settings, such as a rock shelter or overhang, restrictions may be accomplished easily with barriers. Where possible, brush barriers could be utilized. Brush barriers would have the advantages of appearing more natural and would not call attention to the site, and would not generally require much in the way of tools or man-made materials. Where such “natural” barriers could not be used, traditional fencing or other restrictive options may be necessary. For larger area closures, natural barriers would be used if possible, but traditional fencing is the more likely option.

Closures of small, site-specific locations would not cause any substantial loss of land base (and therefore AUMs) to the permittees. Any closures of areas large enough to result in a reduction of AUMs would require a Land Use Plan amendment, and would require consultation with the permittees.

Access restriction should not be viewed as only for site protection, but could play an important part in scientific research as well. Part of the Cultural Resources proposal for this EIS involves scientific research regarding grazing related impacts to cultural sites and landscapes. Closure of certain areas would act as a scientific control compared to areas left open to livestock. This would be an important aspect when considering livestock impacts, both direct (livestock on the sites) and indirect (such as erosion exacerbated by livestock use) as compared to other, non-livestock, related impacts. Restrictions for scientific purposes should be planned to take full advantage of the research potential. Areas with a variety of site types should be considered, but the restricted and open portions of the research areas should be as similar in the geographic and cultural landscapes as possible. This allows the researcher to compare “apples to apples,” not “apples to oranges.”

Changes in Season of Use: It is at first difficult to see how changes of season of use could be used as mitigation for cultural resource site, but the potential of this “tool” should be considered as a possibility. Livestock tend to congregate in sheltered areas, such as alcoves, overhangs, and rock shelters. Part of this behavioral pattern is in response to weather conditions; in the summer, livestock will “shade up” in shelters, in the winter they will move to these shelters for protection from wind, rain, and snow. In either weather extreme, livestock will seek the sheltered areas. Is there a middle ground in the spring and autumn when livestock are not particularly attracted to sheltered locations? Vegetation has a stabilizing effect on sediments and soils. A change in season of use that results in less impacts to vegetation would also increase site stability by lessening erosion.

In wet weather, such as the monsoon season, there is a more abundant water supply in areas that might not usually have available water (such as natural tanks in slick rock areas). Under these conditions livestock may tend to wander further from their traditional water source than they would under normal conditions, entering areas and impacting sites that only rarely see livestock. Under such conditions a seasonal restriction may be all that is needed to protect a whole series of sites.

Certain types of soils and sediments may also be more prone to livestock impacts under specific weather conditions. Soft sediments and clay soils may be much more susceptible to the hoof action of livestock in wet conditions than dry. Sites found in these areas, within these sediment types, would be more open to negative impacts as the sediments themselves become more susceptible. Again, a seasonal restriction may be all that is necessary to protect sites in these settings.

Location of Range Improvements: Livestock are controlled by the use of a whole series of range improvements, such as fence lines, corrals, water sources, salt licks, and drive ways. All of these improvements have the tendency to focus livestock use into certain areas, concentrating the related impacts. When cultural resource sites are found in the vicinity of these improvements, the impacts to these sites go up significantly.

In many cases these impact can be mitigated by movement of the range improvement. Fences can be constructed around, rather than through, sites. Watering troughs can be constructed or moved away from sites, as can be corrals and other improvements. Removing the reason for livestock congregation would have a positive effect on any site in the vicinity.

Livestock congregation at a watering source not only intensifies livestock use of the source area itself, but also increases livestock use of the surrounding area. Glen Canyon NRA data indicate that cattle will tend to stay within a two mile radius of their water source (GCNRA 1999:22), meaning that livestock will impact sites within that two mile radius to a greater degree than outside that area. If a watering source, corral, etc. is found within or proposed for an area of high site density, it may be prudent to move that improvement to an area of lesser site density.

GSENM has the ability to develop accurate maps plotting the location of cultural resource sites. The Monument can also generate maps depicting the areas generally utilized by cattle (more accurate maps of utilization are proposed, see Research, below). Using these two data sets together should provide a tool that could help pre-plan the location of range improvements to minimize the impacts to cultural resources.

Livestock Herding and Driving Techniques: Over the course of the past few decades, herding techniques have changed dramatically. For well over 100 years, the horse was the means of choice, and often the only choice, for the herding, monitoring, and driving of livestock. Even after automobiles became common in rural southern Utah, the lack of roads and suitable automotive trails dictated that, for many tasks, the horse remained the principle means of transportation. With the advent of the off-road motorcycle, and more recently all-terrain vehicles (ATVs), the horse has in many cases taken a back seat to motorized vehicles.

ATVs have been recognized as a serious problem on BLM administered lands. By increasing the accessibility of distant parts of the landscape, they have also increased the accessibility of cultural resource sites on that landscape. ATV related problems are not just one of access, but also relate to the destructive nature of ATV use in roadless areas. Tracks and trails left by ATVs (and wheeled vehicles in general) are linear and continuous in nature, compared to the separate hoof prints left behind by horses. ATV tracks and trails are far more prone to erosion than are horse tracks. In addition, horsemen will detour around low brush, while ATV riders will often destroy vegetation by driving straight through it when possible. ATV use on cultural resource sites has an immediate destructive effect, and increases the overall rate of secondary erosion. Restricting the use of ATVs and similar vehicles where such activities are impacting cultural resource sites would remove a serious threat to these sites.

Changes in Range Management Practices: Practices such as clearing and seeding to increase the forage in a given area eventually have the effect of drawing livestock to these areas. The clearing operations themselves (chaining, “dozer pushes,” etc.) can have immediately disastrous consequences for cultural resource sites. And then as the seeding matures and cattle are drawn to the project area, additional grazing-related impacts to sites in that area will increase. If cultural resource sites were protected during the clearing operations by leaving them in undisturbed tree “islands,” cattle are later drawn to these islands for the shade they provide in an otherwise open setting. The sites are then open to impacts by not just a few cattle wandering by, but by larger numbers of cattle drawn to the very spot designed to protect the site.

Future large-scale range improvement projects such as seedings should be planned in conjunction with cultural resource specialists to insure that cultural resource sites are taken into consideration, and that potential impacts can be mitigated prior to project implementation. In the seeding example noted above, hand-thinning of the remaining tree cover on the cultural resource site to match the surrounding vegetation density would not adversely impact the site, and would leave no reason for livestock to concentrate on that location.

Reduction of AUMs: The amount of impact a cultural resource site suffers from livestock is, for the most part, proportional to the number of livestock on that site at any given time. Reduction of the number of livestock will therefore reduce livestock related impacts. This is not a complete mitigation in that the amount of impacts will go down with the reduction of livestock, but some livestock (source of the impacts) will remain.

Cultural Tools for Site Protection

Inventory: Approximately 3% of the EIS area has been comprehensively surveyed for cultural resources. While some range improvements are included in this 3%, many older improvements and development projects were implemented or established prior to standard cultural resource surveys. Inventory is needed at those actively grazed locations that have never been surveyed, and will be needed at proposed project locations. Certain projects, such as salt licks or watering locations, will tend to concentrate livestock. With such projects inventory should not be limited to the specific development location, but must take into account the effect of livestock concentration in the area surrounding the improvements. Glen Canyon National Recreation Area calls for an inventory area of a 2 mile radius around water development projects (GCNRA 1999:22); the survey area associated with livestock-concentrating projects on BLM administered lands will be decided on a case-by-case basis and take into account terrain, site potential, site types, numbers of livestock, livestock behavior, and type of project.

Additional inventory across the EIS area should be directed at locations or topographic features likely to harbor site types known to be at risk from livestock, locations that tend to attract livestock, and areas of known or suspected high site density. Larger areas that have seen little or no inventory but that are used for a significant amount of grazing should also be surveyed to identify at-risk sites as well as to establish the cultural resource character of the area.

Detailed Site Recording and Collection: Cultural resource sites are generally documented by recording certain data on specially prepared forms, the “site forms.” Many factors can influence what kind of, and the amount of, information that makes it onto a site form. Early site forms often lacked many categories that are today are considered required information. An example of this would be impacts to sites. Most site forms from 30 or 40 years ago did not even include a category or space for noting specific site impacts, and instead may have had only a check box for site condition, “Good,” “Fair,” or “Poor.” The rare comments on specific impacts, if any, would be added in the narrative portion of the site form, and these narratives themselves were often not as detailed as modern procedures require.

In some specific cases, detailed recording or re-recording of a site may be all that is necessary for mitigation. Sites that have been heavily impacted in the past and retain little integrity, for example, may be adequately documented by a thorough recording process and artifact collection and curation. Recording and collection as mitigation

should be reserved for sites where it is apparent that these actions alone will retrieve any scientific information left at that site.

At the very least, detailed recording should be seen as the beginning the documentation process. It is a requirement prior to any collection, testing, or full excavation (see below). And if any reasonable form of scientific monitoring is to be accomplished, a detailed record of the site before the monitoring process begins is a must. Only then can changes in site condition, artifact counts and dispersal patterns, and future impacts be accurately tracked.

Archaeological Testing and Excavation: Archaeological testing of a site refers to test excavations to determine a site's character, depth, cultural affiliation, and eligibility to the National Register. Test excavations are usually restricted in scope and nature, and involve a small number of small test plots or trenches. Testing can provide a host of information without the destruction and cost involved in larger scale excavations, and can often provide the level of information needed to make informed decisions regarding management direction for that site. Testing (and also excavation, see below) can often provide information not just about that specific site, but about other nearby sites in similar settings and apparent cultural affiliation. Thus the testing of one site may provide insight to the management needs of numerous sites. While testing, like excavation, is a destructive process, testing is performed on a scale small enough that the overall integrity of the site is not impaired.

Excavation of cultural resource sites is a destructive process, and once a site has been excavated it cannot be re-assembled and protected. Excavation is generally used in situations where the site is in imminent danger of destruction and some form of data retrieval is necessary, or in situations where important scientific research questions cannot be answered by other, non-destructive means. As a mitigative tool, excavation should be considered a last resort. Excavation can provide a host of scientific information that cannot be had otherwise, but excavation is costly, can be time consuming, and results in the loss of some or all of the cultural resource site. Excavation may well be the only suitable form of mitigation at sites that have been so heavily impacted that other mitigation forms do not seem applicable.

Monitoring: Monitoring is a necessary component of any cultural resource program. Federal archaeologists have in place existing monitoring programs, but these are generally either site-specific, or performed on an as-needed or when-possible basis, and respond to a variety of projects and impacts. This EIS project highlights the need for a more comprehensive inventory and monitoring program designed to identify, quantify, asses, and monitor impacts to cultural resource sites based on livestock use and related factors.

Base line data on the condition of sites is generally collected at the time the site is recorded. However, many older site forms did not adequately address impacts to the sites, and grazing impacts were not always recognized or given much weight among the list of site impacts. Within the past two or three decades this has begun to change as

archaeologists gain a broader understanding of the nature of various impacts, especially those related to grazing. Monitoring will provide base line data where necessary, and will allow tracking of resource condition over time. Monitoring is also included as part of the proposed research component (see below).

As various mitigating measures are proposed and implemented, research monitoring will track the effectiveness of these measures allowing managers to make informed decisions regarding cultural resources.

Research: A major focus of cultural resources and this EIS is a research component directed at a better understanding of grazing related impacts to cultural resources, and the effectiveness of various mitigating measures. A fair amount of research has been accomplished over the past couple of decades into grazing related impacts to cultural resources, but most of these studies have been relatively small in nature and relatively short term. The research proposed here will be of greater scope, covering many site types in a variety of geomorphological settings and soil types. This is proposed as a long term project, to be initiated with the finalization of the EIS and carried through until definitive statements can be made regarding grazing related impacts and cultural resources. This is an ambitious proposal that will result in the most comprehensive study of its kind to date.

Another phase of this proposed research will involve the foraging behavior of cattle. As noted above, there is some indication that cattle will tend to stay within two miles of a water source (GCNRA 1999:22). However, this “sphere of influence” is probably dependent on a series of factors, including variables such as terrain, forage, and weather. This EIS provides the chance to pursue an avenue of research that perhaps has not been addressed before-- the actual movement of cattle across the landscape. By placing GPS tracking devices on cattle, their movements in specific types of terrain and under specific conditions could be tracked. This information would be valuable in predicting livestock movement in relation to cultural resource sites, and would be an important management tool. This proposal should be seriously considered in the research portion of this document.

A third component of this research consists of a cultural resource inventory and monitoring plan directly related to range uses and improvements and will become part of the overall range management program. To date, only about 3% of the EIS area has been comprehensively inventoried for cultural resources. Although this means that certain areas can be well characterized as to their cultural resources, it also leaves vast blank spots on the maps. The generation of detailed livestock utilization maps (see above) can help determine what areas see heavy grazing use, but have seen little or no cultural resource inventory. Future inventory projects could then be focused on areas that would provide the “most bang for the buck.”

While inventory provides a first look and recording episode for cultural resource sites, monitoring provides the basic information by which changes to the site can be measured. This portion of the monitoring program will be a research component directed at identifying and investigating the specific agents of livestock related impacts at

archaeological and historic sites (for example: direct impacts from livestock, erosion associated with livestock use, impacts from development of range projects, impacts from maintenance of range improvements, and impacts related to increased accessibility/visitation resulting from range improvements). This will be required to track changes in site condition.

Monitoring will also be necessary to track the effectiveness of different mitigative measures applied to various cultural resource sites, so that management can make more informed decisions in the future as to what forms of mitigation may better apply to various site types. Specific forms will be developed for the monitoring of these sites, detailing information such as what kinds of impacts are present; for example, apparent amount of livestock use (as seen by trailing, cow dung, ground disturbance, etc.), linear meters of stock trails that appear on the site, size and location of areas impacted by livestock, changes in numbers and types of features and artifacts visible, the condition of these features and artifacts.

While inventory and monitoring are not mitigating measures in themselves, they are a vital part of an overall mitigation plan.

A final portion of this research program is the continuation of the collection of local oral histories. Interviews conducted with long-time area residents can address the history of the ranching and livestock industry in the EIS area, and can help describe range conditions and how they have changed over the past several decades. Also included here might be an ethnographic study concerning the local ranching life style; this may be particularly important in that the ranching life style of the past few decades is quickly becoming a thing of the past.

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