
THE AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

The boundary of the Sand Hills MA is based on land status and management responsibility. For the most part, transportation systems extend beyond derived boundaries. Therefore, any changes to the transportation system would impact the area as a whole regardless of land ownership. To provide a fair assessment of the alternatives and to better understand the cumulative impacts, the analysis area extends approximately ½ mile beyond the boundary of the MA.

THE DEVELOPMENT ALTERNATIVE (A)

Alternative A would have the largest impact to the natural environment. This alternative maintains the most miles of linear disturbance and does not close any existing travel routes. This is the only alternative that provides additional motorized access points. The number of additional access points would depend on the number of requests. If all requests were granted, additional access points could include up to 25 new entry locations and would include an estimated 5 miles of new linear disturbance. These new routes would be connected to the closest existing road, follow fence lines and topographic features, and would be interconnected to other access locations. In some cases, these new primitive roads would not be the shortest distance between two points. Sensitive locations, such as areas containing unstable sands or important habitats, would be avoided whenever possible. These routes would be designed in such a manner as to create the least possible impacts to the natural environment. This alternative would increase the number of people with motorized access into the analysis area, but the area would remain inaccessible to the general public.

In addition to access points, new primitive roads may be authorized for development and maintenance of other allowable resource uses. This is common to all alternatives and provides for development of temporary or long-term motorized routes for maintenance of rangeland improvement projects (new water wells, fence line alterations) and existing oil and gas lease development. These routes would most often be temporary and would be reclaimed as soon as they are no longer needed. Appendix C includes the mitigation measures that would be included as part of the authorization process.

Soil and Vegetation Resources

The majority of private lands surrounding the Sand Hills MA are undeveloped. Motorized recreational use by those persons with access is limited. Travel on the existing roads and trails are primarily for livestock management and maintenance of rangeland improvement projects, with the exception of the routes located in and around the existing oil field. The majority of the primitive roads inventoried had some vegetative cover and showed only light to moderate use. Primitive roads that were considered to have light use had no apparent signs of motorized travel, while moderate use was identified on commonly used roads that were not main throughways. Even the more heavily used routes appeared to be in good condition. Only a few of the existing routes showed marked erosion or paralleling roads. The relatively stable condition of the existing transportation network is most likely a result of the seasons, levels, and types of motorized use. The privately controlled access restricts the number of users. Moreover, the existing routes are primarily used to manage livestock. Early spring and winter use is not common. Limiting motorized use during the spring

allows the native plant communities to establish within roadways that receive light to moderate use. This vegetative cover generally remains throughout the summer season. There is an increase in motorized use during the hunting season (September through November), when many of the private land owners use the area for private and commercial hunts. These seasonal traffic patterns mitigate vegetation loss and reduce the potential for erosion.

Transportation patterns would change as a result of implementing the Development Alternative (A) and would have an impact on both the stability of the soils and vegetation communities in the area. As people construct homes on private lands in the general area, the number of requests for motorized access would increase. This would result in an increased number of users and significantly broaden the scope of motorized use. Recreational use of the area would include non-motorized/muscled-powered (mountain biking, horseback riding) and motorized (ATV, motorcycles) trail riding. The circular travel routes that current exist would be the most popular routes and therefore be impacted the most by motorized use.

These types of recreational uses are popular throughout the spring and summer. Motorized use in the fall would increase substantially because of increased competition among hunters. Motorized winter use is also likely but reduced when compared to the rest of the year. Snowmobile use would be permitted but is limited by the available snow cover. The changes to the existing use patterns would redistribute traffic among all the existing routes. Primitive roads that are rarely used would become a more structured part of the transportation network. Lesser used primitive routes (ways), which by definition are protected by a vegetative cover, would be used into a more permanent existence. Year-long use would prevent vegetation from establishing on light to moderately used roads. Increased erosion would be likely and parallel roads would be established as certain areas become difficult to transverse. These increases in surface disturbance and vegetative losses would result in a significant impact to the existing environment.

If non-motorized access agreement was obtained, the use of horses and pack animals would increase over the current level, however, it would not be likely that substantial impacts would occur. Visitors to the area would generally remain close to the existing trail system. Even with some off-trail use, impacts from non-motorized activities would be minimal.

Cheatgrass and other invasive non-native plant species have flourished in several areas within the Sand Hills. This is especially apparent in the southwest corner of the management area where the majority of the new access points would be created and the potential for energy development would be the greatest. Impacts under this alternative include the increased distribution of invasive non-native species. Seeds would be carried throughout planning area by OHVs. These plants adapt to surface disturbance, often out-compete native plant species, generally have less nutritional value, and are difficult to eradicate.

Wildlife Resources

The Sand Hills MA represents the largest block of federally administered surface within the natural boundaries of the two existing big game herd units. Decisions 7047, 7048, and 7049 in the 2007 Casper RMP limit future development of this area. Existing leases would be developed with site-specific mitigation measures in order to control the potential for negative environmental impacts.

Sawyer et al. (2005) found that mule deer avoided otherwise suitable habitat within 2.7km of natural gas field development. This study further documented shifts of deer distribution to less preferred habitats. It is possible that development of existing oil and gas leases could also result in similar effects. Development of the magnitude and density documented during this study is not likely; however, similar results may occur from recreationists if several new access points were developed. Naugle et al. (2006) found like results with sage-grouse in the Powder River Basin. This study found that sage-grouse avoid developed areas, moving to adjacent undeveloped areas. It has also been documented that “boom town” areas experience more wildlife violations per capita than agrarian-based population centers (Berger 1988). If increased access were permitted, it is likely that wildlife law violations would increase substantially.

Rights-of-way, including access roads to federal leases, would be developed to the lowest possible safe standards in order to maintain existing vegetation communities. Disturbed areas would be reclaimed as quickly as possible and would be recontoured to follow the natural lines, helping to preserve the existing environment. Moreover, the area is administratively unavailable for new oil and gas leases. Other types of development have also been limited or otherwise excluded from the management area. These decisions are listed on page 2 under the Land Use Conformance and in appendix A. Even with these protective measures in place negative impacts to wildlife habitats would result from this alternative. Given the magnitude of surface-disturbing activities that have already occurred on private land in the vicinity, alternative A would increase the likelihood of habitat fragmentation.

This alternative would be contrary to the goals and objectives outlined for this area. Habitat fragmentation would result from a greater number of miles dedicated to the transportation system, the existence of well-established roads, higher erosion rates, and increased dispersion of invasive non-native plant species when compared to the other alternatives. Additionally, the analysis area has suitable habitat for the endangered blowout penstemon. Adoption of this alternative, the potential creation of up to 25 new access points, and changes in OHV use patterns could result in a “may affect” determination for this species.

Cultural Resources

Affects to cultural and paleontological resources under current management are moderate, and stem from open use of an extensive network of major and minor trails that have the potential to disrupt soil-stabilizing vegetation. In turn, the loss of vegetation promotes wind erosion thus disturbing shallowly buried cultural resources. Impacts to the Bozeman Trail will remain the same unless previously unused traces are added to the informal road network. As deep sand dunes cover paleontological resources over most of the MA, only the most extreme disturbance would extend deep enough to dislocate them.

Any new disturbance has the potential to affect sensitive cultural resources. New disturbances would most likely result from the development of existing leasing, potential rangeland improvement projects and potential new access routes described under this alternative. Since the soils are highly susceptible to wind erosion, even a small surface disturbance can result in disruption of a much larger area with resulting negative consequences for any cultural resources. The current plan is

intended to regulate off-highway vehicle use and should ultimately result in lowering the amount of surface disturbance.

Any action which might entail ground disturbance would be approved only after any necessary Sec. 106 compliance inventory and reporting is carried out. Should previously unknown cultural materials be discovered during any ground-disturbing activity, work in that vicinity shall cease until the Authorized Officer can be notified and a qualified archæologist can evaluate the find. If necessary, a treatment plan will be developed in consultation with the State Historic Preservation Office and, after all mitigation work is completed, the project may continue.

Paleontological Resources

Considering the low level of surface disturbance associated with a travel management plan, the likelihood of impacts to significant fossils is very limited. With implementation of the restrictions for OHV travel in the Sand Hills study area, potential for adverse impacts to no significant fossils is considered minimal. Possible damage would result from inadvertent exposure by means of earth moving equipment or off-road travel breaking the root mat and exposing easily erodible soils. Exposing fossil material could precipitate its weathering and make it visible for illicit collection, resulting in the loss of possibly important paleontological data.

The standard BLM paleontological material discovery stipulation applies to all projects. With implementation of the discovery measure prescribed below, no significant impact to important paleontological resources is foreseen.

If vertebrate paleontological resources (fossils) are discovered on land administered by the BLM Casper Field Office, any activity that could cause surface disturbance in that area shall be halted and the BLM Casper Field Office contacted immediately. The BLM Authorized Officer will arrange for evaluation of the find and determine the need for any additional actions which may be necessary.

Socioeconomics

A direct economic impact would result from this alternative. The impact would be localized, affecting only those private land owners that provide big game outfitting and guide services. These companies are successful because they have the unique opportunity to provide access to public lands that would otherwise be inaccessible. This area is desirable for hunters because competition between hunters is low compared to other public lands, and the area is well known for producing trophy game animals. Alternative A would provide additional motorized access to the Sands Hills, thus increasing competition among hunters and reducing the need for guide services. However, since the Sand Hills MA would remain inaccessible to the public, only a limited number of individuals would gain legal motorized access. Outfitting and guide services would still be the most desirable way to hunt this area.

Ranching is a long standing industry in the Sand Hills. All the alternatives provide reasonable accommodations for responsible grazing practices, including limited off-route travel in order to gather livestock. Alternatives B and C have specific routes with limited use in order to allow for maintenance of rangeland improvement projects. There would be only minimal impacts to the existing ranching operations and would improve herbaceous material available to livestock.

Alternative A would not have an impact on the boundary of the MA and would therefore not have an impact on any activities that would be authorized on public lands located in the extended boundary proposed in both the preferred alternative (B) and alternative C. The mitigation measures in appendix C would be applied to all surface-disturbing activities within the Sand Hills MA. Increased production costs resulting from the increased mitigation measures would be minor and would not likely affect energy development. No affect to county or state level economic systems are expected to result from this alternative.

The recent changes in land patterns have increased user conflicts. Many of the long-term land owners are genuinely concerned for the environment and the resulting impacts to their way of life. Historical land owners expressed a sense of loss with the development alternative (A). Many of these families have lived there for generations and see the landscape as an essential piece of their life style. They have expressed concern over the impacts of increased use of the Sand Hills. However, new land owners purchased properties for many of the same reasons as these original owners. Rural living, open space and access to public lands draw people to the area. Many of the newer landowners have expressed the desire to have a motorized access point from their individual parcel. Alternative A would entail the greatest degree of change to the existing social structure. This alternative would appease the new land owners but would serve to fuel the conflicts among the two groups. It is unlikely that agreements with landowners for non-motorized access points would be successful with the growing conflicts among user groups.

Recreation

The roaded natural recreation setting of the Sand Hills would shift as a result of changes in the transportation network, OHV use patterns, and increased development on private lands. As the rural developments on nearby private lands grow, the need for electricity, phone lines, and a well-maintained road network would follow, removing any sense of remoteness. Inside the management area, the natural landscape would still dominate the view; however, the well-established travel routes would detract from the view, and the need for management presence would increase. The current low profile signs would be replaced with larger informational kiosks. It is also likely that rangeland improvement projects and pasture fences would be signed by ranch managers on private parcels and on public lands depending on BLM approval.

The on-site presence of other people would be more obvious and motorized uses would not be restricted by designations of closures or limited use. Year-round use would be common with a dramatic spike seen during the hunting season. Deer hunting would remain the most popular recreational activity, and professional guides would remain the primary method for out-of-area hunters. However, the quality of the experience would be impacted. Spring and summer use would draw the attention of trail enthusiasts. Motorized OHV use would include ATVs, dirt bikes, and 4X4s. Horseback riding would be the favorite choice for the non-motorized user groups. Opportunities for solitude, self-reliance, and personal challenge would be nominal and interactions with other groups, commonplace. The recreation setting would be changed from roaded natural to roaded-modified. The need for law enforcement required to manage increased use would also increase substantially.

Off-Highway Vehicles

The environmental impacts resulting from changes in OHV use has been described previously for this alternative. Alternative A also creates new opportunities. Increasing the number of potential entrance points allows more people to explore and to better appreciate the unique ecosystem sustained by the Sand Hills. This alternative increases recreational opportunities and increases access potential. Moreover, the well established roads that would result from increased use could reduce the costs to leaseholders as they seek to develop energy-related resources.

Visual Resources

Changes to the overall transportation network would not affect visual resources to a level that would exceed the objectives set for the area. New visual intrusions would be from an increased contrast with the natural lines. The roads would draw the attention of the viewer and detract from the natural setting but would remain within the objectives set for VRM class IV, which allows visual intrusions to dominate the view.

The increased motorized OHV use on the primitive roads under this alternative would result in negative impacts to wildlife habitats, sensitive soils, cultural resources, and visual resources, as well as social and economic interests. Once impacted, these resources would be difficult to restore.

Under this alternative, the boundary of the management area is consistent with the current RMP, but it is not marked on the ground by indicators such as roads, streams, or fence lines. In addition, the BLM-administered lands within the analysis area would not be separated by State lands. It is likely that new primitive roads would continue to grow within these areas. Scoping comments suggest increasing the boundary as far west as County Road 705, as a way to help control access points and increase the probability of management success. This alternative would have the greatest need for law enforcement personnel.

THE PREFERRED ALTERNATIVE (B)

Preferred Alternative (B) would reduce negative impacts to the natural environment. This alternative would reduce the overall miles of linear disturbance and would allow continued motorized use of public lands within the planning area for current permitted users and members of the public with legal access. New motorized access points would not be authorized, and the total number of OHV users would remain near existing levels.

Motorized travel within the MA would be restricted to designated routes and designated uses. Motorized use on lesser used routes would be more restrictive. Specific routes used primarily to maintain rangeland improvement projects would be designated for authorized use only, helping to preserve and, in some cases, increase vegetative cover. The closure of unnecessary roads would increase vegetative cover; slow erosion rates, and reduce habitat fragmentation within a larger area.

Surface disturbing activities (e.g., road maintenance) would be evaluated in a separate site-specific NEPA document. New rights-of-way authorized for the development of existing leases would be approved at the lowest maintenance level necessary to protect soils and existing vegetation and would

use the designated transportation system to the greatest extent possible. Rights-of-way would be shared whenever possible and would be reclaimed when no longer necessary.

Soil and Vegetation Resources

This alternative would reduce the impacts to the natural environment when compared to alternative A. It maintains the integrity of the transportation network while closing many of the unnecessary routes. This alternative does not provide additional motorized access points. New linear disturbances would be limited to the development of existing leases and would be temporary. Non-motorized access agreements would be sought by the BLM.

OHV use would be limited to primitive roads designated open to motorized use. Limiting the number of primitive roads would funnel OHV use onto the designated open routes. The roads designated as open would become more developed over time. The increased vehicle traffic on these routes would result in soil compaction and would prevent vegetation from establishing within roadways. Vegetation cover would be non-existent and some increase in erosion rates would be expected. Maintenance would be required on some stretches of these roads to prevent blow-outs and parallel routes. Impacts that would result from increases in non-motorized recreational use would be minimal.

Designating routes as authorized use only would result in slight improvements over the existing conditions. Motorized use would be reduced on the primitive roads under this designation. Use would be sporadic and seasonal as the routes would be used only when necessary to maintain fences and other rangeland improvement projects. Travel on many of these routes would not be required on an annual basis, and some minor travel routes may receive several years of rest. Seasonal use and rest periods would be conducive to healthy plant communities. The vegetative cover would mitigate the potential for erosion. Closing routes would further benefit soils, vegetation, and wildlife habitat.

Cheatgrass and other invasive non-native plant species have flourished in several areas within the Sand Hills. This is especially apparent in the southwest corner of the management area where the majority of users would enter the Sand Hills MA. Potential for distribution of these species would be greatest within 300 feet of primitive roads where OHV users are allowed to retrieve game. Other areas may also be affected to a lesser extent. These plants are adapted to surface disturbance, often out-compete native plant species, generally have less nutritional value, and are difficult to eradicate. The preferred alternative (B) would decrease distribution of these invasive non-native species when compared to alternative A.

Wildlife Resources

The Sand Hills MA represents the largest block of federally administered surface within the natural boundaries of the two existing big game herd units. Decisions 7047, 7048, and 7049, in the 2007, Casper RMP limit future development of this area. Existing leases would be developed with site-specific mitigation measures in order to control the potential for negative environmental impacts. Rights-of-way, including access roads to federal leases, would be developed to the lowest possible safe standards in order to maintain existing vegetation communities; disturbed areas would be

reclaimed as quickly as possible and would be recontoured to follow the natural lines, helping to preserve the existing environment. Moreover, the area is administratively unavailable for new oil and gas leases. Other types of development have also been limited or otherwise excluded from the management area (appendix A). With these protective measures in place, the Sand Hills MA would have a reduced potential for habitat fragmentation when compared to private lands in the same vicinity.

Preferred alternative (B) would provide additional protective measures which would decrease the risk of habitat fragmentation. No new access roads would be constructed. New linear disturbances would be limited to the development of existing leases, and approximately 8 miles of existing routes would be closed. This alternative would reduce impacts to wildlife habitats while maintaining some existing travel routes. Travel along these routes would be restricted as designated. The impacts to wildlife would be similar to those discussed in alternative A, although comparatively less under this alternative.

Preferred alternative (B) allows travel only on designated existing routes, no new access routes would be constructed, and surface disturbing activities (e.g., road maintenance) would be evaluated in a separate site-specific NEPA document. Therefore, this alternative would have a “no effect” on the endangered blowout penstemon.

Cultural/Paleontological Resources

Under the preferred alternative (B), threats to cultural and paleontological resources would be less than those under alternative A, as no new access points would be allowed and travel would be restricted as designated. Apart from roads related to authorized activities, such as oil and gas production, few new roads would be expected thus reducing the potential for primary disturbance (e.g. from construction). Traces of the Bozeman Trail are closed to vehicular travel. Secondary disturbance in the form of wind erosion would be reduced. As deep sands cover paleontological resources over most of the MA, only the most extreme disturbance would extend down far enough to dislocate them.

Socioeconomics

No direct economic impact would result from the preferred alternative (B). Private land owners authorized to provide big game outfitting and guide services would see very little change from this alternative. The number of access points is the primary factor affecting the social economic resources of the area. Under this alternative, additional access points would not be authorized. However, BLM would seek to obtain a right-of-way agreement across private land to allow non-motorized access to the Sand Hills MA. If successful, the BLM would construct a trail head and parking area on the public land near the access location. This should not increase competition among hunters and guide services. Outfitting and guide services would still be the most desirable way to hunt this area. The most successful companies would also provide access to the large parcels of private lands in the area.

The preferred alternative (B) includes the RMP amendment that increases the size of the Sand Hills MA. The amendment is limited to transportation management and does not affect the development

of non-renewable resources such as oil, gas, or other mineral materials. The RMP decisions for the Sand Hills Management Area would not be carried over into the proposed expanded transportation boundary. The RMP amendment described under both the preferred alternative (B) and alternative C would apply only to transportation and OHV use within the Sand Hills Management Area as described in the proposed Sand Hills CTTMP.

The mitigation measures described in appendix C would be implemented during the authorization process and would be applied regardless of the alternative chosen. Increased production costs resulting from the increased mitigation measures would be minor and would not be expected to affect energy development. No affect to county or state level economic systems are expected to result from this alternative. Indirect economic impacts would be localized and would result from damage to range lands. This impact is harder to estimate but tends to be more long-term.

User conflicts have increased in this area because of recent changes in land ownership patterns and are described under the –Socioeconomic” section of alternative A. Preferred alternative (B) would reduce the environmental impacts, mitigating tension between hunters and outfitters. However, new private land owners would not receive the motorized access requested during the scoping process. Agreements with landowners for non-motorized access points are more likely to be successful under this alternative.

Recreation

The current recreation opportunity spectrum (ROS) category for the entire the Sand Hills MA has been identified as roaded-natural. As rural developments on nearby private lands grow, the need for electricity, phone lines, and a well-maintained road network would follow, removing any sense of remoteness. However, inside the MA the natural landscape would still dominate the view. A natural appearing setting would be seen from the main corridor. Other designated routes would remain relatively the same in appearance and would detract from the view. Management presence would be low, with some increase in the number of signs.

The on-site presence of other people would remain at current levels; motorized-uses would be derived from the routes designated as open. Deer hunting would remain the most popular recreational activity, and professional guides would remain the primary method for out-of-area hunters. A spike in motorized use would occur during the hunting season. However, if walk-in access was obtained, spring and summer use would draw the attention of trail enthusiasts and horseback riding. Opportunities for solitude, self-reliance, and personal challenge would be moderate and interactions with other groups, commonplace. The recreation setting on public lands would remain unchanged even as the scope of the opportunities are broadened. Some nearby privately owned parcels would shift from a roaded-natural to a roaded-modified recreational setting.

Off-Highway Vehicles

The majority of changes that would result from this alternative have been previously described. The number of OHV users, types of OHV use, and distinct variations in travel patterns would have a nominal impact to the natural resources.

Successfully negotiated right-of-way agreements for non-motorized access would not result in changes to the overall traffic patterns within the Sand Hills MA. However, gaining legal access for the general public would broaden the scope of recreational use when compared to the existing conditions.

Visual Resources

Changes to the overall transportation network would not affect visual resources to a level that would exceed the objectives set for the area. New visual intrusions would be from increased contrast with vegetation color. Well-developed roads would draw the attention of the viewer in many circumstances but would not detract from the natural setting. No new visual intrusions would be created. Closed routes and those that are limited to authorized use only would tend to blend with the natural environment, reducing their contrast to the existing landscape.

The boundary of the MA as described for preferred alternative (B) is not consistent with the Casper RMP. This would be addressed with a plan amendment. The new boundary would be easier to enforce as it is clearly marked by fence lines. Moreover, BLM-administered surface interspersed with State lands are included within the analysis area. This alternative is likely to slow the creation of new primitive roads within the area. It is also more in line with scoping comments that suggest increasing the boundary in order to control access points and increase the probability for management success.

THE PRESERVATION ALTERNATIVE (C)

This alternative would result in positive impacts to the natural environment. However, it would not provide equal access to public lands for each of the current grazing lessees and permitted outfitters. No new motorized access points would be authorized, and the total number of OHV users would remain at existing levels. The likelihood of successfully obtaining agreements for non-motorized public access would be difficult to predict.

New routes would be authorized for the development and maintenance of other authorized uses. The impacts of these routes would be similar to those described for the preferred alternative (B).

Soil and Vegetation Resources

OHV use would be limited to primitive roads designated open to motorized use. Limiting the number of primitive roads under this designation would funnel OHV use onto designated open routes of travel. These roads designated as open would become more developed over time. The increased use along these routes would impede vegetation from establishing within roadways. Vegetation cover would be non-existent on these main routes, and erosion rates would be expected to increase. Maintenance would be required on some stretches of these roads to prevent blow-outs and parallel routes. Impacts that would result from increases in non-motorized recreational use would be minimal.

Designating routes as authorized use only would result in slight improvements over the existing conditions. Motorized use would be reduced on the primitive roads under this designation. Use

would be sporadic and seasonal as the routes would only be used when necessary to maintain fences and other rangeland improvement projects. Travel on many of these routes would not be used on an annual basis, and some minor routes may receive several years of rest. Seasonal use and rest periods would be conducive to the healthy plant communities. The vegetative cover would mitigate the potential for erosion. The benefit to soils, vegetation, and wildlife habitat by closing routes is greatest under this alternative.

Cheatgrass and other invasive non-native plant species have flourished in several areas within the Sand Hills. This is especially apparent in the southwest corner of the planning area where the majority of new users would enter the Sand Hills MA. Potential for distribution of these species would be greatest within 300 feet of primitive roads that would be open to motorized use. Alternative C reduces the potential for dispersal of this species when compared to all other alternatives as it reduces the number of OHV users within the MA. This would be most apparent in the northeastern portions of the planning area, as there are no connective routes.

Wildlife Resources

The Sand Hills MA represents the largest block of federally administered surface within the natural boundaries of the two existing big game herd units. Decisions 7047, 7048, and 7049, in the 2007, Casper RMP limit future development of this area. Existing leases would be developed with site-specific mitigation measures in order to control the potential for negative environmental impacts. Rights-of-way, including access roads to federal leases, would be developed to the lowest possible safe standards in order to maintain existing vegetation communities; disturbed areas would be reclaimed as quickly as possible and would be recontoured to follow the natural lines, helping to preserve the existing environment. Moreover, the area is administratively unavailable for new oil and gas leases. Other types of development have also been limited or otherwise excluded from the management area (appendix A). With these protective measures in place, the Sand Hills MA would have a reduced potential for habitat fragmentation when compared to private lands in the same vicinity.

General motorized travel would be limited to specific primitive roads and would be restricted to those with legal access to designated routes within the area. This alternative would greatly restrict motorized travel in the area. Upgrades of designated roads would reduce soil erosion. Limiting use on certain routes to authorized personnel only would help to preserve, and in some cases increase, vegetative cover along fence lines and access routes used primarily for maintenance purposes. An increased number of road closures would be required and would result in increased vegetative cover and reduction of habitat fragmentation. Alternative C would provide greatest protective measures, would decrease the risks of habitat fragmentation and would do the most to benefit wildlife habitats.

This alternative proposes upgrading major access routes. A portion of the upgrades would occur within potential habitat for the endangered blowout penstemon. Therefore, this alternative ~~may~~ "affect" the blowout penstemon, and consultation with the FWS would be required.

Cultural/Paleontological Resources

Impacts to cultural and paleontological resources would be lower than those described for alternatives A and B, as the number and lengths of travel routes would be more limited in this alternative. Fewer access points would result in less surface disturbance thus lowering the potential to disrupt known and unknown cultural resources. Restricting travel on primitive roads would help ensure the vegetative cover remains intact, which is the most effective means to reduce wind erosion. Physical evidence of the Bozeman Trail would be closed to vehicular traffic.

Paleontological resources are relatively immune to surface disturbance since the bulk of the MA is covered in æolian deposition, and the fossil materials are protected. Where natural erosion or project disturbance extends to bedrock, fossils may be exposed to weathering or other destructive forces. Under this alternative, the probability of this occurring is reduced.

Socioeconomics

Economic impacts could result from this alternative. The impacts would be localized, affecting only those private land owners that provide big game outfitting and guide services. The number of access points is the primary factor affecting the socioeconomic resources of the area. Under alternative C, the additional access points would be from walk-in access only. General motorized travel would be limited to specific roads, none of which cross the entire area. Anyone who currently has motorized access would have access to the MA, but it would not be equal for all users. Competition and conflicts among existing permit holders may increase slightly as a result. Increased production costs resulting from the increased mitigation measures would be moderate and would not significantly affect energy development. This alternative is not likely to affect county or state level economic systems.

User conflicts have been described under the –Socioeconomic” section of alternative A. Alternative C would result in increased tension among the two groups as new private land owners would feel excluded from full access to the area. Moreover, new land owners would have other options to negotiate access into the planning area.

Recreation

The current ROS category for the entire the Sand Hills MA is roaded-natural. The impacts to recreational resources in the area are similar to those described under the preferred alternative (B). As the rural developments on nearby private lands grow, the need for electricity, phone lines, and a well maintained road network would follow, removing any sense of remoteness. However, inside the MA the natural landscape would still dominate the view. A natural appearing setting would be seen from the designated open routes. Other designated routes would remain relatively the same in appearance and would detract from the view. Closed roads would improve the natural landscape. Management presence would be low, with some increase in the number of signs.

The presence of other people would remain at current levels, and motorized uses would be from the designated open routes. Deer hunting would remain the most popular recreational activity, and

professional guides would remain the primary method for out-of-area hunters. Spikes in motorized use would occur during the hunting season. However, if walk-in access was obtained spring and summer use would draw the attention of trail enthusiasts. Horseback riding would be the favorite choice for the non-motorized user groups. These types of recreational uses are popular throughout spring and summer. Opportunities for solitude, self-reliance, and personal challenge would be moderate and interactions with other groups likely. The recreation setting on public lands would remain unchanged even as the scope of the opportunities are broadened. Some nearby privately owned parcels would shift from roaded-natural to a roaded-modified recreational setting.

Off-Highway Vehicles

The environmental impacts resulting from changes in OHV use has been described in the previous sections for this alternative. Alternative C strives to mitigate impacts to the natural environment. Reducing the number of primitive roads along with well-developed mitigation measures does not fully protect this unique ecosystem, but it does temper the impacts that would otherwise occur. Moreover, this alternative increases recreational opportunities and expands non-motorized access. The transportation network designated by this alternative provides minimal access for management of resources in the area. All valid and existing rights are maintained with a moderate increase in production costs to lease holders as they seek to develop energy-related resources.

Visual Resources

Changes to the overall transportation network would benefit visual resources. Many of the existing visual intrusions would be mitigated. Closed routes and those that are limited to authorized use only would tend to blend with the natural environment, reducing their contrast to the existing landscape.

The boundary of the Sand Hills MA as described for alternative C does not conform to the Casper RMP. However, it is clearly marked on the ground by fence lines. Moreover, it includes BLM-administered surface divided by State lands within the analysis area. It is likely to reduce the creation of new primitive roads within the area. This alternative is more in line with scoping comments that suggest increasing the boundary in order to control access points thus increasing the probability of management success. The boundary change would require an amendment to the Casper RMP.

CUMULATIVE IMPACTS

The development alternative (A) does not provide the minimal environmental protections required to meet BLM objectives for the Sand Hills MA. While, the preservation alternative (C) meets resource objectives, it would not provide adequate access to current users and would be cost prohibitive. Therefore, these alternatives will not be analyzed further. This section of the document focuses on the preferred alternative (B) which strives to balance resource objectives with users needs.

Soil Resources

The soils within the analysis area are highly susceptible to wind and water erosion and any disturbance to vegetative communities would increase the potential for blow-outs and loss of top

soil. Cross-country motorized travel damages vegetative cover, while shifting sands can also result in loss of forage as plant communities are buried. Limiting motorized travel to designated routes would reduce the scope of the impacts related to OHV use within the analysis area.

Many of the primitive roads that would be limited to authorized use only currently have vegetative cover. Restricting use of these routes would reduce the potential for damage to plant communities and would allow for some natural revegetation. Road closures would have the greatest benefit to soils and plant communities.

The implementation of the preferred alternative (B) would benefit natural resources on public lands within the analysis area. It would have a minimal benefit to lands administered by agencies and land owners other than the BLM. Some road closures on public lands would result in roads and trails on state and private lands being unviable; some natural revegetation would occur.

Vegetation Resources

Livestock grazing would continue within the Sand Hills and has the greatest potential to affect natural resources. No other single authorized land use has the potential to benefit or to negatively impact natural resources to the same degree. Vegetation communities within the Sand Hills are highly susceptible to grazing practice. Nothing within the proposed alternatives would effect change in these practices.

Non-native invasive plant species have the potential to change the entire composition of plant communities. Annual plants such as cheatgrass are well adapted to the natural fire regime and tend to override native species. These non-native plants are commonly distributed throughout areas by OHVs. Limiting motorized travel reduces the spread of these species.

The reestablishment of native plant species is extremely difficult in this environment. However, in areas when continual disturbance by OHV use is removed, native and non-native annual species would eventually stabilize soils. Over time, perennials that are more productive would replace many of these species thus increasing the quality of wildlife habitat.

Water Resources

No long term or cumulative impacts to water resources are expected from the preferred alternative.

Wildlife Resources

The preferred alternative (B) for the Sand Hills CTTMP would have very little impact on the existing wildlife habitats. Wildlife habitats are far more likely to be impacted by activities such as oil and gas, housing, and wind energy development. Many of these activities would occur on private lands and are outside the scope of this project. In the long term, the public surface in the Sand Hills MA would provide open space and important vegetation communities that may be lost to housing construction and long term development projects such as wind farms on the surrounding private lands.

Cultural/Paleontological Resources

Due to limited access, there are a fixed number of OHV users within the Sand Hills planning area. Moreover, the preferred alternative (B) would not result in new travel routes or disturbances without additional NEPA documentation. Therefore, additional detrimental impacts to cultural or paleontological resources would not result from the implementation of this plan. Existing erosion would continue to degrade cultural resources, although it is likely that limiting the spread of new roads and trails would help to preserve undiscovered artifacts.

Socioeconomics

The preferred alternative (B) maintains a transportation system which allows for the management of renewable and non-renewable resources within the analysis area. All existing rights are protected in order to allow lease holders to develop their existing holdings. Mitigation measures serve to protect the quality of ecotourism opportunities and would not result in long-term negative impacts to the social economics of the analysis area.

Recreation

The preferred alternative (B) expands opportunities for non-motorized recreational activities. Additional access is common to all alternatives and depends on agreements with private landowners being met. It is unlikely that the preferred alternative (B) would have any significant impact on public recreational activities in the area.

The only increases in motorized use in the long term would result from private land owner agreements in which the land owners association obtains access to one of the designated egress points along the boundary. If this type of agreement was reached, motorized and non-motorized use would continue to be limited to designated routes but the scope of use and seasonal transportation patterns would change, having limited impacts to the natural resources within the Sand Hills MA. The recreational setting is unlikely to have a significant shift because of the CTTMP.

Visual Resources

The preferred alternative (B) would have a slight beneficial impact to visual resources from road closures. The cumulative benefits are derived from the preservation of open space. As private lands are developed, the majority of public lands within the Sand Hills MA would remain undisturbed and provide a natural appearing landscape.

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