

4.3. CULTURAL RESOURCES

Impacts to the cultural resources of the VPA would primarily result from activities associated with surface and subsurface disturbance such as development projects, recreational use/OHV travel, and fire management. Impacts may, however, result from specific cultural resource management decisions and from non-surface-disturbing activities that create visual and/or auditory effects. These latter impacts would apply primarily to sites or locations deemed sacred or traditionally important by Native American tribes and used by these groups in such a manner that visual obstructions and/or noise levels impinge upon that use.

Because the majority of cultural resources that have been identified in scoping consist of archaeological sites, the primary concern for negative impacts relates to disturbance of the artifacts, features, architecture of sites in ways that reduces their integrity, alters their association with traditional values, and reduces the potential to recover data. Archaeological data consist of both "objects" (in the broad sense of artifacts, architecture, features, etc.), and the horizontal and vertical relationships between these objects. Our ability to interpret and understand the past is based on recovering not only the material culture of the past in the form of artifacts, buildings, and the built environment but the spatial relationships between different aspects of material culture. Thus, surface and subsurface disturbances, which not only destroy material culture but also destroy the spatial relationships that are key to interpreting that culture, have the greatest potential for negative impacts on cultural resources. Impacts can include elimination or reduction of the setting and physical integrity of a sacred or other site, including National Register-eligible sites, landscapes and cultural theme areas, disruption or reduction of the religious values of sites and areas, reduction in the data potential of a site, and damage to traditional collection areas or resource sites. In general, impacts on cultural resources from surface disturbance are long-term in nature; once an archaeological site has been impacted, the affect typically cannot be reversed. Short-term effects from visual or auditory impacts may occur, however, and can often be ameliorated or accommodated.

Potential impacts to cultural resources from the Proposed RMP and the various proposed management alternatives are difficult to quantify precisely. The management plan neither stipulates precise areas for surface-disturbing activities nor are the precise locations of all resources in the zone known. However, it is possible to estimate impacts based on the proposed general locations of activities and the relationships of these planning areas to zones of higher and lower probability for cultural resources. As discussed in Chapter 3, a geographical model of high and low cultural resource site probability has been built utilizing proximity to water, sand dunes, pinyon-juniper zones, historical mining districts, and slope. All areas within approximately 1 km of permanent water, or within pinyon-juniper vegetation zones, or within areas of sand dunes, or within the general area of historical mining districts were considered high site probability zones (encompassing approximately 2.7 million acres over the entire region, with about 708,000 acres within BLM lands). Areas with greater than 30% slope, or not having any of the high site probability factors were considered low site probability zones (encompassing approximately 2.8 million acres, with about 1.2 million acres within BLM lands). Planning areas and actions in the following sections are therefore assessed with regard to how much of the Proposed RMP is likely to result in surface-disturbing activities within these zones. While not precise, this method enables a quantifiable assessment of probable relative effect(s) of planning actions.

Furthermore, in a number of cases, it is also possible to estimate the number of sites that would become either identified or involved in particular types of proposed actions. Class II cultural resource inventories in the Vernal area during the 1970s identified the average number of sites per square mile in zones of high and low cultural resource sites (see Spangler 1995:228-240). These ranged from estimates of 0.13 sites/square mile in low site occurrence zones in the Red Wash II survey area (Spangler 1995:233) to 6.5 sites/square mile in high site probability areas in the Seep Ridge survey area (Spangler 1995:236). A conservative average of these surveys results in an estimation of 4.87 sites/square mile in high site probability zones and 0.93 sites/square mile in low site probability areas. For estimating sites along linear projects crossing small portions of these zones, the midpoint between these ranges of 2.9 sites/square mile is used. It must be stressed that the estimates are based on averages of results from different surveys, are based on a number of assumptions, and are therefore best considered a means of gauging relative impacts under the Proposed RMP and each alternative. They should be considered a means of determining the order of magnitude for numbers of sites involved, rather than precise estimates of known numbers of sites.

Impacts on cultural resources may be indirect and negligible from the Proposed RMP or alternative decisions related to forage management, air quality, hazardous materials, livestock grazing, riparian area management, soils and watershed management, special status species management, visual resource management, and wild horse and wildlife management as they do not prescribe specific actions that increase or decrease conditions that directly affect ground disturbance—a key consideration in impacts on cultural resources—or secondary affects from increased human presence. As such, those actions, determined by the BLM IDT through best professional judgment as having little or no potential for impacts on cultural resources, will not be considered further in this analysis. All other alternative and the Proposed RMP decisions with the potential to impact cultural resources either positively or negatively in a significant way are discussed below.

4.3.1. IMPACTS COMMON TO THE PROPOSED RMP AND ALL ALTERNATIVES

The Proposed RMP and all alternatives will comply with federal laws and agency guidelines governing the identification, evaluation, and protection of cultural resources and Native American sacred/traditional sites and trust assets, including, but not limited to, the National Historic Preservation Act (NHPA), the Archaeological Resources Protection Act (ARPA), the Native American Graves Protection and Repatriation Act (NAGPRA), the American Indian Religious Freedom Act (AIRFA), and Executive Orders 13175 and 13007. All undertakings under the Proposed RMP and all alternatives are subject to compliance with Section 106 of the NHPA, which mandates the consideration of avoidance or mitigation of adverse impacts on cultural resources or traditional cultural places that are either listed on or have been determined eligible for the National Register of Historic Places (NRHP). The BLM has forwarded to the Utah State Historic Preservation Office (SHPO) a determination that, although in some cases, management actions in this plan may have a potential to affect historic properties, there would be no adverse affect to these historic properties. Appendix P is SHPO's concurrence with the BLM's determination of no adverse affect to historic properties.

Additionally, under the Proposed RMP and all alternatives, the BLM will monitor overall environmental and resource health and will adjust land uses according to the prescriptions set forth in the RMP to provide for healthy and stable resource conditions.

In general, actions common to the Proposed RMP and all alternatives are philosophical or procedural in nature and do not include specific actions for which impacts on cultural resources can be assessed. However, some decisions crossing the Proposed RMP and all alternatives are specific enough to identify potential impacts from them on cultural resources. The effect of non-cultural resource related management decisions common to the Proposed RMP and all action alternatives on cultural resources can be categorized as those having a potential direct effect and those having a potential indirect effect. Management decisions common to the Proposed RMP and all alternatives that allow for surface and subsurface disturbance, such as securing abandoned mines (many of which are historic), and using chemical, mechanical, and prescription fire treatments to manage the effects of wildland fire. Owing to insufficient data related to the very small percentage of the VPA that has been inventoried for cultural resources, the exact impact of such decisions on specific cultural resources cannot be quantified. Adverse impacts from such activities can be avoided or mitigated through adherence to the Section 106 process of the NHPA.

Although it is not possible to precisely estimate the impacts of the decision, motorized camping vehicles would be allowed to travel off designated routes on a single path up to 300 feet to access an existing disturbed dispersed camp site, except in non-WSA lands with wilderness characteristics and WSA lands. In designated travel route areas, an activity level plan would be used to identify areas suitable for camping that would allow motorized vehicles to travel from those designated routes. The BLM would monitor dispersed camping activities and would work with user groups to address adverse environmental conditions if warranted. If use is such that undue environmental impacts are taking place, the BLM would close and rehabilitate damaged areas. If monitoring indicates that developed camping is needed, the BLM would evaluate the viability of developed campsites.

The results of this analysis are provided in detail in Section 4.3.2.8, as they are directly related to travel decisions along these routes. In summary, the analysis suggests that although the action would leave an indeterminate number of cultural resource sites potentially subject to continued impacts or new impacts, because the number of open routes would be reduced under the Proposed RMP and all alternatives except Alternative D (No Action) (i.e., Proposed RMP and Alternatives A, B, C, and E), the number of sites potentially subject to continued or new impacts would be reduced unless the no-action alternative is selected. Because a large number of routes are open at the present time, and therefore impacts may be presently occurring, reducing the number of open routes reduces the potential for new or ongoing disturbance to cultural resource sites, and therefore this prescription is generally beneficial to cultural resources. Monitoring of impacts from the guideline should help to reduce continuing or new impacts further.

Conversely, many common management decisions have direct positive impacts on cultural resources. In particular, the decision to treat vegetation around important archaeological sites so as to reduce the probability and severity of wildland fire impacts on sites provides a direct positive benefit to the subject archaeological sites by helping to protect those values that render

them significant. Other types of management decisions have potential indirect impacts on cultural resources. For example, management decisions that call for enforcing land use permits to insure no incidental surface and subsurface disturbance, maintaining appropriate grazing/forage AUMs to insure stable vegetation cover thereby reducing erosion, requiring dispersed camping, or limiting activities in areas of biological soil crusts or special designations, provides an indirect benefit to cultural resources by reducing surface and subsurface disturbance and placing tighter controls on some land uses.

Understandably, the actions common to the Proposed RMP and all alternatives that have the greatest direct impact on cultural resources are those related specifically to said resources. The cultural resource decisions common to the Proposed RMP and all alternatives are designed to follow federal law and agency guidelines and to protect the values of cultural resources that make them important, whether these are public values, scientific values, conservation values, experimental values, or traditional values. As such, these decisions common to the Proposed RMP and all alternatives would be made within a decision-making environment that requires balanced stewardship of cultural resources within the VPA. In particular, these decisions must consider human burials and associated burial goods under both the NAGPRA and the ARPA. The decisions also insure adherence to the Section 106 process of the NHPA for all BLM authorizations of land and resource use and codify the importance of appropriate levels of consultation and interaction with Native American tribal groups to assure that the concerns of indigenous peoples are addressed and their rights protected as the BLM makes management decisions.

Special designations, such as ACECs, WSAs, and Wild and Scenic Rivers, common to the Proposed RMP and all alternatives should also afford indirect benefit to cultural resources through the restriction, in some cases, of surface disturbances as part of the designation. Seven existing ACECs in the region, Browns Park, Nine Mile Canyon, Red Mountain-Dry Fork, Red Creek Watershed, Pariette Wetlands, the Lower Green River Corridor, and Lears Canyon, would be maintained under the Proposed RMP and all alternatives. Some of the alternatives have expanded ACECs, however the Proposed RMP does not. The ACEC designation will provide some protection through additional management prescriptions. Furthermore, the Pariette Wetlands and Lears Canyon ACECs will be managed as NSO and closed to mineral material disposal, which should also reduce potential impacts to cultural resources. The Pelican Lake SRMA is designated NSO under the Proposed RMP and all alternatives, which should afford protection to cultural resources. Wild and Scenic River designations, such as the existing Upper and Lower Green River designations, also offer indirect benefit as these areas are managed as NSO 0.25 mile from the high water line of the river as per the Wild and Scenic Rivers Act.

4.3.2. PROPOSED RMP AND ALTERNATIVE IMPACTS

Proposed actions under the Proposed RMP and each alternative have the potential for different degrees and kinds of impacts on cultural resources within the VPA. It must be remembered, however, that regardless of the level of potential impacts under a given alternative or the Proposed RMP, decisions with the potential to impact cultural resources that would require further permitting or analysis, such as permitting particular oil and gas operations, developing rangeland improvements such as guzzlers or fences, conducting a prescribed burn, or developing

a campground are subject to the Section 106 process of the NHPA before they can be authorized. As part of this process, if it is determined that there are any known or potential impacts to cultural resources that are either listed on or have been determined eligible for listing on the NRHP, alternatives must be developed that would avoid, minimize, or mitigate adverse effects on historic properties. Because of these protective measures, over management of the area in the past there have been minimal negative impacts to cultural resources. It is frequently possible to identify resources in advance and either avoid these resources or develop mitigation strategies to reduce the negative impact to the resource.

4.3.2.1. IMPACTS OF CULTURAL RESOURCE DECISIONS ON CULTURAL RESOURCES

Cultural resource decisions under the Proposed RMP and the various alternatives include direct site protection and interpretation measures. Cultural resource decisions include provisions for establishing on- and off-site interpretive facilities at appropriate cultural resource sites in a manner that does not adversely impact the resource. Sites selected for interpretation would be ranked higher in public use values than in other site values such as scientific, conservation, or experimental values. Sites with high traditional values to Native American tribes would not be designated for interpretation unless tribal approval was granted. Decisions to provide interpretive facilities both on- and off-site have generally positive short-term effects on cultural resources within the VPA. Through interpretation, the public can be educated about the value of cultural resource sites and the necessity to refrain from damaging them.

Indirect effects to cultural resources from cultural resource decisions under many alternatives are limited. In the short-term, limiting OHV travel to designated routes in areas of high site density may encourage OHV users to move their activities to other areas. Additionally, limiting OHV travel to designated routes may increase traffic along the designated routes and indirectly impact resources. As such a small percentage of the VPA has been inventoried for cultural resource sites, it may not be possible to proactively assess the potential impact on cultural resources resulting from shifts in location of OHV activity in light of travel restrictions in some areas.

Indirect impacts may also result from decisions to provide on- and off-site interpretive facilities. Increasing the awareness of the public that cultural resources are present in a given area would encourage some land users to intentionally seek out cultural resource sites for exploration and looting. Such incidental impacts are, however, expected to be quite limited.

4.3.2.1.1. PROPOSED RMP

Cultural resource decisions under the Proposed RMP would limit OHV travel to designated routes in areas of high cultural resource site density such as the Uinta Foothills (33,059 acres), Little/Devils Hole (10,878 acres), Upper Willow Creek (4,304 acres), and Four Mile Wash (ca. 560 acres). Such OHV travel prescriptions would reduce potential impacts to cultural resources as compared to the current management situation by reducing the frequency of OHV use as well as the intensity of surface disturbance related to OHV use. Additionally, OHV travel prescriptions should reduce the number of cultural resource sites that are exposed to OHV use overall. Oil and gas leasing would still be allowable in these areas under the Proposed RMP.

Other cultural resource decisions under the Proposed RMP include provisions for establishing on- and off-site interpretive facilities at appropriate cultural resource sites in a manner that does not adversely impact the resource.

4.3.2.1.2. ALTERNATIVE A

Cultural resource decisions under Alternative A would limit OHV travel to designated routes in areas of high cultural resource site density such as the Uinta Foothills (33,059 acres), Little/Devils Hole (10,878 acres), Upper Willow Creek (4,304 acres), and Four Mile Wash (ca. 560 acres). Such OHV travel prescriptions would reduce potential impacts to cultural resources as compared to the current management situation by reducing the frequency of OHV use as well as the intensity of surface disturbance related to OHV use. Additionally, OHV travel prescriptions should reduce the number of cultural resource sites that are exposed to OHV use overall. Oil and gas leasing would still be allowable in these areas under Alternative A.

Other cultural resource decisions under Alternative A include provisions for establishing on- and off-site interpretive facilities at appropriate cultural resource sites in a manner that does not adversely impact the resource.

4.3.2.1.3. ALTERNATIVE B

Direct positive impacts to cultural resources resulting from cultural resource decisions under Alternative B are similar to those described for the Proposed RMP, however, the magnitude of their impact is reduced for some decisions. Under Alternative B, on- and off-site interpretive facilities would still be developed, but they would only be established as part of mitigation of impacts for authorized or permitted activities; implementation of interpretive programs would not be proactive or independent of mitigation.

Decisions on the restriction of OHV travel to designated routes in areas of high cultural resource site density are identical to those described for the Proposed RMP.

4.3.2.1.4. ALTERNATIVE C

Cultural resource decisions under Alternative C are similar to those under the Proposed RMP and would have a higher direct positive impact on cultural resources within the VPA than under any alternative. Cultural resource decisions under Alternative C would eliminate both oil and gas leasing and OHV travel in the areas of high cultural resource site density noted previously. The other action alternatives permit oil and gas leasing in these areas but restrict OHV travel to designated routes. The closure of these areas would significantly reduce potential and ongoing impacts to cultural resources as compared to the current management situation and other action alternatives by substantially reducing levels and frequencies of surface disturbance.

Under Alternative C, on- and off-site interpretive facilities would be established at all appropriate cultural resource sites in a manner that does not adversely impact the resource. Such interpretive facilities would be established proactively and independent of mitigation for authorized or permitted undertakings. Sites with high traditional values to Native American tribes still would not be designated for interpretation unless tribal approval was granted.

4.3.2.1.5. ALTERNATIVE D (NO ACTION)

Under the current management situation, the four identified high cultural resource site density areas (Uinta Foothills, Little/Devils Hole, Upper Willow Creek, and Four Mile Wash) would be open to oil and gas leasing with standard lease stipulations and OHV travel. Such a situation increases the possibility, over other alternatives, that important cultural resource sites would be damaged or destroyed by surface disturbance.

Under the current management situation, interpretive facilities would be developed at the Old Rock Saloon site and Nine Mile Canyon area. Further, a self-guided tour of important structures and locations in the Browns Park area would be implemented. The direct impact of such interpretive facilities on educating the public about good site stewardship would be similar to that described under the Proposed RMP but would be somewhat reduced in scope as fewer facilities would be developed.

4.3.2.1.6. ALTERNATIVE E

The impacts on cultural resources would be similar to those discussed under Alternative C because the proposed decisions are the same.

4.3.2.1.7. SUMMARY OF CULTURAL RESOURCE DECISIONS

Overall, Alternatives C and E would provide the greatest benefit to cultural resources by eliminating oil and gas development and OHV travel in specific areas of high site density, and by establishing interpretive facilities at the greatest number of locales. The Proposed RMP would provide less benefit because oil and gas development would continue to be allowed in areas of high site density. Alternatives B and D would provide the least benefit to cultural resources because fewer restrictions would be placed on minerals development and OHV travel.

4.3.2.2. IMPACTS OF FIRE MANAGEMENT DECISIONS ON CULTURAL RESOURCES

Fire management decisions would primarily have direct and indirect effects that vary in kind over the short- and long-term. Depending on the flame height, temperature, and duration of fires, prescribed burns as well as associated pre-burn vegetation treatments and post-burn rehabilitation activities can have a negative impact on cultural resources by damaging or destroying combustible artifacts and features, damaging artifacts, features, rock art, aspen art, and sites through surface disturbance, altering the provenience of artifacts through surface disturbance, and altering the accuracy of scientific tests (e.g., radiocarbon, obsidian hydration, and residue analysis). These direct effects are the same over both the short- and long-terms. Furthermore, once denuded by prescribed fire, there may be additional negative impacts to cultural resources in the short-term due to increased erosion on archaeological sites, which can displace artifacts and reduce their interpretive value. Increased visibility of archaeological sites can also result in increased looting or artifact collection, which reduces the scientific value of the resource.

However, because prescribed fires often occur at a lower temperature than wildfires, prescribed fires are likely to result in less damage to cultural resources than would wildfires over the same area. Furthermore, all prescribed fire and associated activities with the potential to negatively impact cultural resources are also, subject to review and approval under Section 106 of the NHPA prior to implementation. Such review and approval requires the identification of NRHP listed and eligible cultural resources within the treatment area, evaluation of those resources for the NRHP, development of avoidance and/or mitigation protocols to ameliorate potential adverse impacts, and consultation with potentially effected Native American tribes. Such protections are not in place in the case of wildfires. Thus, overall, prescribed fires tend to have a greater positive benefit to cultural resources than wildfires, though they do involve limited negative impacts.

Reduction of surface cover through prescribed fire can also have a positive impact on knowledge of cultural resources within a given area by exposing previously unidentified cultural resource sites that were obscured by vegetation. The exposure of such sites allows for increased knowledge regarding the overall archaeological record of the VPA and the more thorough identification of prehistoric and historic land-use patterns. Thus, over the short-term, direct, and indirect effects can include destruction of artifacts and other cultural resources by fire, and erosion can also occur. However, over the long-term, the reduction in intensity of fires combined with the increased knowledge of cultural resources that would occur as a result of surveys conducted prior to fires and increasing site visibility after fires would result in an increased benefit to cultural resources.

Under the current management situation, Alternative D (No Action), 27,950 acres in the Book Cliffs RMP and 22,950 acres in the Diamond Mountain RMP would be treated with prescribed fire and related activities for a total of 50,900 acres. Under the Proposed RMP and Alternatives A, B, C, and E prescribed fire would be allowed on approximately 156,425 acres per decade. Because a far greater number of acres are proposed for prescribed fire under the Proposed RMP and Alternatives A, B, C, and E relative to Alternative D (No Action), all of these alternatives are likely to have greater positive direct impacts on cultural resources and reduced negative direct impacts relative to the current management situation.

4.3.2.3. IMPACTS OF LANDS AND REALTY DECISIONS ON CULTURAL RESOURCES

Land and realty decisions involve decisions to acquire and manage various lands and resources. For the most part, the lands and resources involved are currently managed under the same federal laws that apply to the BLM and effects are likely to be minimal. Variations between the alternatives primarily relate to the specific aspects of the proposed actions, and impacts are likely to be indirect and long-term rather than direct or short-term.

4.3.2.3.1. PROPOSED RMP

Under the Proposed RMP, the BLM could pursue an easement for the old Uintah Railroad bed from the Utah/Colorado line to Watson in Evacuation Wash. The old Uintah Railroad bed is a known and documented historical cultural site. There are likely to be long-term beneficial indirect impacts, as withdrawing lands from mineral development would reduce negative impacts over the area. Furthermore, the acquisition of the Uintah Railroad corridor by the BLM and the

management of this historical site in accordance with federal law and agency guidelines would afford some protection to this specific site by reducing potential negative impacts to it from private actions not subject to the same laws and guidelines. The BLM would pursue the acquisition of Indian trust lands near the confluence of South and Sweetwater Canyons and in the Bitter Creek area and would pursue public access at the mouth of Cowboy Canyon, Bonanza Bridge, and Wagon Hound Road. Because these lands are currently managed under the same federal laws that apply to the BLM, there are likely to be minimal changes from the current action in how cultural resource sites are protected or impacted.

Additionally, under the Proposed RMP, the BLM would pursue a locatable mineral withdrawal or other protective measures that would preclude mineral entry in the Green River Scenic Corridor in Browns Park (8,208 acres), the Lears Canyon relict vegetation area (1,375 acres), the White River area non-WSA lands with wilderness characteristics (6,720 acres), the White River SRMA (1,110 acres), developed and potential recreation sites (5,000 acres), and the Book Cliffs Natural Area (401 acres). These actions would have a long-term indirect positive impact on cultural resources within the VPA by reducing the number of cultural resource sites that are subject to mineral development. The effect of withdrawal of lands from mineral entry under the 1872 mining law as amended is a decrease in overall surface and subsurface disturbance within the withdrawn area. As the extent of surface and subsurface disturbance is the single greatest factor in predicting the potential for adverse impacts to cultural resources, an overall reduction in surface and subsurface disturbance through a mineral entry withdrawal would presumably reduce the overall potential negative impact to cultural resources. Compared to Alternative D (No Action), this would provide less protection because fewer acres would be withdrawn and because Alternative D (No Action) would withdraw lands for both agricultural and mineral entry.

4.3.2.3.2. ALTERNATIVE A

Under Alternative A, the BLM would pursue the acquisition of Indian trust lands near the confluence of South and Sweetwater Canyons and in the Bitter Creek area and would pursue public access at the mouth of Cowboy Canyon, Bonanza Bridge, and Wagon Hound Road. Because these lands are currently managed under the same federal laws that apply to the BLM, there are likely to be minimal changes from the current action in how cultural resource sites are protected or impacted.

Additionally, under Alternative A, the BLM would pursue a locatable mineral withdrawal or other protective measures that would preclude mineral entry in the same areas as described for the Proposed RMP. As such, the impacts under Alternative A from these decisions would be the same as those described for the Proposed RMP.

4.3.2.3.3. ALTERNATIVE B

Under Alternative B, the BLM would pursue only administrative access to Indian trust lands and would not pursue public access to the White River at the mouth of Cowboy Canyon, Bonanza Bridge, and Wagon Hound Road. Any administrative actions that would be considered federal actions would be subject to NHPA and other laws. Furthermore, land use decisions would have

to be coordinated with the Bureau of Indian Affairs, Native American tribes, and other landowners.

Additionally, under Alternative B, the BLM would pursue a locatable mineral withdrawal or other protective measures that would preclude mineral entry in the same areas as listed under the Proposed RMP. Impacts of these actions would be the same as the Proposed RMP.

4.3.2.3.4. ALTERNATIVE C

Lands and realty decisions under Alternative C are identical to the Proposed RMP, with impacts similar to those discussed under the Proposed RMP, except that the BLM would pursue an easement for the old Uintah Railroad bed from the Utah/Colorado line to Watson in Evacuation Wash and locatable mineral withdrawals would be pursued in the proposed Lower Green River ACEC (17,063 acres) and White River ACEC (9,218 acres).

The impacts would be the same as described under the Proposed RMP, except that an additional 13,500 acres would be subject to locatable mineral withdrawal or other protective measures that would preclude mineral entry. Compared to Alternative D (No Action), this would provide similar protection because only 365 more acres would be withdrawn.

4.3.2.3.5. ALTERNATIVE D (NO ACTION)

Lands and realty decisions under Alternative D (No Action) include locatable mineral withdrawal or other protective measures that would preclude mineral and agricultural entry on the Green River Scenic Corridor in Browns Park (19,400 acres), the relict vegetation areas (3,600 acres), the lower Green River ACEC (7,900 acres), and developed and potential recreation sites (5,000 acres). These withdrawals would afford protection to cultural resources in these areas by limiting surface disturbance. Overall, this alternative provides for approximately 13,000 more acres of land withdrawal than the Proposed RMP and Alternatives A and B, and 365 fewer acres than Alternatives C and E.

4.3.2.3.6. ALTERNATIVE E

The impacts would be similar to those discussed under Alternative C because the decisions are the same, except that approximately 277,596 acres of non-WSA lands with wilderness characteristics would be excluded from rights-of-way (ROW) designation. This decision would have long-term, beneficial impacts on cultural resources because these areas would be protected from the surface disturbances associated with ROWs (e.g., utility, oil, and gas transmission line corridors).

4.3.2.3.7. SUMMARY OF LAND AND REALTY DECISIONS

In summary, relative to unspecified decisions under the current management situation, the Proposed RMP and Alternatives A, B, C and E are all likely to provide long-term, indirect, and beneficial impacts to cultural resources in the Vernal area. The Proposed RMP and Alternatives

A, C and E are likely to have the greatest beneficial impacts, as all involve withdrawing lands from mineral developments in certain areas.

4.3.2.4. IMPACTS OF MINERAL DECISIONS ON CULTURAL RESOURCES

Under the Proposed RMP and all alternatives, all undertakings related to minerals development would be in compliance with all federal cultural resource laws, including Section 106 of the NHPA, as well as agency guidance. Furthermore, the SHPO consultation concluded that no minerals decisions under the Proposed RMP or any alternatives would adversely impact cultural resources within the VPA.

The difference in effects on cultural resources between the alternatives is in the numbers of acres open to minerals development. Because the precise location of any minerals development activity is not stipulated in this planning document, the assessment of potential affects is based on the overall potential acreage open for development with respect to high and low site probability zones. Table 4.3.1 provides the acreage for each type of development under each alternative with respect to probability of involvement within high and low site probability zones.

Table 4.3.1. Summary of Minerals Development Relative to High and Low Cultural Resource-site Probability Zones

Oil and Gas Leases	Proposed RMP	Alternative A	Alternative B	Alternative C	Alternative D (No Action)	Alternative E
Acres within High Site Probability Zones						
Standard Lease Terms	265,0502	265,792	305,080	229,366	276,436	222,728
Timing and Controlled Surface Use	366,625	366,243	342,067	340,310	257,470	305,677
Total Open	634,678	632,035	647,147	569,676	533,906	528,405
No Surface Occupancy	35,598	32,787	27,808	34,063	65,671	27,298
Closed	38,415	43,878	33,745	104,961	33,735	153,049
Percent Change Relative to Alternative D (No Action)	18.9%	18.4%	21.2%	6.7%	0.0%	-1.0%
Acres within Low Site Probability Zones						
Standard Lease Terms	718,874	718,845	808,035	629,242	641,891	596,163
Timing and Controlled Surface Use	427,327	427,327	364,214	428,167	360,244	374,893
Total Open	1,146,201	1,146,172	1,172,249	1,057,409	1,002,135	971,056
No Surface Occupancy	33,704	33,704	14,245	24,606	71,259	20,331
Closed	25,424	25,424	18,806	123,285	18,806	213,987
Percent Change Relative to Alternative D (No Action)	12.6%	14.4%	17.0%	5.5%	0.0%	-3.1%
Other Minerals (Open)	Proposed RMP	Alternative A	Alternative B	Alternative C	Alternative D (No Action)	Alternative E
Acres within High Site Probability Zones						
Mineral Materials	169,476	173,050	173,050	154,096	157,137	142,469
Percent Change Relative to Alternative D (No Action)	7.9%	10.1%	10.1%	-1.9%	0.0%	-9.3%
Phosphate	51,679	52,343	52,343	37,714	50,038	32,591
Percent Change Relative to Alternative D (No Action)	3.3%	4.6%	4.6%	-24.6%	0.0%	-34.1%
Gilsonite (40' width)	226	453	453	226	217	223

Table 4.3.1. Summary of Minerals Development Relative to High and Low Cultural Resource-site Probability Zones

Oil and Gas Leases	Proposed RMP	Alternative A	Alternative B	Alternative C	Alternative D (No Action)	Alternative E
Percent Change Relative to Alternative D (No Action)	4.1%	108.8%	108.8%	4.1%	0.0%	2.8%
Acres within Low Site Probability Zones						
Mineral Materials	245,907	257,108	257,108	224,683	230,563	202,205
Percent Change Relative to Alternative D (No Action)	6.7%	11.5%	11.5%	-2.6%	0.0%	-12.3%
Phosphate	36,044	36,044	36,044	26,517	37,508	19,472
Percent Change Relative to Alternative D (No Action)	-3.9%	-3.9%	-3.9%	-29.3%	0.0%	-48.1%
Gilsonite (40' width)	611	1,224	1,224	608	601	567
Percent Change Relative to Alternative D (No Action)	1.7%	103.7%	103.7%	1.2%	0.0%	-5.7

Note: Acreages were calculated using GIS technology and there may be slight variations in total acres between disciplines. These variations are negligible and will not affect analysis.

It is important to note that not all minerals development activities would have the same impact on the landscape. Differing extraction processes would result in different surface-disturbances. In some cases, it is possible to provide additional analysis beyond simply estimating acres disturbed. For oil and gas and CBNG development, it is possible to project the estimated number of wells within each RFD area over the zones of high and low cultural resource site probability in order to estimate the likely disturbance within each cultural resource site probability zone of each RFD area (Table 4.3.2 and Table 4.3.3). This analysis results in a slightly more precise estimation of disturbance because it takes into account the differences in the distribution of projected development and the distribution of high and low cultural resource site probability zones. In essence, the analysis takes the percent of disturbance by wells relative to the total area open for development, applies that percentage to the acreages within high and low cultural resource site probability zones, and assumes that the disturbance within these zones is likely to be equal to the overall disturbance. In other words, the analysis assumes that disturbance is equally likely to occur in any zone. It is then possible to estimate the probable disturbance in each area and assess this disturbance. Furthermore, it is also possible to estimate the total number of sites that would become either identified or exposed to potential disturbance under oil, gas, and coal bed natural gas (CBNG) development. As described in the introduction to this section, a conservative average of measures of archaeological site density results in an estimation of 4.87 sites/square mile in high site probability zones and 0.93 sites/square mile in low site probability areas. While it must be understood that these averages are nothing more than conservative estimates, they provide a means of assessing the probable numbers of cultural resource sites that may be involved during oil, gas, and CBNG well development (Table 4.3.4).

Table 4.3.2. Estimated Disturbance in High Cultural Resource-site Probability Zones by Oil, Gas, and Coal Bed Natural Gas (CBNG) Development by RFD Area and Alternative

	Proposed RMP	Alternative A	Alternative B	Alternative C	Alternative D (No Action)	Alternative E
Open Acres within High Probability Zones for Cultural Sites*						
Monument Butte	189,911	187,085	190,624	187,235	155,475	183,232
East Tavaputs	227,627	227,627	228,189	193,791	173,014	191,251
West Tavaputs	41,590	41,590	48,962	42,157	42,427	41,429
Altamont	1,963	1,963	1,963	1,963	1,963	1,963
Tabiona	146,843	146,843	150,553	117,914	136,330	88,959
Manila	26,679	26,679	26,851	26,660	24,695	21,571
Total	634,679	631,787	647,142	569,720	533,904	528,405
Percent Potential Disturbance (Projected Total Disturbance Based on Wells/Total Open Area)						
Monument Butte	2.4%	2.3%	2.3%	2.6%	2.7%	2.7%
East Tavaputs	0.4%	0.4%	0.4%	0.4%	0.4%	0.3%
West Tavaputs	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
Altamont	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Tabiona	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Manila	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total*	3.1%	3.0%	3.0%	3.3%	3.4%	3.3%

Table 4.3.2. Estimated Disturbance in High Cultural Resource-site Probability Zones by Oil, Gas, and Coal Bed Natural Gas (CBNG) Development by RFD Area and Alternative

	Proposed RMP	Alternative A	Alternative B	Alternative C	Alternative D (No Action)	Alternative E
Estimated Disturbance in High Probability Zones (Percent Disturbance* Acres in Zone)						
Monument Butte	4,558	4,303	4,384	4,868	4,198	4,920
Percent Difference from Alternative D (No Action)	8.6%	2.5%	4.4%	16.0%	0.0%	17.2%
East Tavaputs	911	911	913	775	692	574
Percent Difference from Alternative D (No Action)	31.6%	31.6%	31.9%	12.0%	0.0%	-17.1%
West Tavaputs	83	83	98	84	85	83
Percent Difference from Alternative D (No Action)	-2.4%	-2.4%	15.3%	-1.2%	0.0%	-2.4%
Altamont	3	3	3	3	2	3
Percent Difference from Alternative D (No Action)	50.0%	50.0%	50.0%	50.0%	0.0%	50.0%
Tabiona	29	29	30	35	41	27
Percent Difference from Alternative D (No Action)	-29.3%	-29.3%	-26.8%	-14.6%	0.0%	-34.1%
Manila	3	3	3	3	2	2
Percent Difference from Alternative D (No Action)	50.0%	50.0%	50.0%	50.0%	0.0%	0.0%
Total	5,587	5,332	5,431	5,768	5,020	5,609
Percent Difference from Alternative D (No Action)	11.3%	6.2%	8.2%	14.9%	0.0%	11.7%

*Across all RFD areas

Note: Because the number of acres of surface disturbance by RFD does not decrease proportionately with the number of acres open in the RFD alternatives that have less proposed development may show a higher percentage of estimated disturbance.

Table 4.3.3. Estimated Disturbance in Low Cultural Resource-site Probability Zones by Oil, Gas, and Coal-bed Natural Gas Development by RFD Area and Alternative

	Proposed RMP	Alternative A	Alternative B	Alternative C	Alternative D (No Action)	Alternative E
Open Acres within Low Probability Zones for Cultural Sites*						
Monument Butte	482,389	481,521	487,902	475,855	432,826	468,709
East Tavaputs	322,506	322,506	324,087	263,161	173,014	250,332
West Tavaputs	116,392	116,392	129,748	42,153	42,427	93,795

Table 4.3.3. Estimated Disturbance in Low Cultural Resource-site Probability Zones by Oil, Gas, and Coal-bed Natural Gas Development by RFD Area and Alternative

	Proposed RMP	Alternative A	Alternative B	Alternative C	Alternative D (No Action)	Alternative E
Altamont	12,218	12,218	12,218	12,218	12,004	12,215
Tabiona	191,172	191,172	196,727	170,697	181,311	130,546
Manila	21,523	21,523	21,604	21,517	17,818	15,458
Total	1,146,200	1,145,332	1,172,286	985,601	859,400	971,055
Percent Potential Disturbance (Projected Total Disturbance based on Wells/Total Open Area)						
Monument Butte	1.3%	1.3%	1.3%	1.5%	1.7%	1.5%
East Tavaputs	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
West Tavaputs	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Altamont	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tabiona	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Manila	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total	1.6%	1.6%	1.6%	1.8%	2.0%	1.8%
Estimated Disturbance in Low Probability Zones (Percent Disturbance* Acres in Zone)						
Monument Butte	6,271	6,260	6,343	7,138	7,358	7,031
Percent Difference from Alternative D (No Action)	-14.8%	14.9%	13.8%	3.0%	0.0%	-4.4%
East Tavaputs	645	645	648	526	346	501
Percent Difference from Alternative D (No Action)	86.4%	86.4%	87.3%	52.0%	0.0%	44.8%
West Tavaputs	116	116	130	42	42	94
Percent Difference from Alternative D (No Action)	176.2%	176.2%	209.5%	0.0%	0.0%	123.8%
Altamont	4	4	4	5	5	5
Percent Difference from Alternative D (No Action)	-20.0%	-20.0%	-20.0%	0.0%	0.0%	0.0%
Tabiona	19	19	20	34	36	26
Percent Difference from Alternative D (No Action)	-47.2%	-47.2%	-44.4%	-5.6%	0.0%	-27.8%
Manila	1	1	1	2	1	1
Percent Difference from Alternative D (No Action)	0.0%	0.0%	0.0%	100%	0.0%	0.0%
Total	7,056	7,045	7,146	7,747	7,788	7,658
Percent Difference from Alternative D (No Action)	-9.4%	-9.5%	8.2%	-0.53%	0.0%	-1.7%

Table 4.3.4. Estimated Numbers of Cultural Resource Sites Potentially Involved in Oil, Gas, and Coal-bed Natural Gas Development by RFD Area and Alternative

Estimated Number of Sites Potentially Encountered by Development						
	Proposed RMP	Alternative A	Alternative B	Alternative C	Alternative D (No Action)	Alternative E
High Site Probability Zones*						
Monument Butte	35	33	33	37	32	37
East Tavaputs	7	7	7	6	5	4
West Tavaputs	1	1	1	1	1	1
Altamont	0	0	0	0	0	0
Tabiona	0	0	0	0	0	0
Manila	0	0	0	0	0	0
Subtotal	43	41	41	44	38	42
Low Site Probability Zones**						
Monument Butte	9	9	9	10	11	10
East Tavaputs	1	1	1	1	1	1
West Tavaputs	0	0	0	0	0	0
Altamont	0	0	0	0	0	0
Tabiona	0	0	0	0	0	0
Manila	0	0	0	0	0	0
Subtotal	10	10	10	11	12	11
Grand Total	53	51	51	55	50	53

(Number of acres of potential disturbance/640 acres per square mile) 4.87 sites/square mile

** (Number of acres of potential disturbance/640 acres per square mile)* 0.93 sites/square mile

Throughout this analysis, however, it is important to note that these numbers are produced through reasonable estimates of development and estimates of site density and location deriving from currently available data. Specific development or site location is unknown at this time. Therefore, the assessment of effects here will be considered a relative assessment; in other words, more acres open to development within high site probability zones will be considered to provide a greater likelihood for some type of effect on cultural resources, even if the actual effect is small or negligible. It should be understood that, strictly in terms of the minerals decisions alone, no alternative benefits cultural resources.

Mineral decisions would involve direct and indirect effects on cultural resources. Direct effects to cultural resources resulting from mineral decisions under the alternatives are related to the level of surface and subsurface disturbance permitted under the decisions. The greater the level of permitted surface and subsurface disturbance, the greater the potential for encountering cultural resources. Direct effects could entail: surface disturbance and even destruction of archaeological sites and features if unauthorized activities take place or if errors occur during the development process; physical alteration or elimination of archaeological sites as they are mitigated through data recovery or other on-site means when avoidance of the sites is not possible, as determined through the Section 106 process (see Appendix P for SHPO consultation); and long-term changes in overall site settings as the number of wells and

associated facilities increase. Avoidance of cultural resource sites is the preferred alternative under all scenarios. Although it is not possible to avoid the potential for irresolvable conflicts between any given specific proposed development in the future and archaeological sites, and although there is always potential for inadvertent discovery, historically, the ability to identify sites during the planning phase, and standard development stipulations that enable and promote site avoidance, has resulted in a relatively low rate of sites requiring mitigation and a very low rate of negative impacts to sites. According to the field office archaeologist, approximately 1% of the total cultural resource sites involved in oil and gas development have been negatively impacted by development (Blaine Phillips, personal communication 2004).

While sites within the area of potential direct effects will have been identified and either avoided or mitigated as part of the specific mineral development projects, sites not located within the footprints of undertakings are also vulnerable to negative impacts as human traffic in the general area increases. Potential indirect effects on cultural resources include vandalism and looting of cultural resource sites related to increased human activity within areas of mineral development. Other indirect negative impacts related to increased human activity in given areas include trampling of sites simply through the sheer volume of individuals visiting sites. Additional potential indirect effects include increased erosion on cultural resource sites located near well pads, pipelines, and other minerals related facilities where vegetation cover has been reduced or eliminated.

4.3.2.4.1. PROPOSED RMP

Under the Proposed RMP, oil and gas leasing would be open under standard lease terms or with timing and controlled surface use conditions on approximately 635,000 acres within the high site probability areas and approximately 1,146,000 acres within the low site probability areas (see Table 4.3.1). Based on projections of the numbers of wells, the size of each well and disturbance by associated facilities, approximately 19,000 acres would be subject to surface and subsurface disturbance. The majority of this disturbance (approximately 15,000 acres) would be within the Monument Butte RFD area, with approximately 3,500 acres in the East and West Tavaputs and Altamont-Bluebell areas, and small acreages in the remaining Tabiona and Manila areas. Assuming that disturbance is equally likely in high and low site probability areas, and that disturbance in these areas would be related to the overall disturbance relative to total land area, under the Proposed RMP the estimated acreage of disturbance in the high site probability zones is approximately 5,600 acres, with more than two-thirds of this disturbance in the Monument Butte RFD area (see Table 4.3.2). Estimated acreage of disturbance in the low site probability zones is approximately 7,000 acres under the Proposed RMP (see Table 4.3.3).

The Proposed RMP reflects a 11.3% overall increase in oil and gas (including CBNG) surface-disturbing activities in the high cultural resource site probability zones relative to Alternative D (No Action) (see Table 4.3.2). Relative to Alternative D (No Action), disturbance within high site probability zones would increase by 8.6-50% in several RFD areas, although it would decrease by 2.4% in the West Tavaputs area (see Table 4.3.2). The greatest percent increases are in the Altamont and Manila areas, though the actual acreage increase is only 1 acre in each area. The East Tavaputs area would experience a 31.6% increase in disturbance, which equates to a net increase in acres disturbed of 219 acres. The Proposed RMP is likely to result in

encountering approximately 43 sites within high site probability zones and 10 sites in low site probability zones, or approximately 53 sites total (see Table 4.3.4). This is an estimated increase of about 6% more sites over the estimated 50 sites that may be exposed to analysis under the Alternative D (No Action). It is important to note that these are the numbers of sites that are likely to be potentially encountered by development projects, and that they would not necessarily be disturbed. Given that only an estimated 1% of sites involved in minerals development are inadvertently disturbed, this alternative is likely to not result in significant disturbance to archaeological sites.

Impacts from projected development for oil shale, mineral materials, phosphate, and Gilsonite are much more difficult to quantify given that these projects have not been determined or set and are dependent on future technological advances and market needs, and that these developments involve different types of disturbances, and the disturbances are frequently more localized. Thus, assessment is best developed in terms of relative acres open to development. Based on the numbers of acres potentially open to development, the Proposed RMP results in increases of between 3 and 8% in development in high cultural resource site probability zones relative to the Alternative D (No Action) (see Tables 4.3.2 and 4.3.3). Projected impacts relative to phosphate development in low site probability areas actually drops by almost 4% under the Proposed RMP.

4.3.2.4.2. ALTERNATIVE A

Under Alternative A, oil and gas leasing would be open under standard lease terms or with timing and controlled surface use conditions on approximately 632,000 acres within the high site probability areas and approximately 1,145,000 acres within the low site probability areas (see Table 4.3.2). Based on projections of the numbers of wells, the size of each well and disturbance by associated facilities, approximately 19,000 acres would be subject to surface and subsurface disturbance. The majority of this disturbance (approximately 15,000 acres) would be within the Monument Butte RFD area. An additional 3,500-3,700 acres of disturbance would occur in the East and West Tavaputs and Altamont-Bluebell areas, and small acreages in the remaining Tabiona and Manila areas. Under Alternative A the estimated acreage of disturbance in the high site probability zones is approximately 4,300 acres, with more than two-thirds of this disturbance in the Monument Butte RFD area (see Table 4.3.2). Estimated acreage of disturbance in the low site probability zones is approximately 7,000 acres under Alternative A (see Table 4.3.3).

Alternative A reflects a 6.2% overall increase in oil and gas (including CBNG) surface-disturbing activities in the high cultural resource site probability zones relative to Alternative D (No Action) (see Table 4.3.2). Relative to Alternative D-No Action, disturbance within high site probability zones would increase by 2.5%–50% in several RFD areas, although it would decrease by 2.4%–29.3% in the West Tavaputs and Tabiona areas (see Table 4.3.2). The greatest percent increases (50%) are in the Altamont and Manila areas, though the actual acreage increased is only 1 acre in each area. The East Tavaputs area would experience a 31.6% increase in disturbance, which equates to a net increase in acres disturbed of 219 acres. Alternative A is likely to result in encountering approximately 41 sites within high site probability zones and 10 sites in low site probability zones, or approximately 51 sites total (see Table 4.3.4). This is an estimated increase of about 2% more sites over the estimated 50 sites that may be exposed to analysis under Alternative D (No Action). It is important to note that these are the numbers of

sites that are likely to be potentially encountered by development projects, and that they would not necessarily be disturbed. Given that only an estimated 1% of sites involved in minerals development are inadvertently disturbed, this alternative is likely to not result in significant disturbance to archaeological sites.

Under Alternative A, impacts from projected development for special tar sands, oil shale, mineral materials, phosphate, and Gilsonite would increase between 4 and 10% in development in high cultural resource site probability zones relative to Alternative D (No Action) (see Table 4.3.2). The greatest potential increase is in Gilsonite development. Projected impacts relative to phosphate development in low site probability areas actually drops by almost 4% under Alternative A.

4.3.2.4.3. ALTERNATIVE B

Under Alternative B, oil and gas leasing would be open under standard lease terms or with timing and controlled surface use conditions on approximately 647,000 acres within the high site probability areas and approximately 1,172,000 acres within the low site probability areas (see Table 4.3.1). Based on projections of the numbers of wells and the size of each well, approximately 19,000 acres would be subject to surface and subsurface disturbance. The majority of this disturbance (approximately 15,100 acres) would be within the Monument Butte RFD area, with approximately 3,600 acres in the East and West Tavaputs and Altamont areas, and small acreages in the remaining Tabiona and Manila areas. Assuming that disturbance is equally likely in high and low site probability areas, and that disturbance in these areas would be related to the overall disturbance relative to total land area, under Alternative B the estimated acreage of disturbance in the high site probability zones is approximately 54,600 acres, with more than two-thirds of this disturbance in the Monument Butte RFD area (see Table 4.3.2). The greatest increase in acreage of potential disturbance relative to Alternative D (No Action) is in the Monument Butte and East Tavaputs RFD areas, involving an additional 200 acres potentially subject to disturbance in each area. Estimated acreage of disturbance in the low site probability zones is approximately 7,100 acres under Alternative B (see Table 4.3.3).

Alternative B reflects an approximately 8% overall increase in oil and gas (including CBNG) surface-disturbing activities in the high cultural resource site probability zones relative to Alternative D (No Action). Relative to Alternative D (No Action), disturbance within high site probability zones would increase by 4-50% in several RFD areas (see Table 4.3.2). The greatest percent increases (50%) are in the Altamont and Manila areas, though the actual acreage increased is only 1 acre in each area. Based on an estimation of site counts, Alternative B is likely to result in encountering approximately 41 sites within high site probability zones and 10 sites in low site probability zones, or approximately 51 sites total, an increase of only 1 site over Alternative D (No Action) (see Table 4.3.4). It is important to note that these are the numbers of sites that are likely to be potentially encountered by development projects, and that they would not necessarily be disturbed.

In terms of development for oil shale, mineral materials, phosphate, and Gilsonite, Alternative B results in the same potential impacts as Alternative A (see Table 4.3.1). However, potential development by phosphate exploration and recovery decreases by approximately 4% relative to

the Alternative D (No Action). The greatest potential increase in high site probability areas is in Gilsonite development.

4.3.2.4.4. ALTERNATIVE C

Under Alternative C, oil and gas leasing would be open under standard lease terms or with timing and controlled surface use conditions on approximately 570,000 acres within the high site probability areas and approximately 986,000 acres within the low site probability areas (see Tables 4.3.2 and 4.3.3). Based on projections of the numbers of wells and the size of each well, approximately 18,800 acres would be subject to surface and subsurface disturbance. The majority of this disturbance (approximately 15,000 acres) would be within the Monument Butte RFD area, with approximately 3,500 acres in the East and West Tavaputs and Altamont areas, and small acreages in the remaining Tabiona and Manila areas. Assuming that disturbance is equally likely in high and low site probability areas, and that disturbance in these areas would be related to the overall disturbance relative to total land area, under Alternative C the estimated acreage of disturbance in the high site probability zones is approximately 5,768 acres, with more than two-thirds of this disturbance in the Monument Butte RFD area (see Table 4.3.2). Estimated acreage of disturbance in the low site probability zones is approximately 7,750 acres under Alternative B (see Table 4.3.3).

Alternative C reflects an approximately 15% overall increase in oil and gas (including CBNG) surface-disturbing activities in the high cultural resource site probability zones relative to Alternative D (No Action) and an approximately 0.5% decrease in disturbance in low cultural resource site probability zones. Relative to Alternative D (No Action), disturbance in high cultural resource site probability zones would increase by 12%–50% in several RFD areas, but would decrease by approximately 1% in the West Tavaputs RFD area. The greatest percent increases (50%) are in the Altamont and Manila areas, though the actual acreage increase is only 1 acre in each area. Alternative B is likely to result in encountering approximately 44 sites within high site probability zones and 11 sites in low site probability zones, or approximately 55 sites total (see Table 4.3.4).

Based on the numbers of acres potentially open to development for oil shale, mineral materials, phosphate, and Gilsonite, Alternative C results in an increase of 4% in Gilsonite development in high cultural resource site probability zones relative to Alternative D (No Action) and decreases between 2 and 25% for other minerals (particularly phosphate) development (see Table 4.3.1).

4.3.2.4.5. ALTERNATIVE D (NO ACTION)

Under Alternative D (No Action), oil and gas leasing would be open under standard lease terms or with timing and controlled surface use conditions on approximately 534,000 acres within the high site probability areas and approximately 859,000 acres within the low site probability areas (see Tables 4.3.2 and 4.3.3). Based on projections of the numbers of wells and the size of each well, approximately 18,212 acres would be subject to surface and subsurface disturbance. The majority of this disturbance (approximately 14,500 acres) would be within the Monument Butte RFD area, with approximately 3,400 acres in the East and West Tavaputs and Altamont areas, and small acreages in the remaining Tabiona and Manila areas. Assuming that disturbance is

equally likely in high and low site probability areas, and that disturbance in these areas would be related to the overall disturbance relative to total land area, under Alternative D (No Action) the estimated acreage of disturbance in the high site probability zones is approximately 5,100 acres, with more than two-thirds of this disturbance in the Monument Butte RFD area (see Table 4.3.2). Alternative D (No Action) projects the lowest amount of disturbance in high cultural resource site probability zones of any of the alternatives, but the difference between Alternative D (No Action) and Alternative C (which has the highest amount of proposed disturbance) is less than 750 acres. Estimated acreage of disturbance in the low site probability zones is approximately 7,800 acres under Alternative D (No Action) (see Table 4.3.3). Combined, the disturbance is slightly lower than projected under Alternative C. Alternative D (No Action) is likely to result in encountering approximately 38 sites within high site probability zones and 12 sites in low site probability zones, or approximately 50 sites total (see Table 4.3.4).

Based on the numbers of acres potentially open to oil shale, mineral materials, phosphate, and Gilsonite development, Alternative D (No Action) has overall less projected oil shale, phosphate, and Gilsonite development in high cultural resource site probability zones relative to the other alternatives (i.e., the Proposed RMP and Alternatives A and B), and slightly more mineral materials and phosphate development relative to Alternatives C and E (see Table 4.3.1).

4.3.2.4.6. ALTERNATIVE E

Under Alternative E, oil and gas leasing would be open under standard lease terms or with timing and controlled surface use conditions on approximately 528,405 acres within the high site probability areas and approximately 971,000 acres within the low site probability areas (see Tables 4.3.2 and 4.3.3). Based on projections of the numbers of wells and the size of each well, approximately 18,000 acres would be subject to surface and subsurface disturbance over the short-term. The majority of this disturbance (approximately 14,000 acres) would be within the Monument Butte-Red Wash RFD area, with approximately 2,350 acres in the East and West Tavaputs and Altamont-Bluebell areas, and the remainder of disturbances within the Tabiona-Ashley Valley and Manila-Clay Basin areas.

Alternative E reflects an approximately 11.7% overall increase in oil and gas (including CBNG) surface-disturbing activities in the high cultural resource site probability zones relative to Alternative D (No Action) and an approximately 1.7% decrease in disturbance in low cultural resource site probability zones. Relative to Alternative D (No Action), disturbance in high cultural resource site probability zones would increase by 50% in the Altamont-Bluebell and by 17% in the Monument Butte-Red Wash RFD areas. However, in the Altamont-Bluebell area, the actual net increase would only be 1 acre. Alternative E is likely to result in encountering approximately 42 sites within high site probability zones and 11 sites in low site probability zones, or approximately 53 sites total (see Table 4.3.4).

Based on the numbers of acres potentially open to development for oil shale, tar sands, conventional oil and gas, mineral materials, phosphate, and Gilsonite, Alternative E would have decreases in minerals development of between 2% and 34% in high cultural resource site probability zones relative to Alternative D (No Action) (see Table 4.3.1).

4.3.2.4.7. SUMMARY OF MINERALS DECISIONS

Overall, based on the numbers of acres open for development and consideration of the likely lease areas, Alternative E provides the greatest benefit to cultural resources from all action alternatives, followed by Alternative C. Alternatives C and E would result in a lowest increase in potential for conflicts with cultural resource sites. The Proposed RMP and Alternatives A and B have the greatest number of acres subject to potential disturbance of any of the alternatives. Alternative D (No Action) does have the least number of total acres affected, but the Hill Creek Extension (188,500 acres) was not leased in the Book Cliffs RMP and therefore is not included in the total acreage calculations of Alternative D (No Action), which accounts for the difference. Overall, the relative increases to Alternative D (No Action) are generally around 15% (except where RFD acreage areas are small, and net increases of a few acres increases the overall percentages dramatically, such as in the Altamont-Bluebell area, where an increase of 1 acre results in a percent comparable with Alternative D (No Action) with an increase of 50%), and a small additional number of sites are likely to be identified and subject to avoidance, mitigation, or potential impact through inadvertent discovery. It remains important to reiterate that specific minerals development projects will undergo another level of analysis, and will therefore be subject to Section 106 review. Consequently, the potential for actual negative direct impacts to occur to cultural resources is low.

4.3.2.5. IMPACTS OF NON-WSA LANDS WITH WILDERNESS CHARACTERISTICS DECISIONS ON CULTURAL RESOURCES

Management decisions to protect non-WSA wilderness characteristics would reduce the area in the VPA that would otherwise be vulnerable to surface development. Beneficial impacts of surface disturbance prohibitions to cultural resources would include a reduction in the likelihood of surface development, which would reduce the potential for unauthorized collection by exposing the site. Adverse impacts would result from resource protections that would prevent development-related detection of cultural sites. Discovery and pre-construction surveying of sites would increase the likelihood of site protection or scientific excavation, as well as prevent the degradation of sites from natural causes.

4.3.2.5.1. PROPOSED RMP

Under the Proposed RMP, 106,178 acres of non-WSA lands with wilderness characteristics would be protected. Management decisions include closing these areas to oil and gas leasing, limiting OHV travel to designated routes, closing to woodland product harvest and salvage, and designating these areas for management under VRM II class objectives. Impacts would include those described above. Compared to Alternatives, A, B, C, and D, this alternative would have greater impacts upon cultural resources, as there would be more restrictions on surface development.

4.3.2.5.2. ALTERNATIVES A–D

Under Alternatives A–D, non-WSA lands with wilderness characteristics would not be protected. Impacts to cultural resources would be dependant upon management prescriptions for other resources.

4.3.2.5.3. ALTERNATIVE E

Under Alternative E, 277,596 acres of non-WSA lands with wilderness characteristics would be protected. Management decisions to protect non-WSA wilderness characteristics would include closing these areas to oil and gas leasing and mineral material disposal, closing the areas to cross-country OHV travel, prohibiting vegetation treatments, prohibiting woodland harvesting and salvage, realty actions that exclude these areas from ROW consideration, and designating these areas for management under VRM I Class objectives. Impacts would be similar to those in the Proposed RMP, except the acreage affected would be greater and Alternative E protections are somewhat more restrictive. Compared to Alternative D (No Action), this alternative would have greater (beneficial) impacts upon cultural resources, as there would be more restrictions on surface development.

4.3.2.6. IMPACTS OF RANGELAND MANAGEMENT DECISIONS ON CULTURAL RESOURCES

Because of existing federal laws protecting cultural resources, the effect of rangeland management decisions on cultural resources within the VPA are likely to be minimal. The primary short- and long-term impacts to cultural resources would occur as result of surface and subsurface disturbance related to mechanical, chemical, and fire-related vegetation treatments, fencing, installation of guzzlers, creation of reservoirs, development of wells and springs, and installation of water pipelines. Although it is not possible to estimate the precise placement of these treatments and constructions, it is possible to estimate potential numbers of cultural resources involved in the treatments and constructions based on the acres associated. In general, increased acres of vegetation treatment would increase the possibility of involving cultural resources and raise the potential for adverse impacts. All rangeland improvements projects would require adherence to Section 106 of the NHPA and agency guidelines for the identification, evaluation, and protection of important cultural resource sites. As such, negative impacts to cultural resources from proposed rangeland improvements can either be avoided or mitigated.

Short and long-term indirect effects on cultural resources from rangeland improvement decisions are limited. It is anticipated that the primary negative indirect impact would be to increase the potential for concentrated trampling of cultural resource sites located in areas adjacent to fencing. As cattle, sheep, or other grazers walk back and forth along fence lines, their repeated footsteps typically wear entrenched trails that may pass through archaeological sites, and denude areas of vegetation thereby increasing erosion that would result in scouring or sheet washing of cultural resource sites in adjacent areas.

Utilizing the acreages for vegetation treatment and the acreages produced by the disturbance assumptions for fencing, pipelines, guzzlers, and wells, estimates of the numbers of acres proposed for the various actions and the probable numbers of cultural resource sites present were

produced for the analysis (Table 4.3.5). Because each type of action has different chances of landing in high, medium, or low cultural resource site probability zones, different estimates for numbers of sites per square mile were used for each proposed action. Vegetation treatments, fences, and pipelines are likely to cross both high and low site probability zones. Thus, for the analysis an average number of 2.9 sites per square mile (midway between the high and the low estimates) were utilized for these types of actions. Guzzlers and wells, while not necessarily directly over natural sources of water, are often located near natural water sources. Cultural resource sites are much more likely to be present near natural water sources, so a high estimate of 4.87 sites per square mile were utilized for these actions. While it must be understood that these averages are nothing more than conservative estimates, they provide a means of assessing the probable numbers of cultural resource sites that may be in an area subject to vegetation treatment, fencing, guzzlers, etc.

Table 4.3.5. Estimated Acres and Potential Cultural Resource Sites Associated with Rangeland Constructions and Vegetation Treatments by Alternative

	Proposed RMP	Alternative A	Alternative B	Alternative C	Alternative D (No Action)	Alternative E
From Rangeland Constructions						
Fencing	69.0	69.0	369	129	65	129
Acres	34.25	34.25	184.25	64.5	32.5	64.5
Pipeline	37.5	37.5	51	29.5	35	29.5
Acres	37.5	37.5	51	29.5	35	29.5
Subtotal Acres	71.75	71.75	235.25	94	67.5	94
Estimated Sites*	0	0	1	0	0	0
Guzzlers	812	812	1165	811	775	811
Acres	812	812	1165	811	775	811
Wells	51	51	78	87	74	87
Acres	51	51	78	87	74	87
Subtotal Acres	863	863	1243	898	849	898
Estimated Sites**	7	7	9	7	6	7
Total Acres	934.75	934.75	1478.25	992	916.5	992
Percent Change	2.0%	2.0%	61.3%	8.2%	0.0%	8.2%
Total Estimated Sites	7	7	10	7	6	7
From Vegetation Treatments						
Acres	34,640	34,640	50,900	45,860	40,390	45,860
Percent Change	-14.2%	-14.2%	26.0%	13.5%	0.0%	13.5%
Estimated Sites*	157	157	231	208	183	208

*Utilizes a moderate site density estimate of 2.9 sites/square mile

**Utilizes a high site density estimate of 4.87 sites/square mile

4.3.2.6.1. PROPOSED RMP

The level of potential surface and subsurface disturbance associated with these facilities under the Proposed RMP include 34,640 acres of vegetation treatment, 68.5 miles of fencing, 37.5 miles of water pipeline, 51 well/spring developments, and 812 guzzler or reservoir projects.

Relative to Alternative D (No Action), the current management situation, this action includes minor increases in the acres affected by rangeland constructions, with no significant increase in the numbers of sites potentially involved. Increases from guzzlers and wells are also minor, with only potentially one or a few additional sites involved. Vegetation treatments would decrease by about 14% under this alternative relative to Alternative D (No Action), and would likely involve approximately 157 sites, or slightly fewer than under Alternative D (No Action). Fencing, pipelines, guzzlers, and wells are likely to involve approximately 7 sites, roughly comparable to Alternative D (No Action).

4.3.2.6.2. ALTERNATIVE A

Alternative A would be the same as the Proposed RMP. As such, potential impacts under Alternative A would be the same as those described in Section 4.3.2.5.1.

4.3.2.6.3. ALTERNATIVE B

Under Alternative B 50,900 acres of would be subject to vegetation treatment, 368.5 miles of fencing would be installed, 51 miles of water pipeline would be installed, 78 well/spring developments would be undertaken, and 1,165 guzzler or reservoir projects would be completed. These acreages, miles, and numbers of facilities reflect an approximately 61% increase over the acreages proposed under Alternative D (No Action), the current management situation. Vegetation treatments increase by about 26% and are likely to involve approximately 230 sites, higher than under any alternative. Fencing, pipelines, guzzlers, and wells are likely to involve approximately 10 sites, slightly higher than Alternative D (No Action).

4.3.2.6.4. ALTERNATIVE C

Under Alternative C a total of 45,860 acres of would be subject to vegetation treatment, 129 miles of fencing would be installed, 29.5 miles of water pipeline would be installed, 87 well/spring developments would be undertaken and 811 guzzler or reservoir projects would be completed. These acreages, miles, and numbers of facilities reflect an approximately 8% increase over the acreages proposed under Alternative D (No Action), the current management situation. Vegetation treatments are likely to involve approximately 208 sites, which is less than Alternatives B and E, but higher than the Proposed RMP and Alternatives A and D (No Action). Fencing, pipelines, guzzlers, and wells are likely to involve approximately 7 sites, roughly comparable to Alternative D (No Action).

4.3.2.6.5. ALTERNATIVE D (NO ACTION)

Under Alternative D (No Action) a total of 40,390 acres of would be subject to vegetation treatment, 65 miles of fencing would be installed, 35 miles of water pipeline would be installed, 74 well/spring developments would be undertaken and 775 guzzler or reservoir projects would be completed. Vegetation treatments are likely to involve approximately 180 sites, the second-fewest of any alternative. Fencing, pipelines, guzzlers, and wells are likely to involve approximately 6 sites, roughly comparable to the other alternatives.

4.3.2.6.6. ALTERNATIVE E

Alternative E would proposed the same management decisions as those under Alternative C, with similar impacts as discussed under that alternative.

4.3.2.6.7. SUMMARY OF RANGELAND MANAGEMENT DECISIONS

Overall, the Proposed RMP and Alternatives A and D (No Action) are likely to have the lowest potential for negative impacts to cultural resources under any alternative. The Proposed RMP and Alternative A would have the lowest number of potential acres of vegetation treatment, and second lowest disturbance for fencing and pipelines. Alternative D (No Action) has the lowest number of sites potentially involved in guzzler or spring developments. The Proposed RMP and Alternative A have the lowest number of sites potentially involved in vegetation treatments, and an overall decrease of almost 26 sites potentially involved in such treatments relative to Alternative D (No Action). Thus, direct and indirect effects are likely to be lowest for these alternatives. Alternatives C and E would have a slightly greater increase in acreages and sites involved. Alternative B would have the greatest increase in numbers of sites involved and is the alternative most likely to pose the greatest potential for direct and indirect negative impacts to cultural resources. However, due to the additional level of analysis required for compliance with Section 106 of the NHPA and agency regulations, the potential for adverse impacts to cultural resources would be low

4.3.2.7. IMPACTS OF RECREATION DECISIONS ON CULTURAL RESOURCES

Direct effects to cultural resources resulting from recreation decisions are related to the level of surface and subsurface disturbance associated with recreational development and use and with the degree of increased human activity associated with said development and use. Increased human activity in areas where cultural resources are present also tends to correspond with increased levels of vandalism and looting of said resources. In both the short- and the long-term, the greater the level of surface and subsurface disturbance associated with recreational development and use, the greater is the potential that cultural resources would be adversely impacted. Concomitantly, the greater the level of human activity, the greater is the potential for cultural resources within a recreational area to be adversely impacted by the sheer volume of individuals walking over or visiting sites. Human activity, however, can occur in a managed setting, where recreational areas are developed and in an unmanaged setting where recreational use occurs as a result of other management decisions.

Additional long-term direct effects on cultural resources include the physical alteration or elimination of archaeological sites as they are mitigated through data recovery or other on-site means when avoidance of the sites is not possible for recreational development and use, as determined through the Section 106 process. The net effect of mitigating multiple sites in a given area when avoidance is not possible is the gradual alteration, and eventual elimination, of the overall archaeological record within the developed area. It should be noted, however, that mitigation of archaeological sites does have a limited positive effect in that new scientific knowledge of prehistoric and historic land uses within an area may be obtained in this manner. Other long-term direct impacts may include increases in levels of trampling and vandalism associated with increased human activity in given recreational areas. It should be noted,

however, that regulated recreational use of areas tends to provide better protection to cultural resources than does unregulated use.

While sites within the area of potential direct effects would have been identified and either avoided or mitigated as part of specific development projects, sites not located within the footprints of undertakings are also vulnerable to negative impacts as human traffic in the general area increases. Potential indirect effects on cultural resources under all recreation alternatives include vandalism and looting of cultural resource sites related to increased human activity within areas of recreational development. Other indirect negative impacts related to increased human activity in given areas include trampling of sites simply through the sheer volume of individuals visiting sites. Additional potential indirect effects include increased erosion on cultural resource sites located in the vicinity of trails, campgrounds, and other recreational facilities where vegetation cover has been reduced or eliminated and/or water runoff is not appropriately controlled.

4.3.2.7.1. PROPOSED RMP

Under the Proposed RMP, 133,560 acres would be specifically managed as SRMAs in the following areas: Blue Mountain (42,729 acres); Browns Park (18,490 acres); Red Mountain-Dry Fork (24,259 acres); Nine Mile Canyon (44,168 acres); Pelican Lake (1,014 acres); Fantasy Canyon (69 acres) and White River (2,831 acres). These areas contain large numbers of acres within high cultural resource site probability zones (Blue Mountain-approximately 26,000 acres; Browns Park-approximately 18,490 acres; Nine Mile Canyon-approximately 32,000 acres; White River-approximately 2,831). Consequently, there is very good potential for cultural resource sites to occur in these zones, and negative impacts would continue to occur. However, the designation of a SRMA allows for the potential to manage these impacts, in contrast to the no-action alternative where for the most part these areas are used for recreation with little or no management. The proposed designations reflect a substantial increase of 45,657 acres beyond the current SRMA management (87,928 acres).

All SRMAs would be managed according to the philosophy of multiple-use. Additionally, 400 miles of non-motorized trails would be improved and/or developed, and restrictions would be placed on the use of OHVs for retrieval of big game off designated routes. A total of 800 miles of motorized OHV trails would be developed under this alternative. Also under the Proposed RMP, a management plan would be prepared for the Fantasy Canyon SRMA, and this plan would include prescriptions for the protection of cultural resources with high scientific, experimental, conservation, and traditional values, and the interpretation of cultural resources with high public use values. Under the Proposed RMP, new cabin construction would be allowed within the VPA. The Proposed RMP incorporates substantially greater numbers of acres into SRMAs than does Alternative D (No Action). Alternative D (No Action) generally allows for unrestricted and unconfined use of BLM lands for recreation. While the designation of SRMAs generally includes surface and subsurface disturbance related to recreational development and does increase human activity in given areas, such designations and associated development are subject to compliance with cultural resource laws, as noted previously. These designations also require the preparation of management plans that must include prescriptions for the protection of important cultural resource values. As such, even though the Proposed RMP incorporates greater

numbers of acres into SRMAs and miles into non-motorized and motorized trails, these designations include protocols designed to protect cultural resources.

4.3.2.7.2. ALTERNATIVE A

Under Alternative A, approximately 499,588 acres would be specifically managed as SRMAs in the following areas: Blue Mountain (42,758 acres); Book Cliffs (273,486 acres); Browns Park (52,720 acres); Pelican Lake (1,014 acres); Red Mountain-Dry Fork (24,259 acres) Nine Mile Canyon (81,168 acres); and White River (24,183 acres). These areas contain large numbers of acres within high cultural resource site probability zones (Blue Mountain-approximately 26,000 acres; Book Cliffs-approximately 197,000 acres; Browns Park-approximately 38,000 acres; Nine Mile Canyon-approximately 32,000 acres; White River-approximately 20,000 acres). Consequently, there is very good potential for cultural resource sites to occur in these zones, and negative impacts would continue to occur. However, the designation of a SRMA allows for the potential to manage these impacts, in contrast to the no-action alternative where for the most part these areas are used for recreation with little or no management. The proposed designations reflect a significant increase, approximately 455,000 acres over the current acres (18,474) represented by SRMAs in the area. All SRMAs would be managed according to the philosophy of multiple-use.

4.3.2.7.3. ALTERNATIVE B

Improvement, development, and/or restriction of non-motorized trails would be the same as under the Proposed RMP. Under Alternative A, a management plan would be prepared for the Fantasy Canyon SRMA, and this plan would include prescriptions for the protection of cultural resources with high scientific, experimental, conservation, and traditional values, and the interpretation of cultural resources with high public use values. Under Alternative A, new cabin construction would be allowed within the VPA. Alternative A incorporates substantially greater numbers of acres into SRMAs than does Alternative D (No Action). Alternative D (No Action) generally allows for unrestricted and unconfined use of BLM lands for recreation. While the designation of SRMAs generally includes surface and subsurface disturbance related to recreational development and does increase human activity in given areas, such designations and associated development are subject to compliance with cultural resource laws, as noted previously. These designations also require the preparation of management plans that must include prescriptions for the protection of important cultural resource values. As such, even though Alternative A incorporates greater numbers of acres into SRMAs and miles into non-motorized and motorized trails, these designations include protocols designed to protect cultural resources.

As with the Proposed RMP, direct effects to cultural resources resulting from recreation decisions under Alternative B are related to the level of surface and subsurface disturbance associated with recreational development and use and with the degree of increased human activity associated with said development and use. Under Alternative B, a total of 86,454 acres would be managed within SRMAs: 44,181 acres in Nine Mile Canyon, 24,259 acres in Red Mountain-Dry Fork, 1,014 would be managed for Pelican Lake, and 17,000 acres in Browns Park. All designated SRMAs would be managed according to the philosophy of multiple-use.

Additionally under Alternative B, no non-motorized or motorized trails would be improved or developed, and OHV use off of designated trails would not be allowed for big game retrieval. Under Alternative B, no management plan would be prepared for the Fantasy Canyon SRMA, and unrestricted and unconfined recreational use of the Book Cliffs would continue as currently managed. Under Alternative B, new cabin construction would be allowed within the VPA in specific areas.

Alternative B is roughly comparable to Alternative D (No Action) in terms of acres managed as SRMAs and miles developed for non-motorized and motorized trails. Alternative B generally allows for unrestricted and unconfined use of BLM lands for recreation. As noted above, such allowances tend to increase adverse impacts to cultural resources as compared to areas that are actively managed for recreational uses.

4.3.2.7.4. ALTERNATIVE C

Under Alternative C, 522,604 acres would be specifically managed as SRMAs in the following areas: Book Cliffs (273,486 acres); Fantasy Canyon (69 acres); Browns Park (52,720 acres); Red Mountain-Dry Fork (24,259 acres); Nine Mile Canyon (81,168 acres), White River (47,130 acres), Blue Mountain (42,758 acres), and Pelican Lake (1,014 acres). These areas contain large numbers of acres within high cultural resource site probability zones (Blue Mountain-approximately 26,000 acres; Book Cliffs-approximately 196,000 acres; Browns Park-approximately 38,000 acres; Nine Mile Canyon-approximately 32,000 acres, White River-approximately 40,000 acres, all of the acreages in Fantasy Canyon are considered low site probability zones). All designated SRMAs would be managed according to the philosophy of multiple-use, and unlike under other alternatives, portions of the Book Cliffs SRMA would be open to oil and gas development under Alternative C. Under Alternative C, 400 miles of non-motorized trails would be improved and/or developed, and restrictions would be placed on the use of OHVs for retrieval of big game off designated routes. No motorized OHV trails would be developed under this alternative. Under Alternative C, no new cabin construction would be allowed within the VPA.

Compared to the other alternatives, Alternative C is roughly comparable to the Proposed RMP although slightly fewer acres would be managed as SRMAs under the Proposed RMP. None of the 69 acres proposed for the Fantasy Canyon SRMA fall within high site probability zones. The proposed designations reflect a substantial increase of acres over the current acres represented by SRMAs in the area.

4.3.2.7.5. ALTERNATIVE D (NO ACTION)

Under Alternative D (No Action), the impacts on SRMAs would be the same as discussed above under Alternative B because the management decisions are the same. Additionally under Alternative D (No Action), 55 miles of non-motorized trails would be improved or developed. The Red Mountain-Dry Fork trail would be managed as a motorized OHV trail. No specifications are given for OHV use off designated trails for the retrieval of big game. Under Alternative D (No Action), development of a management plan for the Fantasy Canyon SRMA is unspecified as is the management of Blue Mountain as an SRMA. In general, Alternative D (No

Action) would allow for unrestricted and unconfined recreational use of most areas within the VPA. Under Alternative D (No Action), management of new cabin construction is unspecified.

4.3.2.7.6. ALTERNATIVE E

Alternative E recreation decisions would be the same as those described under Alternative C, with similar impacts on cultural resources, except that approximately 157,018 acres within the proposed SRMAs would be managed to protect non-WSA areas with wilderness characteristics, and for primitive, non-motorized/non-mechanized recreational opportunities. These protected areas would be managed under VRM I Class objectives, closed to cross-country OHV use, and closed to private wood cutting and seed collection. The impacts on cultural resources from non-WSA wilderness area protection within the proposed SRMAs would be beneficial in the long term because of the prohibitions and limitations on surface disturbances within these areas (to protect wilderness values) that would also protect cultural resources from surface disturbances.

Compared to Alternative D (No Action), this alternative would be more beneficial to cultural resources because more protection would be applied to cultural resources within the SRMAs than under Alternative D (No Action).

4.3.2.7.7. SUMMARY OF RECREATION DECISIONS

Alternative E would have the greatest potential for positive impacts to cultural resources because of the additional protection applied to the resource from non-WSA wilderness area protection. Alternatives C and A would provide a high degree of protection through the relatively large number of acres proposed as SRMAs, when compared to Alternative D (No Action). Alternative B would be comparable to Alternative D in the level of protection applied to cultural resources. Although there is a potential for direct and indirect negative impacts from increased recreation in the areas proposed for SRMA designation, the management of these areas under specific plans to protect SRMA resources would be beneficial to cultural resources in the long term.

4.3.2.8. IMPACTS OF SPECIAL DESIGNATION DECISIONS ON CULTURAL RESOURCES

Significant impacts to cultural resources from special designation decisions are direct, long-term, and generally beneficial. These positive impacts are related to the restriction of surface-disturbing activities and limitations placed on land uses within areas of special designation. The reduction, control, or elimination of surface-disturbing activities, such as oil and gas development and OHV travel, within large geographic areas affords significant protection to cultural resource sites and insures preservation of the important scientific, experimental, conservation, and traditional use values of these resources. Long-term direct positive impacts on cultural resources from special designation decisions include increased protection of cultural resource use values through the overall reduction of surface-disturbing activities within some of the specially designated areas. While a direct one-to-one correlation of acres disturbed to cultural resources encountered does not exist, relative ratios of higher numbers of acres disturbed to higher numbers of sites encountered and fewer acres disturbed to fewer sites encountered can be assumed. Thus, with the specific controls and restrictions placed on surface-disturbing activities under some of the special designations, the long-term net effect would be an overall decrease in

the numbers of sites subject to impacts, including those resulting from mitigation where avoidance is not possible. Furthermore, the designations may contribute to the preservation of site settings and view sheds, spiritual settings and values, and cultural resource site feelings and association and conservation of areas of tribal importance. There are no measurable short-term or long-term indirect effects on cultural resources resulting from special designation decisions.

4.3.2.8.1. PROPOSED RMP

Under the Proposed RMP, the following areas (and acreages) are proposed for ACEC designation in addition to (or differing from) the current designations: Browns Park (18,490 acres), Lears Canyon (1,375 acres), Nine Mile Canyon (44,168 acres), Pariette (10,437 acres), Red Creek Watershed (24,475 acres), Lower Green River Corridor (8,470 acres) and the Red Mountain-Dry Fork Complex (24,285 acres). All of these areas contain between 10,000 and 35,000 acres each within the zones of high potential for cultural resource sites. The acreages identified for each specially designated area represent increases over existing management acreages for established areas of special designation. Further, recommendation for designation of the Upper Green River and the Lower Green River as wild and scenic rivers affords additional protection to cultural resources adjacent to said river segments as surface-disturbing activities in these adjacent areas would be restricted to insure maintenance of those characteristics rendering these river segments eligible for special designation. Compared to Alternative D (No Action), the Proposed RMP provides increased benefit to cultural resources.

4.3.2.8.2. ALTERNATIVE A

Under Alternative A, the following areas (and acreages) are proposed for ACEC designation in addition to (or differing from) the current designations: Bitter Creek (68,834 acres), Browns Park (52,721 acres), Coyote Basin (87,743), Lears Canyon (1,375 acres), Lower Green River (10,170 acres), Nine Mile Canyon (48,000 acres), Pariette (10,437 acres), Red Creek Watershed (24,475 acres), Red Mountain-Dry Fork Complex (24,285 acres), and White River (17,810 acres). All of these areas contain between 10,000 and 35,000 acres each within the zones of high potential for cultural resource sites. The acreages identified for each specially designated area represent increases over existing management acreages for established areas of special designation. Further, recommendation for designation of two segments of the White River, one segment of the Upper Green River, and one segment of the Lower Green River as wild and scenic rivers affords additional protection to cultural resources adjacent to said river segments as surface-disturbing activities in these adjacent areas would be restricted to ensure maintenance of those characteristics rendering these river segments eligible for special designation. Also under Alternative A, the Lower Green River found suitable for designation as wild and scenic would be managed as such. The segment of the Green River between Little Hole and the Colorado State Line would be managed as a wild and scenic river with a classification of scenic until such time as Congress makes a decision as to whether or not to include this river segment in the national Wild and Scenic River system. Compared to Alternative D (No Action), Alternative A provides increased benefit to cultural resources.

4.3.2.8.3. ALTERNATIVE B

Under Alternative B, the following areas (and acreages) are proposed for ACEC designation in addition to (or differing from) the current designations: Browns Park (18,474 acres), Coyote Basin (47,659 acres), Lears Canyon (1,375 acres), Nine Mile Canyon (44,181 acres), Pariette (10,437 acres), Red Creek (24,475 acres), and Red Mountain-Dry Fork Complex (24,285 acres). This constitutes a reduction in number of separate areas defined relative to the Proposed RMP and it does not designate Lower Green River as does Alternative D (No Action). Only the Upper and Lower Green would be recommended for designation as a WSR.

4.3.2.8.4. ALTERNATIVE C

Under Alternative C, the following acreages are proposed for ACEC designation: Bitter / P.R. Spring (147,425 acres), Browns Park (52,721 acres), Coyote Basin-Coyote Basin (26,590 acres), Coyote Basin-Kennedy Wash (10,670 acres), Coyote Basin-Myton Bench (36,670 acres), Coyote Basin-Shiner (21,957 acres), Coyote Basin-Snake John (28,274 acres), Four Mile Wash (50,280 acres), Lears Canyon (1,375 acres), Lower Green River Expansion (10,170 acres), Main Canyon (100,915 acres), Middle Green River (6,768 acres), Nine Mile Canyon (81,168 acres), Pariette (10,437 acres), Red Creek (24,275 acres), Red Mountain-Dry Fork Complex (24,285 acres), White River (47,130 acres). Between 1,000 and 75,000 acres within high cultural resource site probability zones are present in these proposed areas. Unlike decisions under the other three alternatives, decisions under Alternative C would also include the designation of 50,280 acres of land in the Four Mile Wash area as an ACEC/ONA, approximately 7,000 of these acres are within high cultural resource site probability zones.

Under Alternative C three segments of the White River would be recommended for wild and scenic designations, and one segment each of Nine Mile Creek, Argyle Creek, and the Middle Green River would be recommended for wild and scenic designation with a classification of recreational. Additionally, one segment each of Evacuation Creek, Nine Mile, and Bitter Creek would be recommended for wild and scenic designation with a classification of scenic. Further, the segment of the Green River between Little Hole and the Colorado State Line would be managed as a wild and scenic river with a classification of scenic until such time as Congress makes a decision as to whether or not to include this river segment in the national Wild and Scenic River system.

The overall nature of the direct effect of special designation decisions on cultural resources under Alternative C is similar to but greater than that described for the Proposed RMP and Alternatives A and B. Under Alternative C, significantly higher numbers of acres would be designated as special status and would be subject to the restrictions and controls on surface and subsurface disturbance and land use that provide positive protective benefits to cultural resources within the designated areas. Under Alternative C, approximately 195,000 more acres within zones of high probability for cultural resource sites would be protected relative to the Proposed RMP and approximately 210,000 more acres would be protected relative to Alternatives B and D.

4.3.2.8.5. ALTERNATIVE D (NO ACTION)

The net positive direct effect of proposed ACEC designation on cultural resources under Alternative D (No Action) is substantially less than those under all action alternatives. Under Alternative D (No Action), no new special area designations would be made. Only those existing ACECs of the Lower Green River west bank (8,470 acres), Browns Park (52,721 acres), Red Mountain-Dry Fork (24,285 acres), Nine Mile Canyon (44,181 acres), Pariette (10,437 acres), Red Creek (24,475 acres) and Lears Canyon (1,375 acres) would be managed according to special designation management restrictions and controls on surface-disturbing activities and land uses. Also under Alternative D (No Action), the Lower Green River found suitable for designation as wild and scenic would be managed as such. The segment of the Green River between Little Hole and the Colorado State Line would be managed as a wild and scenic river with a classification of scenic until such time as Congress makes a decision as to whether or not to include this river segment in the national Wild and Scenic River system.

4.3.2.8.6. ALTERNATIVE E

The special designation decisions and impacts on cultural resources would be similar to those discussed under Alternative C, except that the approximately 197,171 acres of non-WSA areas with wilderness characteristics that lie within proposed ACECs would have protection measures as discussed above under Section 4.3.2.6.5 for Recreation. The impacts on cultural resources would be similar to those for SRMAs: the management decisions would substantially limit or prohibit surface disturbances within these areas in order to protect their wilderness values, which would also afford long term, beneficial protection to cultural resources. This alternative would have more beneficial impacts on cultural resources than Alternative D (No Action) because, as discussed under the Recreation above, more resource-protective surface disturbance prohibitions and limitations would be applied under Alternative E.

4.3.2.8.7. SUMMARY OF SPECIAL DESIGNATION DECISIONS

Overall, Alternative E has the greatest potential long-term direct and indirect benefit to cultural resources of all the alternatives. Alternative C has the second-greatest benefit, followed by the Proposed RMP, then Alternative B, and Alternative D (No Action).

4.3.2.9. IMPACTS OF TRAVEL DECISIONS ON CULTURAL RESOURCES

Travel decisions, such as the designation of areas open, limited, or closed to OHV travel and the designation of travel routes can impact cultural resources in a number of ways. Negative direct effects can result from construction of new roads and trails that would disturb archaeological sites, from allowing OHV travel in areas with cultural resource sites, or allowing motorized camping vehicles to travel off designated routes on a single path up to 300 feet to access an existing disturbed dispersed camp site, except in non-WSA lands with wilderness characteristics and WSA lands. Indirect effects can result from increased traffic in the area and the potential for the traffic along designated routes to develop into access to and subsequent travel over or even looting of nearby cultural resource sites.

However, there can also be benefits to cultural resources from travel decisions. Cultural resources located in areas closed for OHV use or with restrictions placed on OHV use would receive the greatest positive benefit by either eliminating or reducing the potential for travel-related damage to cultural resource sites by closing or re-routing travel ways around important cultural resource sites and restricting vehicular travel to those designated routes. Thus, with the specific controls and restrictions placed on travel activities under the travel decisions, the long-term net effect would be an overall decrease in the numbers of sites subject to impacts.

While there is not a one-to-one correlation between acreage of routes and exact numbers of cultural resources encountered, a basic ratio of acres of routes to sites encountered can be assumed such that the greater the acreage of disturbance the greater the potential for encountering cultural resources. For the purposes of analysis, areas of open, limited, or closed OHV travel were combined with zones of high and low cultural resource site probability to determine the probable numbers of acres potentially subject to negative impacts from OHV travel (Table 4.3.6). To determine potential impacts in areas where travel is limited to designated routes and motorized camping vehicles would be allowed to travel off designated routes on a single path up to 300 feet to access an existing disturbed dispersed camp site, except in non-WSA lands with wilderness characteristics and WSA lands, a 300-foot zone was established on either side of the designated routes for the Proposed RMP and each alternative, and the acreages within areas of high and low cultural resource site probability were calculated accordingly for the Proposed RMP and each alternative (Table 4.3.7). An estimation of 4.87 sites per square mile in high site probability zones and 0.93 sites per square mile in low site probability areas was then applied to estimate the number of potential cultural resource sites involved under each scenario. While it must be understood that these averages are nothing more than conservative estimates, they provide a means of assessing the probable numbers of cultural resource sites that may be in an area open to OHV travel (see Table 4.3.6) or within the 300-foot area allowed for recreation use (and potential indirect negative impacts) associated with allowing limited travel on designated routes (see Table 4.3.6).

Table 4.3.6. Estimated Numbers of Acres Open to OHV Travel and Limited OHV Travel in High and Low Cultural Resource-site Probability Zones, and Estimated Numbers of Cultural Resource Sites Potentially within Open OHV Travel Areas by Alternative

	Proposed RMP	Alternative A	Alternative B	Alternative C	Alternative D (No Action)	Alternative E
Acres in High Site Probability Zones						
Open	236	236	236	236	251,120	236
% Change	-99.9%	-99.9%	-99.9%	-99.9%	0.0%	-99.9%
Potential Sites	2	2	2	2	1,911	2
Limited	587,212	587,212	592,986	478,924	355,539	469,497
% Change	65.2%	65.2%	66.8%	34.7%	0.0%	32.1%
Acres in Low Site Probability Zones						
Open	5,966	5,966	5,198	5,198	526,700	5,198
Percent Change	-98.9%	-98.9%	-99.0%	-99.0%	0.0%	-99.0%
Potential Sites	9	9	8	8	765	8

Table 4.3.6. Estimated Numbers of Acres Open to OHV Travel and Limited OHV Travel in High and Low Cultural Resource-site Probability Zones, and Estimated Numbers of Cultural Resource Sites Potentially within Open OHV Travel Areas by Alternative

	Proposed RMP	Alternative A	Alternative B	Alternative C	Alternative D (No Action)	Alternative E
Acres in High Site Probability Zones						
Limited	1,058,746	1,058,746	1,066,916	875,740	532,876	858,904
% Change	98.7%	98.7%	100.2%	64.3%	0.0%	61.2%
Total Open Acreage	6,202	6,202	5,434	5,434	787,820	5,434
Total Potential Sites	11	11	10	10	2752	10

(Note: Potential sites for areas associated with limited travel are estimated on the next table)

Table 4.3.7. Estimated Acres and Potential Cultural Resource Sites Associated with Travel Routes and the 300-foot Travel Buffer by Alternative

	Proposed RMP	Alternative A	Alternative B	Alternative C	Alternative D (No Action)	Alternative E
Within High Cultural Site Probability Zones						
Acres	49,554	49,554	49,370	46,604	68,852	44,800
% Change	-28.0%	-28.0%	-28.3%	-32.3%	0.0%	-34.9%
Potential Sites	377	377	376	355	524	339
Within Low Cultural Site Probability Zones						
Acres	71,748	71,748	71,746	69,102	91,699	68,279
% Change	-21.8%	-21.8%	-21.8%	-24.6%	0.0%	-25.5%
Potential Sites	104	104	104	100	133	99
Total Acres	121,302	121,302	121,116	115,706	160,551	113,079
% Change	-24.4%	-24.4%	-24.6%	-27.9%	0.0%	-29.6%
Total Potential Sites	481	481	480	455	657	438

4.3.2.9.1. PROPOSED RMP

Compared to the other action alternatives and to the current management situation, the Proposed RMP provides a much greater level of benefit to cultural resources within the VPA. The Proposed RMP provides for the limitation of travel to designated routes for 1,643,475 acres of land. Approximately 240 acres would remain open to OHV travel in high cultural resource site probability zones and approximately 6,000 acres would remain open in low cultural resource site probability zones, a nearly 100% decrease in the amount of acreage open to unrestricted travel within each site probability zone as compared to Alternative D (No Action) (see Table 4.3.6). Based on the estimates for sites/square mile described above, approximately 11 sites may be present in these open areas and would continue to see impacts that may be already occurring (see

Table 4.3.6). However, not all of these sites would necessarily continue to be impacted or would necessarily be newly impacted. The number of sites is also greatly reduced relative to the no-action alternative, which has approximately 2,700 sites within areas that are currently open to OHV travel.

Under the Proposed RMP, multiple areas would have travel restricted to existing routes. Approximately 121,300 acres of land are located in or allowing motorized camping vehicles to travel off designated routes on a single path up to 300 feet to access an existing disturbed dispersed camp site, except in non-WSA lands with wilderness characteristics and WSA landset of either side of existing routes (see Table 4.3.7). This represents an approximately 25% reduction in open area overall relative to Alternative D (No Action), with an approximately 28% reduction in open area within high cultural resource site probability zones (see Table 4.3.7). Based on reasonable projections of numbers of sites within high and low probability zones, this alternative would potentially expose approximately 480 cultural resource sites to ongoing impacts or potentially new impacts. However, this number is approximately 27% lower than the nearly 660 sites that are currently potentially subject to impacts.

4.3.2.9.2. ALTERNATIVE A

Alternative A would be the same as the Proposed RMP. As such, potential impacts from Alternative A are the same as those described in Section 4.3.2.8.1.

4.3.2.9.3. ALTERNATIVE B

Alternative B provides for the limitation of travel to designated routes for 1,659,901 acres of land currently open to unrestricted OHV travel, or a 99.5% decrease in areas open to travel. Approximately 240 acres would remain open to OHV travel in high cultural resource site probability zones and approximately 5,200 acres would remain open in low cultural resource site probability zones, a nearly 100% decrease in the amount of acreage open to unrestricted travel within each site probability zone (see Table 4.3.6). Based on the estimates for sites/square mile described above, approximately 10 sites may be present in these open areas and would continue to see impacts that may be already occurring (see Table 4.3.6). However, not all of these sites would necessarily continue to be impacted or would necessarily be newly impacted. The number of sites is also greatly reduced relative to Alternative D (No Action), which has approximately 2,700 sites within areas that are currently open to OHV travel.

Under Alternative B, multiple areas would have travel restricted to existing routes. Approximately 121,500 acres of land are located in or within 300 feet of either side of existing routes (see Table 4.3.7). This represents an approximately 25% reduction in open area overall relative to Alternative D (No Action), with an approximately 28% reduction in open area within high cultural resource site probability zones (see Table 4.3.7). Based on reasonable projections of numbers of sites within high and low probability zones, this alternative would potentially expose approximately 480 cultural resource sites to ongoing impacts or potentially new impacts. However, this number is approximately 27% lower than the nearly 660 sites that are currently potentially subject to impacts.

4.3.2.9.4. ALTERNATIVE C

Alternative C provides for the limitation of travel to designated routes for 1,353,529 acres of land currently open to unrestricted OHV travel, or a 99.5% decrease in areas open to travel. Approximately 240 acres would remain open to OHV travel in high cultural resource site probability zones and approximately 5,200 acres would remain open in low cultural resource site probability zones, a nearly 100% decrease in the amount of acreage open to unrestricted travel (see Table 4.3.6). Based on the estimates for sites/square mile described above, approximately 10 sites may be present in these open areas and would continue to see impacts that may be already occurring (see Table 4.3.6). However, not all of these sites would necessarily continue to be impacted or would necessarily be newly impacted. The number of sites is also greatly reduced relative to Alternative D (No Action), which has approximately 2,700 sites within areas that are currently open to OHV travel.

Under Alternative C, multiple areas would have travel restricted to existing routes. Approximately 115,700 acres of land are located in or within 300 feet of either side of existing routes (see Table 4.3.7). This represents an approximately 28% reduction in open area overall relative to Alternative D (No Action), with an approximately 32% reduction in open area within high cultural resource site probability zones (see Table 4.3.7). Based on reasonable projections of numbers of sites within high and low probability zones, this alternative would potentially expose approximately 455 cultural resource sites to ongoing impacts or potentially new impacts. However, this number is approximately 31% lower than the nearly 660 sites that are currently potentially subject to impacts under Alternative D (No Action).

4.3.2.9.5. ALTERNATIVE D (NO ACTION)

Travel decisions under Alternative D (No Action) are largely unspecified. No specific provisions exist for the repair, maintenance, upgrade, or realignment of roadways causing damage to resources. Designations do exist, however, for OHV use within the VPA under Alternative D (No Action). These designations provide the least protection to cultural resources of all the designations under the Proposed RMP and all alternatives. Under Alternative D (No Action) relative to the Proposed RMP and other alternatives, significantly more acres (787,859 acres) are open to unrestricted OHV use. Fewer acres (887,275 acres) are subject to restrictions on OHV use, and fewer acres (50,388 acres) are closed to OHV use. Based on the estimates of acreages and sites/square mile in high and low cultural resource site probability zones, under this alternative, approximately 2,750 sites are subject to potential new damage or to continuing damage from OHV use.

Under Alternative D (No Action), the largest number of travel routes and associated access areas would remain open. Approximately 161,500 acres of land are located in or within 300 feet of either side of existing routes (see Table 4.3.7). Based on reasonable projections of numbers of sites within high and low probability zones, this alternative would potentially expose approximately 660 cultural resource sites to ongoing impacts or potentially new impacts.

4.3.2.9.6. ALTERNATIVE E

Alternative E would have travel decisions similar to those proposed under Alternative C, with similar impacts on cultural resources: Open, cross-country OHV travel would be allowed on 5,435 acres; OHV Limited travel on designated routes would be allowed on 1,326,024 acres; and approximately 392,818 acres would be designated as Closed to OHV travel. Under this alternative, approximately 53 miles of OHV routes would be closed to travel in order to protect the wilderness values that lie within non-WSA lands with wilderness characteristics, which would have long-term, beneficial impacts on cultural resources by reducing the potential for OHV impacts to the resource along designated travel routes.

Approximately 240 acres would remain open to OHV travel in high cultural resource site probability zones and approximately 5,200 acres would remain open in low cultural resource site probability zones, a nearly 100% decrease in the amount of acreage open to unrestricted travel (see Table 4.3.6). Based on the estimates for sites/square mile described above, approximately 10 sites may be present in these open areas and would continue to see impacts that may be already occurring (see Table 4.3.6). However, not all of these sites would necessarily continue to be impacted or would necessarily be newly impacted. The number of sites is also greatly reduced relative to Alternative D (No Action), which has approximately 2,700 sites within areas that are currently open to OHV travel.

Under Alternative E, multiple areas would have travel restricted to existing routes. Approximately 113,079 acres of land are located in or within 300 feet of either side of existing routes (see Table 4.3.7). This represents an approximately 30% reduction in open area overall relative to Alternative D (No Action), with an approximately 35% reduction in open area within high cultural resource site probability zones (see Table 4.3.7). Based on reasonable projections of numbers of sites within high and low probability zones, this alternative would potentially expose approximately 438 cultural resource sites to ongoing impacts or potentially new impacts. However, this number is approximately 33% lower than the nearly 660 sites that are currently potentially subject to impacts under Alternative D (No Action).

4.3.2.9.7. SUMMARY OF TRAVEL DECISIONS

Alternatives E and C would have the greatest beneficial impacts on cultural resources because of the small areas designated as Open to OHV travel, followed by the Proposed RMP and then B. Alternative D (No Action) would have the least beneficial impacts on travel because approximately 787,859 acres would be managed for unlimited, cross-country OHV use. The large open OHV area under Alternative D (No Action) would increase the likelihood for direct and indirect, adverse, surface-disturbances to cultural resources.

4.3.2.10. IMPACTS OF VEGETATION DECISIONS ON CULTURAL RESOURCES

Vegetation decisions under the Proposed RMP and all alternatives are similar to those described previously for Fire Management. As the impacts of such decisions on cultural resources have already been described, they would not be reiterated here.

4.3.2.11. IMPACTS OF VISUAL RESOURCE MANAGEMENT DECISIONS ON CULTURAL RESOURCES

There are no measurable short-term or long-term direct effects on cultural resources resulting from visual resource management decisions. Significant impacts to cultural resources from visual resource management decisions under the Proposed RMP and all alternatives are direct and beneficial over the long-and short-term. These positive impacts are related to the restriction of surface-disturbing activities and limitations placed on land uses within areas of high VRM Class values. The reduction, control, or elimination of surface-disturbing activities, such as oil and gas development, OHV travel, mechanical vegetation treatments, prescribed fire, etc. within large geographic areas to preserve high VRM values affords significant protection to cultural resource sites and insures preservation of the important scientific, experimental, conservation, and traditional use values of these resources.

While a direct one-to-one correlation of acres disturbed to cultural resources encountered does not exist, relative ratios of higher numbers of acres disturbed to higher numbers of sites encountered and fewer acres disturbed to fewer sites encountered can be assumed. Thus, with the specific controls and restrictions placed on surface-disturbing activities in areas managed as the two highest VRM classes, the long-term net effect would be an overall decrease in the numbers of sites subject to impacts, including those resulting from mitigation where avoidance is not possible.

4.3.2.11.1. PROPOSED RMP

Under the Proposed RMP, 57,776 acres would be managed as VRM Class I, the highest level of VRM value and the one with the most limitations on the nature of surface-disturbing activities. Another 231,911 acres would be managed as VRM Class II, 786,612 acres would be managed as VRM Class III, and 643,641 acres would be managed as VRM Class IV, the least restrictive visual resource management class. Compared to the other alternatives, the Proposed RMP provides the fourth highest level of overall direct benefit to cultural (behind Alternatives C and E) as a total of 289,687 acres would be managed as the two highest VRM classifications. Visual resource management decisions under the Proposed RMP provide a greater benefit to cultural resources than do those under Alternatives B and D.

4.3.2.11.2. ALTERNATIVE A

Under Alternative A, approximately 63,136 acres would be managed as VRM Class I, the highest level of VRM value and the one with the most limitations on the nature of surface-disturbing activities. Another 294,773 acres would be managed as VRM Class II, approximately 716,186 acres would be managed as VRM Class III, and 868,542 acres would be managed as VRM Class IV, the least restrictive visual resource management class. Compared to the other alternatives, Alternative A provides the third highest level of overall direct benefit to cultural (behind Alternative C) as a total of 357,909 acres would be managed as the two highest VRM classifications. Visual resource management decisions under Alternative A provide a greater benefit to cultural resources than do those under Alternatives B and D.

4.3.2.11.3. ALTERNATIVE B

Under Alternative B, 52,764 acres would be managed as VRM Class I, and 114,030 acres would be managed as VRM Class II. Another 199,179 acres would be managed as VRM Class III, and 1,353,967 acres would be managed as VRM Class IV. Compared to the other alternatives, Alternative B provides the fifth greatest level of benefit to cultural resources with 166,794 acres managed as the two highest, and most restrictive, VRM classes. Visual resource management decisions under Alternative B provide a similar benefit as those under Alternative D (No Action) but less than those under the Proposed RMP and Alternatives A, C, and E.

4.3.2.11.4. ALTERNATIVE C

Under Alternative C, 145,781 acres would be managed as VRM Class I, and 362,660 acres would be managed as VRM Class II. Another 580,846 acres would be managed as VRM Class III, and 630,653 acres would be managed as VRM Class IV. Compared to the other alternatives, Alternative C provides the second greatest level of benefit to cultural resources with a total of 508,441 acres managed as the two highest, and most restrictive, VRM classes.

4.3.2.11.5. ALTERNATIVE D (NO ACTION)

Indirect effects of visual resource management decisions on cultural resources under Alternative D (No Action) would be substantially less than that described for Alternatives A, C, and E. As impacts to cultural resources are generally related to the level of surface and subsurface disturbance in a given area, the lower number of acres managed as either VRM Class I or VRM Class II under Alternative D (No Action) provides less protection to cultural resources within the VPA. Under Alternative D (No Action), 53,086 acres would be managed as VRM Class I, and 113,686 acres would be managed as VRM Class II. Another 199,192 acres would be managed as VRM Class III, and 1,353,976 acres would be managed as VRM Class IV. Compared to the Proposed RMP and all other action alternatives Alternative D (No Action) provides the lowest level of benefit to cultural resources with a total of 116,772 acres managed as the two highest, and most restrictive, VRM classes.

4.3.2.11.6. ALTERNATIVE E

Under Alternative E, approximately 331,913 acres would be managed under VRM Class I objectives, and 263,285 acres would be managed under VRM II objectives. Approximately 536,301 acres would be managed as VRM Class III, and 590,262 acres would be managed as VRM Class IV. Compared to the other alternatives, Alternative E provides the highest level of benefit to cultural resources with a total of 595,198 acres managed as the two highest, and most restrictive, VRM classes because VRM I and II would either prohibit or greatly restrict surface disturbances on the landscape in order to protect scenic quality. These prohibitions and/or restrictions would also be beneficial in the long term in preserving and protecting cultural resources from surface disturbances. Compared to Alternative D (No Action), this alternative would be more beneficial because it would manage 428,000 more acres under VRM I and II objectives.

4.3.2.12. IMPACTS OF WILDLIFE AND FISHERIES DECISIONS ON CULTURAL RESOURCES

Wildlife and fisheries decisions under the Proposed RMP and the various alternatives have negligible direct impacts on cultural resources within the VPA. Potentially significant impacts to cultural resources from wildlife and fisheries decisions under the alternatives are generally indirect, long-term, and beneficial. These positive impacts are related specifically to those decisions placing restrictions on surface-disturbing activities and limitations on land uses within areas of crucial deer winter range. The reduction or control of surface-disturbing activities, such as oil and gas development and OHV travel, within large geographic areas to preserve crucial deer winter range affords significant protection to cultural resource sites and insures preservation of the important scientific, experimental, conservation, and traditional use values of these resources.

It should be noted, however, that direct, long-term adverse impacts to cultural resources might occur from wildlife use of the Planning Area. These impacts are primarily related to the trampling of archaeological sites by herd animals such as wild horses, burros, and elk. These potential impacts would typically be comparable to those described for livestock grazing. Because of their particular herd behavior, wild horses may have a slightly greater impact on cultural resources by trampling, as evidenced by the higher level of vegetation damage and soil erosion noted in areas where wild horses congregate.

4.3.2.12.1. PROPOSED RMP

Under the Proposed RMP, new surface disturbance of up to 10% per township of crucial deer winter range would be allowed. Under the Proposed RMP, no more than 10% of such habitat would be subject to new and pre-existing surface disturbance and would remain un-reclaimed at any given time. This decision under the Proposed RMP provides greater benefit to cultural resources than do decisions under Alternative B but slightly less than decisions under Alternatives C and E. Similar decisions are unspecified under Alternative D (No Action). Potential adverse impacts on cultural resources from wildlife trampling would be comparable to those described for livestock for this alternative.

4.3.2.12.2. ALTERNATIVE A

Alternative A, new surface disturbance of up to 560 acres per township would be allowed and would be prorated based upon the percentage of the range within that township that functions as crucial winter range. Under Alternative A, the 560 acres represent new surface and subsurface disturbance over and above existing disturbance. This decision under Alternative A provides greater benefit to cultural resources than do decisions under Alternative B but slightly less than decisions under Alternative C. Similar decisions are unspecified under Alternative D (No Action).

4.3.2.12.3. ALTERNATIVE B

Under Alternative B, new surface disturbance of up to 560 acres per township would be allowed and would be prorated based upon the percentage of the range within that township that

functions as crucial winter range (same management action as Alternative A). As such, this alternative provides less net benefit to cultural resources than do Alternatives C and E, which limit total disturbance (new and existing) to 560 acres per township. Potential adverse impacts on cultural resources from wildlife trampling would be comparable to those described for livestock for this alternative.

4.3.2.12.4. ALTERNATIVE C

Under Alternative C, surface disturbance in crucial deer winter range would be capped at 560 acres per township (prorated based upon the percentage of the range within that township that functions as crucial winter range on BLM-managed land). This 560-acre cap includes both new and existing surface and subsurface disturbance. This decision under Alternative C provides greater benefit to cultural resources than do decisions under the other alternatives. Potential adverse impacts on cultural resources from wildlife trampling would be comparable to those described for livestock for this alternative.

4.3.2.12.5. ALTERNATIVE D (NO ACTION)

Wildlife and fisheries decisions related to surface and subsurface disturbance in crucial deer winter range are unspecified under Alternative D (No Action). Potential adverse impacts on cultural resources from wildlife trampling would be comparable to those described for livestock for this alternative.

4.3.2.12.6. ALTERNATIVE E

The impacts would be the same as Alternative C because the management decisions are the same.

4.3.2.13. MITIGATION MEASURES

All undertakings based on decisions set forth under the Proposed RMP and all alternatives analyzed herein for the VPA RMP are also subject to compliance with cultural resource laws, such as Section 106 of the NHPA, as well as internal agency guidelines. These laws and guidelines are intended to provide considered alternatives to eliminate, reduce, and/or mitigate adverse impacts to cultural resources. Although the preferred treatment of important cultural resources within an area of an undertaking is complete avoidance, this is not always possible. As such, mitigation of impacts is offered as an alternative to avoidance. While avoidance helps to preserve the physical archaeological record within an area, mitigation would result in the gradual elimination of the physical archaeological record and its conversion into a paper or archival record. It should be noted, however, that both the identification of sites and the mitigation of impacts through data recovery conducted in association with the Section 106 process for land uses has the positive impact of increasing the body of knowledge about past human behaviors and occupations in the Vernal Planning Area.

4.3.3. UNAVOIDABLE ADVERSE IMPACTS

Because the location and nature of all cultural resources in the area under consideration are unknown, it is not possible to determine if there would be unavoidable adverse impacts to cultural resources and/or what these impacts might be. There is some potential for unavoidable adverse impacts from nearly any proposed management decision. However, following the relevant cultural resource laws would provide opportunities for mitigation of many of these impacts.

4.3.4. SHORT-TERM USES VERSUS LONG-TERM PRODUCTIVITY

Because the location and nature of all cultural resources in the area under consideration are unknown, it is not possible to determine if there would be changes in short-term uses or long-term productivity of these resources.

4.3.5. IRREVERSIBLE AND IRRETRIEVABLE IMPACTS

Because the location and nature of all cultural resources in the area under consideration are unknown, it is not possible to determine if there would be irreversible and/or irretrievable impacts to cultural resources and/or what these impacts might be. There is the potential for impacts from nearly any proposed management decision. However, following the relevant cultural resource laws would provide opportunities for mitigation of many of these impacts.