



ALTERNATIVE A: PREFERRED ALTERNATIVE

Impacts on Air Quality

The leasing and development of the Great Falls Coal Field could affect the air quality of the area. Dust from coal development would degrade the present air quality. Formation of acid precipitation due to the interaction of particulate matter with water vapor could also occur if a coal burning plant were built in the area.

Dust from oil and gas development activities, such as the construction of pumping stations and pipelines, could also have short-term impacts on air quality. In addition, the flaming off of gas at the well head would have some impact on air quality. Long-term impacts would occur if a refinery were built in the area.

Impacts on Soil and Water Resources

By far the greatest impact to soils from timber harvesting, oil and gas exploration and development, mineral exploration and development, utility and transportation corridors, and coal leasing is the construction and use of roads. During the construction phase, the excavation of soil from its natural position alters the natural drainage of slopes and exposes soil to the elements. On steeper slopes, a cut at a critical point can trigger landslides. Roadside cut and fill slopes are bare erodible watersheds that increase sediment and drainage problems. Fills add weight to the underlying soil mass, and on steep hillsides they can also

trigger landslides or slip failures. The added weight of fill material on faulty foundations can also result in slumps and settlements.

The construction and use of roads and trails will also cause compaction. Compaction of the soil by vehicles and heavy equipment severely limits root penetration, air and moisture infiltration, and vegetative growth. The amount of compaction will vary depending on the soil and its associated moisture content at the time of compaction. On most soils, compaction will decrease the infiltration rate, which in turn increases runoff. This accelerates erosion and creates rills and gullies.

Livestock use also causes soil compaction directly and indirectly. Trampling by livestock is a direct cause of compaction. Under the moist soil conditions normally encountered during spring runoff, even light trampling can effectively compact the soil.

Compaction caused indirectly by livestock occurs when exposed soils on overgrazed ranges are subject to rainfall impact. The beating action exerted by rainfall on bare soils seals the soil surface. This causes reduced infiltration, resulting in increased runoff and erosion.

Wind and water erosion can be a problem on many soils in the Rocky Mountain Front area. The erosion problem will occur when the areas are further disturbed by road and drill pad construction. Such areas will be more susceptible to erosion because of the increased area of bare soil. Soils that now show symptoms of erosion will be seriously impacted by any soil-disturbing activities. Rehabilitation of these soils will be more difficult because of past losses of topsoil and nutrients.

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Trampling displacement is a form of erosion similar to water erosion. Like water erosion, trampling displacement is more evident as slopes increase. This form of erosion occurs most readily when the soil is very wet or very dry.

When plant cover is greatly reduced, either by grazing or other factors, sheet, rill, gully, and wind erosion are usually apparent. This results in a further loss of vegetative productivity as well as offsite sedimentation damage.

To reduce erosion, grazing systems that incorporate rest are more effective than annual season-long use. If livestock grazing were eliminated or substantially decreased, plants would initially respond with increased vigor, resulting in increased ground cover. This would reduce bare ground and erosion potential.

In timber harvesting, the type of harvest practice and method of yarding has a great deal of influence on the amount of erosion that may occur. Clear-cutting, for example, can have the greatest detrimental impact on soils because of the substantial decrease in ground cover, which increases the potential for accelerated erosion. Clearcutting also increases the opportunity for landslides on noncohesive soils. Selective cutting, where a substantial number of trees are left, can have the least amount of impact on soils.

The method of yarding influences the amount of roads that must be built, as well as the number of skid trails and the amount of soil damage on each skid trail. The aerial yarding system has the least impact on soils, whereas yarding systems that drag logs over the soil have considerably higher detrimental consequences. Ruts are created and compacted, and channel runoff downslope. This increases the opportunity for rills and gullies. Motorcycle use also creates ruts that channel runoff and increase erosion.

Motorized vehicle impacts will be similar to those caused by motorcycle race events. However, the slopes would probably not be as steep. The susceptibility of the soils to move is a prime consideration for determining impacts.

Mine tailings could be another area of concern. These bare soils will naturally erode, thereby increasing sediment loads into any nearby creeks or intermittent drainages. Aside from the erosion aspect, toxic substances are occasionally brought to the surface and could make the soil around the tailings pile sterile. The more toxic tailings erode, the larger the area of possible sterilization. This impact would persist until the toxic materials were leached below root depth or until the area was rehabilitated.

Reserve and waste pits will be built near each oil and gas well to contain drilling muds and formation fluids. Such construction activities could affect slope stability in steeper areas. Additional slope failure and slumping could be induced by saturation from fluids or overloading by heavy equipment.

Oil spills, although not frequent, can occur on a site specific basis from time to time. Oil may seep into pits, berms, drainages, or low areas around wells. Permeable soils will be the most severely affected by oil seepage because they will allow the deepest oil penetration.

Fluids brought to the surface may be toxic to vegetation and act as soil sterilants. These toxic materials may persist for several years until they are broken down or leached from the soil profile. These sterilized areas will be conducive to accelerated erosion.

Those areas stipulated for no surface occupancy will have no impacts on soils from oil and gas development. Seasonal stipulations that would restrict development activities to periods when the soils are sufficiently dry or frozen and snow covered will reduce the detrimental effects of soil compaction.

Under this alternative, the BLM would try to prevent, rather than mitigate the degradation of water quality. By reviewing activities before they happen, and following applicable laws and regulations, the water resources would benefit from the adoption of this alternative.

Water resources could be impacted by sediment from the development and rehabilitation of roads, pipelines, drilling pads and reserve pits. ORV use could decrease ground cover and infiltration, which in turn increases sediment. Failure of a reserve pit, or a blowout, with a corresponding oil spill would constitute a worst case impact.

Underground mining of coal could disrupt the groundwater required in the area by dewatering the area down to the depth of mining. At times, the coal seam will be an aquifer. If such an aquifer is disrupted by mining, both the quality and quantity of groundwater supplied to streams will be affected. Changes in groundwater flow patterns and an altered water table can also result from mining (USDA, FS 1980c). Water quality can also be adversely affected by water percolating through mine spoils or mineral surfaces. Impacts would also occur during development of a mine site and service roads.

In addition, a leakage of cyanide into the groundwater of the Helena valley could result in a serious impact on water resources, especially since many homeowners use the Helena aquifer as the source for their domestic water.

Impacts to water resources on allotments would be positive, since these areas would be developed for greater forage production and greater livestock distribution. Allotment management plans that are beneficial to riparian habitat would also benefit the water resource. Increased ground cover would improve general watershed condition in the long term. Overall there will be about a 2,000 acre decrease in unsatisfactory watershed condition.

Short-term impacts (5 to 10 years) on water resources from timber harvesting would be an increase in sediment and possibly an increase in water yield. These impacts would decrease as revegetation occurred. Long-term impacts would occur where roads were left in place after harvesting.

Any exposure of streams to sunlight as a result of clearcutting would mean an increase in the temperature of the water running through the exposed section. The removal of streambank vegetation also increases the chance of overland flow reaching the stream unimpeded. Leaving buffer strips shades the stream and also protects channel banks and streambeds during logging. See Appendix C for best management practices adopted by the BLM.

Transfer of land parcels from one owner to another would also mean a transfer of water rights to the new owner.

Outstanding Natural Area designations along the Rocky Mountain Front, and ACEC designation for the Sleeping Giant area, accompanied by no surface occupancy stipulations to protect natural values, will result in reduced surface disturbance and fewer impacts to soil and water resources. The effects of special designations are essentially identical to the effects of wilderness designation; however, special designations would presumably provide less secure protection because they are administrative, not legislative.

Conclusion

In general, impacts to soil and water resources can be mitigated on a site-specific basis through the application of standard operating procedures and the general best management practices listed in Appendix C.

Road construction and use from oil, gas, and coal developments and timber harvesting probably constitutes the most significant impact of this alternative on soil and water resources. Erosion and the resulting sediment originating from the road network would be the most costly in terms of downstream, offsite costs. Onsite reductions of vegetative productivity would be significant if mit-

igating measures failed. There will be approximately a 2,000 acre decrease in unsatisfactory watershed conditions from the current situation based on changes in grazing allotment management. This decrease is probably insignificant.

Impacts on Energy and Minerals

This alternative allows occupancy in the RMF on 85,660 acres (72%) of the 118,250 acres administered by the BLM. Leases would be issued with no surface occupancy stipulations on 14,040 acres (12%). In addition, surface occupancy may be prohibited on steep slopes and adjacent to surface water through the application of the standard stipulations contained in the Butte District Oil and Gas EA. A rule of thumb is that oil and gas resources over one-half mile from a drill site probably cannot be drained without directional drilling. Directional drilling in structurally complex areas is unproven and we have assumed it is not feasible in our assessment of environmental impacts. Therefore, if no surface occupancy areas are over one-half mile wide, the area more than one-half mile from an occupancy site is not leased, since the feasibility of developing oil and gas from beneath it is poor. In some cases of extreme topography, this distance is reduced to one-quarter mile. Based on this rule of thumb, leases would be denied in the core of some no surface occupancy areas. This acreage amounts to 18,550 acres (16%).

Because of the high potential for natural gas in the Rocky Mountain Front, designation of the four outstanding natural areas (ONAs), accompanied by no surface occupancy stipulations to protect natural values, may have a serious impact on natural gas exploration and production. These designations will result in approximately 1,000 acres being unavailable for oil and gas exploration and development. ONA designation is an administrative action and as such, is more flexible and less permanent than congressional designation as wilderness. Thus, in the event that natural gas potential becomes more important than the protection of various natural values, ONA designation is more easily altered to favor the exploration and production of natural gas. In addition, hardrock mining is not prohibited in ONAs, so there would be little impact on activities associated with it.

If tracts of federal surface are disposed of, potential problems with split estate ownership can be created. While these problems do not affect the availability of the land for mineral exploration, they may make exploration more complicated, more time consuming, and/or more expensive.

If travel restrictions are imposed in the Scratch-gravel Hills and Limestone Hills, mining claimants

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who are planning exploration operations might be required to file a plan of operations under 43 CFR 3809 instead of a notice (which is much less detailed). This is most significant in the Scratch-gravel Hills because of their higher mineral potential.

This alternative would have virtually no adverse impacts on the availability of federal coal for exploration and development. Through the application of the coal unsuitability criteria (see Appendix H) approximately 1,755 acres would not be available for the location of surface facilities. This acreage would have an insignificant impact on recovery of the coal resource.

Conclusion

Mitigating measures have been incorporated into the proposed action, which also incorporates measures developed in the Butte District Oil and Gas Environmental Assessment. The production and use of coal, oil, gas, and other minerals is an irreversible commitment of natural resources. To the extent that these resources are developed under this alternative, there will be an irreversible and ir retrievable commitment of resources.

The short-term impacts of this alternative are limited. Much of the area is already leased for oil and gas, and coal, oil and gas, and other minerals will generally be available as demand dictates. The long-term impact may be the loss of potential production from areas in the Rocky Mountain Front that have high potential for natural gas. Coal, oil and gas, and locatable minerals would generally continue to be available as demand dictates, except for some areas on the Rocky Mountain Front.

Impacts on Lands

This alternative would result in a more active land tenure adjustment program than at present. Both sales and exchanges would increase in volume. It is unlikely that any acquisitions by purchase would occur due to budgeting constraints.

There are certain generic impacts created by disposal and acquisition actions regardless of the method used to carry out the transaction (see Tables 4-1 and 4-2). The main benefit of exchange is that it tends to balance the impacts of disposal with those of acquisition, and by regulatory requirement, should result in a net increase in the public values. Only the impacts of disposal are associated with sale.

There is no past example of a large scale attempt to dispose of isolated tracts of public land under the fair market value requirements of FLPMA.

However, most of the isolated tracts in the disposal zone were left out of past patent applications because of such physical characteristics as steep slopes, rock outcrops, etc., that minimized their value for agricultural use. Now, most of these tracts are too isolated and inaccessible for commercial or residential use. As a result, it is unlikely that more than 50% of the land meeting disposal criteria could actually be sold or exchanged. There is also a high probability that there will be a higher demand for disposable tracts located in the retention zones than for tracts in the disposal zones. This is because the tracts in the retention zone tend to be closer to towns and residential areas. Therefore, a large scale, rapid, land tenure adjustment program is unlikely. It is more likely that such a program will be a gradual long-term process.

Disposal of all suitable tracts within the resource area would be unlikely to cause any significant impact to public land resource values or to the local economies. The only potentially significant impacts would be to individual land users or owners of land adjacent to, or surrounding, disposal tracts. Property taxes and payments in lieu of taxes (PILT) would also be affected to some extent.

Emphasis on sale would reduce the potential for future land acquisitions by depleting the stock of land available for future exchanges. This could result in a less desirable final ownership pattern than relying primarily on exchange.

Conclusion

To avoid unnecessary hardships on current land users, or surrounding and adjacent land owners, modified competitive bidding procedures or even direct sale (noncompetitive) can be considered over open public competitive sale procedures.

Using exchange as the primary method of disposal, with sales only being used when necessary, will assure an optimum final land ownership pattern.

Sale often offers a simpler, quicker method of disposing of land, but decreases the long-term potential for a desirable land ownership pattern by depleting the stock of land available for future exchanges, while achieving only half of the desired results; the disposal of undesirable tracts.

Although any land tenure adjustment action could technically be reversed, for all practical purposes such actions should be considered as irreversible.

The only remaining potentially significant negative impact would be the possible economic hardships on current users and surrounding and adjacent owners.

**TABLE 4-1
IMPACTS FROM DISPOSAL**

| Positive | Negative |
|--|--|
| Potential for placing land in a higher use such as agricultural, commercial, or residential. | Potential loss of resource values, primarily wildlife and recreation. |
| One time payment to treasury. | Loss of future revenues from land use authorizations. |
| Decreased management costs for the BLM. | High cost of processing disposal. |
| Increase in local property tax revenues. | Increase in property taxes for person who purchases public land. |
| Could relieve current user of user fees. | Loss of future exchange potential as disposable tracts are depleted. |
| Can be used to solve existing unauthorized uses. | Loss of Payments in Lieu of Taxes |
| Can provide additional land for residential development in urban areas. | Potential economic strains on person who currently uses land but cannot afford to purchase it. |
| Opportunity for ranchers to block up their holdings. | Possible additional encumbrance and development costs for mining claim holders. |
| | Loss of future open space and parkland which could be conveyed under the R&PP Act in urban areas such as Helena. |
| | Potential for lowering property values in a large scale program. |

**TABLE 4-2
IMPACTS FROM ACQUISITION**

| Positive | Negative |
|---|---|
| Improves resource values of existing public land | Can displace existing authorized users if their use conflicts with management plans for the area. |
| Can provide improved public access to important resource values. | Removes land from the property tax base. |
| Improves manageability of existing public land by eliminating private inholdings with potential for conflicting uses. | Substantial costs in processing cases. |
| Creates more manageable land ownership patterns. | |
| Improved manageability can decrease administrative costs. | |

Impacts on Recreation Resources

Some disruption of hunting may occur adjacent to areas of oil and gas activities, but in general the hunting opportunity would be protected by the wildlife stipulations.

Other recreation activities such as fishing, hiking, backpacking, picnicking, cross-country skiing, and snowmobiling may be impacted by a disruption of the natural scene. However, due to the type, location, and season of the wildlife stipulations, the impacts will be minimal.

The primary impact of grazing on recreation is in riparian zones. In some cases, grazing reduces the desirability of a site to such an extent that recreationists choose not to participate in an activity. However, in most cases, recreationists and livestock can coexist on the same site if use by either one is not too heavy. Generally, in nonriparian allotments, moderate changes in livestock use do not adversely affect recreation to any great degree.

Forestry activities have a tendency to shift the recreation opportunities in an area from primitive or semi-primitive types to those that occur in roaded natural settings. The greater the amount of forestry activity in an area, the greater the amount of displacement. Hunting pressure generally increases with increased road access, as do driving for pleasure, ORV use, woodgathering, and similar activities. Motorized trail riding and most nonmotorized activities are reduced or completely displaced.

Recreation opportunities would remain secure on land placed in the retention category. Recreation opportunities generally would be eliminated on lands that were disposed of, unless the disposition were to another federal agency, a state agency, or a city or county government. Land placed in the further study category would continue to be available for public recreation unless it was disposed of at a later date.

If mining takes place in the Scratchgravel Hills, nonmotorized forms of recreation such as horseback riding, hiking, picnicking, and other similar activities would be affected more than motorized recreation. Generally, the disruption of the land surface, the equipment and accompanying noise, and other similar facets of mining activity reduces the desirability and the opportunity for recreation. Motorcycle or other motorized use is not affected to the degree that other uses are. At times, ORV use can actually be enhanced by mining activities. For instance, many of the trails which motorcyclists use in the Scratchgravel Hills were origin-

ally roads used by miners and prospectors. It is likely that such uses will follow future mining in the area also.

The opportunity to participate in organized motorcycle activities would be eliminated in the Scratchgravel Hills and Limestone Hills under this alternative. This could result in shifting demand to other areas, but because the current demand is small, the overall impact will probably be insignificant. Participation in other types of recreation, particularly nonmotorized types, could increase in the Scratchgravel Hills and Limestone Hills because of the closure.

Opportunities for motorized recreation would be reduced somewhat by travel restrictions in the Limestone Hills and Scratchgravel Hills. If travel restrictions are imposed in other areas, this would reduce motorized recreation opportunities in those areas as well. If vehicle closures are instituted in any areas, motorized recreation opportunities would be eliminated. At the same time nonmotorized recreation opportunities would probably be enhanced in the Limestone Hills and Scratchgravel Hills and any other areas where travel restrictions or closures might be instituted.

Special designations, accompanied by later site-specific management planning, which would define the scope and priorities for management of recreation resources, may result in more visitor services and more resource protection to enhance the existing recreation situation. It is doubtful that any negative effects will result to recreation as a result of special designations.

Conclusion

Impacts on recreation from timber harvesting can be mitigated to some extent by reducing the number of new or upgraded roads, limiting methods of harvest, limiting amount of harvesting in a general area, and other similar techniques. However, timber harvesting generally will create an irreversible commitment of resources regarding recreation use. Most recreation use patterns are changed by timber harvesting and seldom return to the previous situation. Generally, recreation will tend to move further towards the more developed forms of activity and the more primitive forms will be displaced or eliminated.

Limitations on the number and type of motorcycles, the time of year, or the size of the event could help alleviate conflicts between motorcycle race events and other recreational uses.

Overall, with the exception of reduced motorized recreational uses in specific areas, the recreation program will not be significantly altered from the present situation under this alternative.

Impacts on Visual Resources

If scenic quality Class A land is managed as VRM Class II (retention of visual quality), there should be minimal adverse impacts on the visual resource. If suitable visual quality objectives are not applied on scenic quality Class B and C land, then some significant adverse impacts could occur. Guidelines in the BLM publication *Visual Resource Management Program* provide direction to achieve management objectives utilizing VRM management classes. Conformance to the different degrees of modification allowed under the various management classes, and completion of contrast ratings for specific proposed projects should reduce the impacts of management decisions on visual resources.

Impacts on Cultural Resources

The impacts of management decisions on cultural resources will be minimal or nonexistent, if all pertinent laws, regulations, and current policies are followed. Continuing impacts to, and loss of, non-significant sites not eligible for the National Register of Historic Places will occur. Depending on the scale and timing of land ownership adjustments, impacts can be expected to occur to cultural resources. Residual impacts will occur to National Register eligible sites, even after mitigation measures, if such sites are transferred to non-federal agencies or individuals unless appropriate covenants are applied. An irreversible and irretrievable commitment of resources will occur if a determination is made that other resource values outweigh the continued management of a cultural resource site (an adverse effect determination). Conversely, cultural resources of national significance can be brought under federal protection through land ownership adjustments, thereby bringing consolidated areas of prehistoric and historic use under cultural resource management.

Impacts on Wilderness Resources

Nondesignation of the three study areas (11,218 acres) along the Rocky Mountain Front would not result in any additional adverse impacts to the wilderness values from oil and gas activity. This is because the preferred recommendation to designate these former WSAs as Outstanding Natural Areas would provide almost equally restrictive short-term protection. Long-term protection would not be as secure since an ONA designation is not as permanent as wilderness designation.

All these areas possess a high potential for oil and gas, and as a result, are entirely leased. These leases, regardless of the alternative, are not sub-

ject to nonimpairment stipulations, because the Interim Management Policy and Guidelines no longer apply for these former WSAs. Impacts associated with exploration and development activities would be subject to other resource stipulations, and consequently adverse impacts on wilderness values could be mitigated to some extent. Nondesignation of the two remaining WSAs will make their wilderness values susceptible to both short and long-term degradation from oil and gas exploration and development activities. These areas would no longer be protected by nonimpairment stipulations.

Livestock management would have little impact on the wilderness values within four of the five areas. The ungrazed Yellowstone River Island would be unaffected, while designation of the three Rocky Mountain Front units as Outstanding Natural Areas would prevent significant range impacts from occurring.

Although no new grazing improvements are anticipated for the fifth unit, Black Sage, some natural impairment could occur due to fewer restrictions governing the use of motorized vehicles for grazing management purposes.

Nondesignation of the five study areas (17,197 acres) would have some long term, adverse impacts on wilderness values. Black Sage and the Yellowstone River Island would be susceptible to degradation, since these areas would be open to development. Blind Horse Creek, Chute Mountain, and Deep Creek/Battle Creek however, will be managed as Outstanding Natural Areas, thereby ensuring protection of their outstanding natural values. The diversity of the NWPS would not be enhanced since 2,062 acres of the under-represented Foothills Prairie ecotype would not be added to the system.

Forest management would not adversely affect wilderness values on four of the study areas, since the timber would be withdrawn. Approximately 300 acres of low quality woodland timber within the Black Sage unit would be available for low priority harvest. Small localized sales of forest products would negatively influence the naturalness and solitude of the area.

Four of the study areas would be unaffected by motorcycle use events because they would be closed to such events. Black Sage, however, would be open to these events, and if they were allowed, they would have significant impacts. The noise and surface disturbance associated with this activity would noticeably degrade the area's opportunities for solitude and primitive recreation, as well as its natural values.

Continue to be managed as avoidance areas for utility and transportation corridors.

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The Yellowstone River Island is unaffected by motorized vehicle access since motorized travel within the unit is not feasible. Blind Horse Creek, Chute Mountain, and Deep Creek/Battle Creek would be closed to the general public, but special allowances would be made for use by ranchers. The limited access would not have significant impacts on the wilderness values. Black Sage, however, would not be closed to the public. As a result, the area would be subject to temporary visual and audible impacts, as well as the more lasting natural disturbances. Due to the area's fragile terrain and lack of physiographic barriers, off-road use is a major potential impact on the wilderness values in Black Sage.

The three ^{proposed ONAs} units on the Rocky Mountain Front would be closed to utility and transportation corridor selection as a result of Outstanding Natural Area designation. Although Black Sage and the island would be available for corridor review, the likelihood of selection would be remote due to their locations. If such a project was constructed, wilderness values would be forgone.

The effects of designating the Blind Horse Creek, Chute Mountain, and Deep Creek/Battle Creek areas as Outstanding Natural Areas would be similar to the effects of wilderness designation, in that the protection of natural values would be emphasized. Hardrock mining would be permitted, but is not expected to be significant. Special designations are considered less permanent than wilderness designation; thus, the degree of protection provided to natural values is less than that provided under wilderness designation.

Impacts on Timber Resources

Under this alternative, 5,197 acres of the 58,099 acres of the suitable commercial forestland (CFL) would be set aside from the harvestable base because of multiple use restrictions (see Table 2-7). Of the 5,197 acres of CFL that would be set aside, 3,729 acres would be set aside for wildlife reasons and 1,468 acres would be set aside for recreation reasons.

Of the 52,902 acres in the available base, 41,849 acres would have some silvicultural restrictions based on the TPCC inventory. The remaining 11,053 acres would have no restrictions.

Managing 52,902 acres of commercial forestland in the harvestable base for the production of forest products would result in a potentially sustainable allowable cut of approximately 26.45 million board feet of timber/decade.

Under this alternative, 2,650 acres of woodland would be unavailable for the harvest of forest pro-

ducts. Managing the remaining 16,290 acres of woodland would make additional forested acreage available for limited harvest of sawtimber, fuelwood, and minor forest products.

Harvest practices including clearcutting, shelterwood, and selective cutting would influence vegetative cover on approximately 880 acres per year. This would impact wildlife and grazing. The impact would be in the form of increased or decreased forage and cover.

Other significant impacts of forest management are related to access caused by road construction. These impacts may be positive or negative, depending on the need to make specific public land available for increased public use, and on the need to protect wildlife or other resource values from increased human disturbance.

Forest development practices such as thinning, planting, and the use of herbicides would improve stocking and growth potential of forest stands and decrease pest and disease problems in these stands.

Grazing will influence forest management primarily by endangering the establishment of regeneration. This influence can be partially mitigated through control of season of use and livestock distribution.

Although the Scratchgravel Hills are set aside (1,468 acres) for recreation purposes, the majority of the commercial forestland has relatively low productivity. This amounts to a loss of approximately 50 m bd ft/yr. from the potential allowable cut.

Loss of timber production in response to wildlife needs involves 3,729 acres of the commercial forest land base. This amounts to an average reduction in yield of 186 m bd ft/yr.

Acreage set aside for fragile sites and reforestation problems amount to 4,982 acres or 8% of the base productivity.

Impacts on Range Resources

Under this alternative, a short-term reduction of 3,009 AUMs is proposed for nineteen allotments and a short-term increase of 805 AUMs is proposed for seven allotments. These changes would result in a net decrease of 2,204 AUMs or 7% of the current authorized use.

These short-term reductions or increases are needed to achieve the management objectives developed for each allotment in the I category (see Appendix E). Appendix N displays the recommended change in AUMs for each allotment in the I category. This appendix also indicates allotments

where management changes other than changing the total number of AUMs are needed to achieve the management objectives.

In the long term, there would be 1,916 AUMs available for livestock use in addition to the 31,501 AUMs of current authorized use. Because the short term proposes a net downward adjustment, this long-term increase actually represents a net upward adjustment of 4,120 AUMs when compared to the short term. This projection of additional livestock forage is dependent upon implementation of grazing systems, installation of range improvements, and performance of land treatments to increase forage production or convert potentially suitable sites to suitable. Table 4-3 summarizes the short and long-term changes proposed in current authorized use. Table 2-5 summarizes the kinds and quantities of improvements and treatments planned under this alternative.

**TABLE 4-3
CHANGES IN GRAZING PREFERENCE:
ALTERNATIVE A**

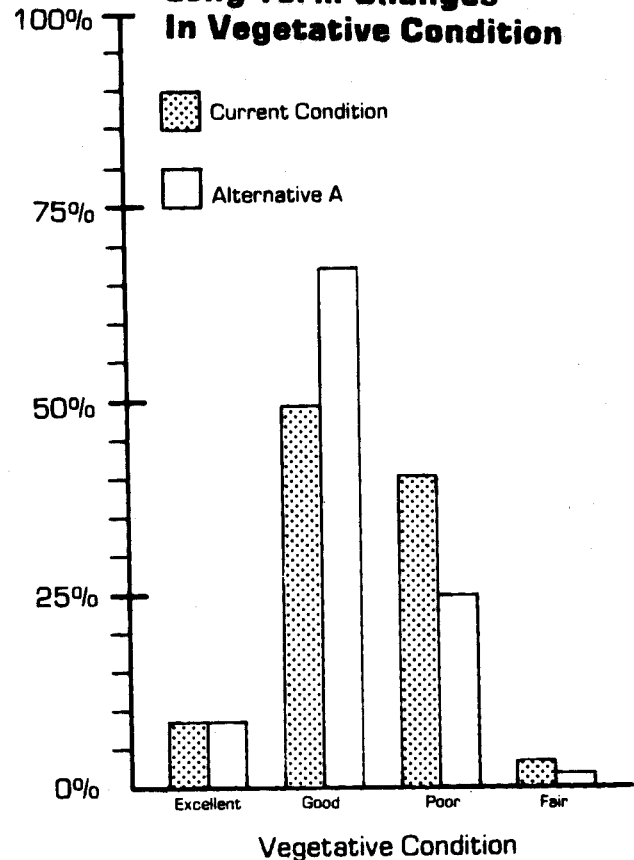
| | Total AUMs | Net Change in Use AUMs | % |
|------------------------|---------------|---------------------------|------|
| Current Authorized Use | 31,501 | — | — |
| Short-Term Adjustment | 29,297 | -2,204 | -7.0 |
| Long-Term Adjustment | 33,417 | +1,916 | +6.1 |

The impacts on each livestock operator would vary according to how grazing use in the allotment fits into the yearlong ranch operation. Seventeen of the nineteen reductions proposed would be more than 15% of current authorized use. These seven reductions would normally be phased in over a five year period, thus permitting the operator to locate alternative pasture or to reduce herd size. All seven of the allotments proposed for increases could be subject to the same five year phase-in, depending on the level of monitoring required to establish the final adjustment.

The only significant short-term change in vegetation that would occur under this alternative is a probable increase in the vigor of preferred forage plants where AUM reductions would result in less forage utilization.

Figure 4-1 illustrates the expected changes in vegetative condition in the long-term. The major long-term effect on native vegetation will be an improvement in the kinds and amounts of vegetation produced on sites that are now in poor or fair condition. That is, some poor condition sites would be converted to fair condition and some fair condi-

**FIGURE 4-1
Alternative A
Long Term Changes
In Vegetative Condition**



tion sites would be converted to good condition. These projections are based on the potential of the vegetative community that presently occupies a site to improve in response to changes in grazing management. The assumption is made that the vegetative condition for sites in Category M and C allotments would not change. The 2,860 acres proposed for reseeding or burning (see Table 2-5) were not included in computing long-term vegetative condition for Alternative A, since they would become unclassified acres once the native vegetation was disturbed.

The range improvements that are summarized in Table 2-5, would be needed to implement management objectives and therefore would have a desirable impact on vegetation. Because many of these improvements would lead to improved distribution of livestock and/or production of better kinds and quantities of livestock forage, they should have a beneficial effect on livestock production.

Control of noxious and poisonous plants, which is proposed for 467 acres, would have a locally beneficial impact on livestock grazing by reducing death and sickness in domestic animals. While some additional livestock forage may be produced as a

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result of timber harvesting, additional livestock use would be granted on a year to year basis and would not have a long-term impact on the total number of AUMs allocated to livestock.

Seeding and interseeding of native and introduced plants is proposed for 2,560 acres under this alternative. For the most part, the sites proposed to receive this type of treatment have very low natural potential to improve from their present poor or fair condition, because of unfavorable soil or climatic conditions. Three hundred acres are proposed for controlled burns to decrease the amount of sagebrush, juniper, and other woody plants that currently reduce the production of herbaceous vegetation.

Conclusion

The short-term impacts on livestock grazing are mitigated somewhat by the fact that during the 1980, 1981, and 1982 grazing seasons, the BLM has issued annual licenses for nonuse that amount to 1,999 AUMs. These licenses involved nine of the nineteen allotments proposed for downward adjustments under this alternative. The BLM has also issued licenses in each of the last three years for temporary nonrenewable use amounting to an additional 278 AUMs in two of the allotments that are proposed for upward adjustments.

The 1,999 AUMs of nonuse would be part of the short-term downward adjustment proposed in this alternative. Therefore the impacts would be somewhat mitigated since the net reduction from recent actual use would amount to 205 AUMs.

Appendix F describes the kinds of range improvements that are proposed. Careful placement of these improvements and proper design are effective tools in mitigating possible adverse impacts on vegetation and livestock.

The only irreversible commitments proposed that impact the vegetation involve the 2,560 acres proposed for reseeding. When the native vegetation on these acres is replaced by other plant species, it would be unlikely that a native community would again occupy the site (within 50-75 years or more).

Overall, the quality and quantity of vegetation produced on public land would improve. While a 7.0% downward adjustment in livestock AUMs is proposed for the short term, a long-term upward adjustment of 6.1% in AUMs is expected. Both structural and nonstructural range improvements and treatments are proposed at an estimated cost of \$449,331.

Through mitigation, some potentially adverse impacts can be avoided. There would be a monetary loss to livestock operators over the short

term where AUM reductions are proposed, but overall, livestock production should improve over the long term.

Impacts on Wildlife and Fisheries

Aquatic Habitat

Aquatic habitat would be fully protected within the areas where oil and gas leases would be subject to no surface occupancy stipulations. Aquatic resources downstream from these areas would similarly be protected. Those portions of the Pine Butte and Antelope Butte swamps that contain federal mineral ownership would be fully protected from potential water contamination.

Aquatic habitat within the areas zoned for seasonal stipulations could be subject to minor water contamination and increased sediment caused by erosion from oil and gas activities. However, this is mostly mitigated through application of standard stipulations.

Both upward and downward adjustments to livestock usage will occur on the 1 allotments. With these livestock adjustments, seasonal changes, and limited fencing along streams, the overall change in the aquatic habitat will be positive. The satisfactory aquatic habitat will increase to 81.6 miles, while the unsatisfactory condition will decrease to 12.6 miles (see Table 4-4). The M and C allotments will increase slightly and provide more satisfactory aquatic habitat.

Development of management objectives for each allotment and the eventual implementation of these will bring about the necessary changes to improve the aquatic habitat. A reduction in livestock numbers and the implementation of grazing systems are the most important factors in the bringing about the improvement in aquatic habitat. While fencing to totally exclude livestock is considered by many to be the most effective way to improve aquatic habitat, it is the most expensive. The proposed action will use a minimal amount of fencing to achieve satisfactory aquatic habitat. If, in the future, monitoring identifies areas where the management objectives are not being met, then a management decision could be made to fence the aquatic habitat.

Short-term adverse impacts from increased commercial timber harvesting in the resource area would result in increased suspended and bed-load sediment yields. This would adversely impact aquatic habitat in those streams affected. Surface runoff is the primary vehicle for the transportation of sediment to streams from adjacent sources. Road construction and other soil disturbances are considered to be the primary sources of

**TABLE 4-4
LONG-TERM WILDLIFE HABITAT CHANGES RESULTING FROM GRAZING ALLOTMENT AND RIPARIAN HABITAT
MANAGEMENT: ALTERNATIVE A¹**

| Type of Habitat | Current Condition | | Alt. A | | Type of Habitat | Current Condition | | Alt. A | |
|-------------------------------------|-------------------|-----|--------|-----|----------------------------------|-------------------|----|-----------------|---------------|
| | Acres | % | Acres | % | | Acres | % | Acres | % |
| Elk-wt/sp | | | | | Antelope-wt/sp | | | | |
| Satisfactory | 51,759 | 77 | 60,267 | 90 | Satisfactory | 10,452 | 78 | 11,221 | 83 |
| Unsatisfactory | 14,926 | 23 | 6,418 | 10 | Unsatisfactory | 3,072 | 22 | 2,303 | 17 |
| Elk-su/fa | | | | | Antelope-su/fa | | | | |
| Satisfactory | 19,896 | 77 | 22,561 | 88 | Satisfactory | 10,921 | 77 | 11,541 | 81 |
| Unsatisfactory | 5,922 | 23 | 3,257 | 12 | Unsatisfactory | 3,259 | 23 | 2,639 | 19 |
| Elk-yearlong | | | | | Antelope-yearlong | | | | |
| Satisfactory | 6,678 | 75 | 7,685 | 87 | Satisfactory | 15,618 | 79 | 16,882 | 85 |
| Unsatisfactory | 2,142 | 25 | 1,135 | 13 | Unsatisfactory | 4,212 | 21 | 2,948 | 15 |
| Mule deer-wt/sp | | | | | Waterfowl-sp/su/fa | | | | |
| Satisfactory | 82,147 | 75 | 95,035 | 86 | Satisfactory | 1,975 | 79 | 2,375 | 95 |
| Unsatisfactory | 27,763 | 25 | 14,875 | 14 | Unsatisfactory | 525 | 21 | 125 | 5 |
| Mule deer-su/fa | | | | | Grizzly-yearlong | | | | |
| Satisfactory | 9,135 | 90 | 9,541 | 94 | Satisfactory | 12,882 | 60 | 19,357 | 90 |
| Unsatisfactory | 1,015 | 10 | 609 | 6 | Unsatisfactory | 8,588 | 40 | 2,113 | 10 |
| Mule deer-yearlong | | | | | | | | | |
| Satisfactory | 38,009 | 78 | 43,191 | 89 | | | | | |
| Unsatisfactory | 10,521 | 22 | 5,339 | 11 | | | | | |
| Bighorn sheep-wt/sp | | | | | | | | | |
| Satisfactory | 5,095 | 83 | 5,174 | 85 | | Miles | % | Miles | % |
| Unsatisfactory | 1,035 | 17 | 920 | 15 | | | | | |
| Bighorn sheep-su/fa | | | | | Fisheries- | | | | |
| Satisfactory | 9,317 | 92 | 9,494 | 94 | Satisfactory | 58.1 | 62 | 81.6 | 87 |
| Unsatisfactory | 783 | 8 | 606 | 6 | Unsatisfactory | 36.1 | 38 | 12.6 | 13 |
| Bighorn sheep-yearlong ² | | | | | Long-term riparian habitat | | | | |
| Satisfactory | 12,160 | 100 | 12,160 | 100 | cond. on I Allot. ³ | | | 61.75 | 89 |
| Unsatisfactory | 0 | 0 | 0 | 0 | Satisfactory | 35.75 | 51 | 54.4 | 78 |
| Moose-wt/sp | | | | | Unsatisfactory | 33.95 | 49 | 15.3 | 22 |
| Satisfactory | 5,832 | 60 | 6,480 | 66 | Long-term riparian habitat | | | 7.95 | 11 |
| Unsatisfactory | 3,888 | 40 | 3,240 | 34 | cond. on M&C Allot. ³ | | | | |
| Moose-su/fa | | | | | Satisfactory | 67.45 | 93 | 68.55 | 95 |
| Satisfactory | 5,012 | 88 | 5,138 | 89 | Unsatisfactory | 4.75 | 7 | 3.65 | 5 |
| Unsatisfactory | 748 | 12 | 622 | 11 | | | | | |

¹All terrestrial wildlife species information is shown in acres and percentages.

²This yearlong habitat is in the Devils Kitchen and portions of the Sleeping Giant areas that are predominantly inaccessible to domestic livestock.

³Condition of riparian habitat in 20 years with the *highest ranking* first priority I allotments fully implemented.

sediment. Increased road construction would result in the high priority forest management areas. Portions of the Silver Creek, Prickly Pear, and Little Prickly Pear Creek watersheds would be the most affected. The Prickly Pear creeks are rated substantial fishery resources and Silver Creek is rated a moderate fishery resource (MDFW&P 1980b). Road construction and logging adjacent to streams can have the most adverse impacts on aquatic resources (Meehan et al. 1977). The application of standard operating procedures including proper road design, buffer zones adjacent to streams, and techniques that significantly reduce surface erosion would minimize the adverse impacts. In addition, major forest activity plans will be prepared on the high priority forest management areas, which will apply specific mitigating measures for the protection of the aquatic resource. Approximately 6% of the commercial timber base has been set aside for wildlife protection purposes. A portion of this set aside area includes adequate buffer zones on all perennial tributaries in the resource area. The setting aside of the Scratchgravel Hills from the commercial timber base will have neither beneficial nor adverse impacts on aquatic habitat.

Some isolated tracts with small reaches of aquatic habitat would be subject to disposal from public ownership. About 1.3 miles are in the disposal area, and 2.4 miles are in the further study category. All other aquatic habitat in the resource area would be zoned for retention.

Overall, the impact would be minimal. Public fishing access that is currently available would be maintained, and opportunities for monitoring or managing aquatic habitat would remain. Future acquisition to benefit habitat management and fishing access would be possible. No public land along major rivers is under consideration for disposal.

Riparian Habitat

The adverse impacts of livestock grazing upon riparian habitat has recently been acknowledged in various symposia (Cope 1979, USDA, FS 1978b, USDA, FS 1977b, Peek and Dalke 1982). However, more research is needed to determine what livestock management strategies are the most appropriate to maintain or improve riparian habitat (Platts 1978).

Experience with three AMPs and several non-AMP allotments in the resource area indicates that riparian management goals can be compatible with livestock grazing when grazing systems are designed to meet riparian needs. Similar findings have been reported by the BLM (USDI, BLM 1980) and Myers (1981). The techniques that can be used to lessen the impacts of livestock grazing

are discussed in the Management Guidance Common to all Alternatives section.

For analysis purposes, the seventy-seven allotments classified as I category have been further divided into first and second priority. This was done by multidisciplinary review in order to emphasize those allotments where common resource problems existed for range, wildlife, and watershed activities, and to show where management techniques and efforts would be the most beneficial. Through this review, thirty-six first priority and forty-one second priority I allotments were categorized. It is realistic to assume that two AMPs per year for the next twenty years can be implemented. This means that forty AMPs, or approximately the first priority I allotments, will be implemented in the next twenty years.

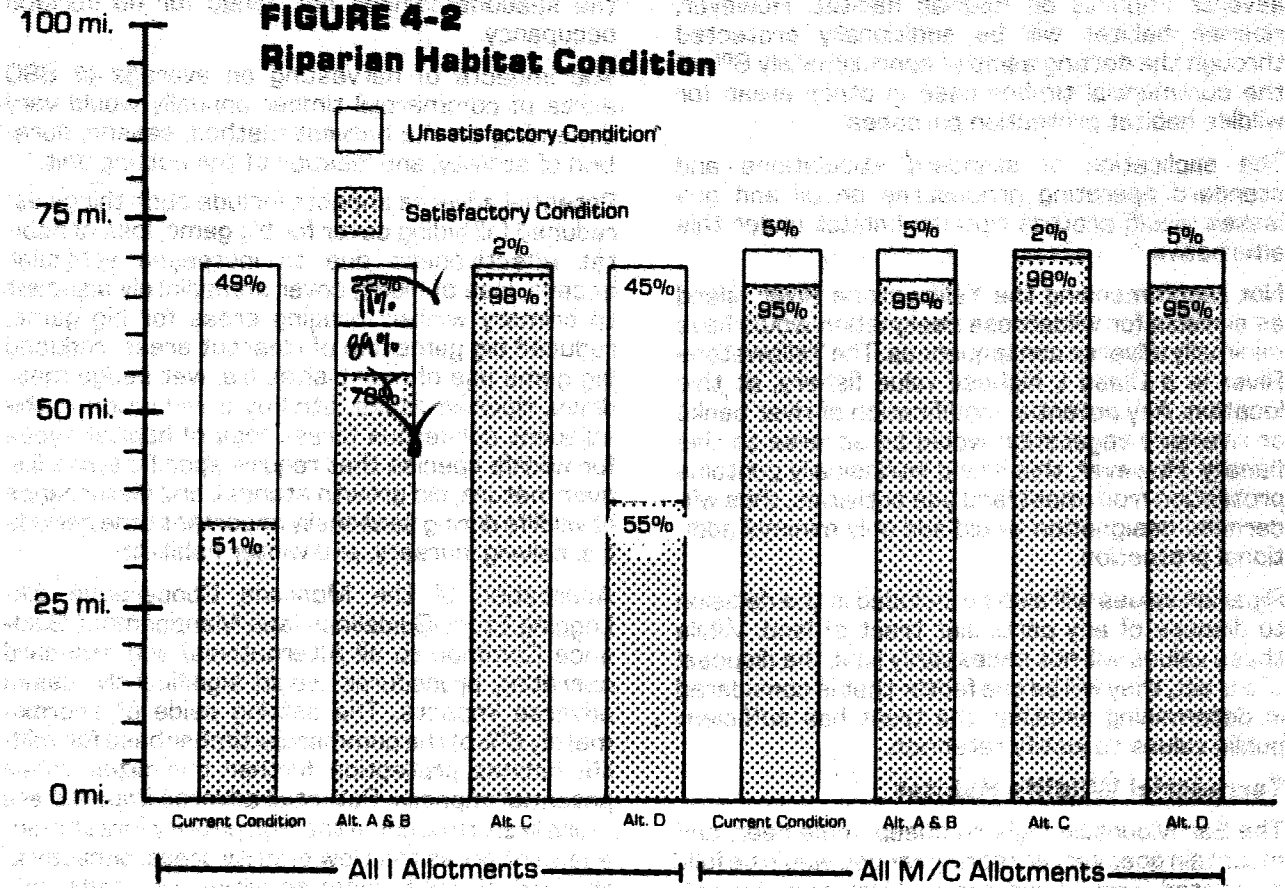
Of the thirty-six first priority I allotments, seventeen contain 22.65 miles, or 58.5%, of the total unsatisfactory riparian habitat. The remaining nineteen first priority I allotments either contain no riparian habitat or they contain satisfactory riparian habitat. The forty-one second priority I allotments contain 11.3 miles, or 29.5%, of the total unsatisfactory riparian habitat. The remaining 4.75 miles, or 12%, of unsatisfactory riparian habitat are in the maintenance and custodial category allotments. No change in management is expected for the M and C allotments with unsatisfactory riparian habitat.

Under alternative A, the preferred action, riparian habitat quality would improve from 51% satisfactory to 78% satisfactory for all I allotments over the long-term (see Table 4-4). This represents an increase from 35.75 miles to 54.40 miles of satisfactory riparian habitat. The 4.75 miles of unsatisfactory riparian habitat in the M and C allotments are not expected to improve over the long-term (Figure 4-2).

The improvement in riparian condition for the I allotments will be the result of such things as reduced stocking rates (1,178 AUMs on nineteen allotments with unsatisfactory riparian habitat), livestock grazing systems designed with riparian habitat improvement objectives, season-of-use changes, class-of-stock changes, and in some instances, fencing to exclude livestock grazing.

Short-term adverse impacts on riparian habitat would result from increased timber harvesting in the resource area. Road construction through riparian zones would be the primary source of disturbance. Application of standard operating procedures, including major forest activity planning, would minimize the adverse impacts.

**FIGURE 4-2
Riparian Habitat Condition**



The chart illustrates the riparian habitat condition for various allotment types and distances. The y-axis represents distance in miles (0, 25, 50, 75, 100). The x-axis is divided into 'All I Allotments' and 'All M/C Allotments'. Data points are provided for Current Condition, Alternatives A & B, and Alternative C at each distance.

For All I Allotments, the current condition shows 51% satisfactory and 49% unsatisfactory habitat. Alternatives A & B show 78% satisfactory and 22% unsatisfactory habitat. Alternative C shows 98% satisfactory and 2% unsatisfactory habitat.

For All M/C Allotments, the current condition shows 55% satisfactory and 45% unsatisfactory habitat. Alternatives A & B show 95% satisfactory and 5% unsatisfactory habitat. Alternative C shows 98% satisfactory and 2% unsatisfactory habitat.

The chart illustrates the riparian habitat condition for various allotment types and distances. The y-axis represents distance in miles (0, 25, 50, 75, 100). The x-axis is divided into 'All I Allotments' and 'All M/C Allotments'. Data points are provided for Current Condition, Alternatives A & B, and Alternative C at each distance.

For All M/C Allotments, the current condition shows 55% satisfactory and 45% unsatisfactory habitat. Alternatives A & B show 95% satisfactory and 5% unsatisfactory habitat. Alternative C shows 98% satisfactory and 2% unsatisfactory habitat.

Setting the Scratchgravel Hills aside from the timber program will have neither beneficial nor adverse impacts on riparian habitat. However, riparian habitat will be additionally protected through the setting aside of approximately 6% of the commercial timber base in other areas for wildlife habitat protection purposes.

The application of standard stipulations and standard operating procedures on oil and gas leases would protect riparian habitat under this alternative.

Not recommending the Yellowstone River Island as suitable for wilderness designation would have minimally adverse consequences. The Yellowstone River is a Class I, highest value fishery, at this location. Any potential modification of river banks or riverside vegetation would be adverse to this fishery. However, this island intrinsically contains protection from most land use activities, thus wilderness designation would add only minimal additional protection.

Riparian values will also be included in the decision to dispose of any particular tract of land. While these values will not necessarily limit the disposal of a tract, they will be one factor that is considered in determining whether the tract has sufficient public values to justify retention.

Terrestrial Wildlife Habitat

The Ear Mountain bighorn sheep, mule deer, and mountain goat winter/spring ranges would be fully protected from oil and gas exploration and development activities because of the areas zoned for no surface occupancy. Similarly, all federal minerals in the Ear Mountain Wildlife Management Area would be zoned for no surface occupancy. This wildlife management area is managed by the Montana Department of Fish, Wildlife, and Parks for big game and grizzly bear habitat. Approximately 80-100 bighorn sheep, 400-500 mule deer, and 10-20 mountain goats use this area throughout the year, and there is also a high density of grizzly bear usage in the area. Portions of the mule deer and elk winter/spring ranges in the Blackleaf Wildlife Management Area would be fully protected because of the no surface occupancy zone. This no surface occupancy zone will also protect a portion of the Blackleaf-Teton mule deer winter/spring range, which contains approximately 400-500 animals (Kasworm 1981). The remaining big game winter/spring ranges along the front will be protected through no surface occupancy and seasonal stipulations. These seasonal stipulations would minimize disturbance from exploration and development activities during the winter/spring months (typically from December through April). However, the potential exists for increased habi-

tat loss through construction, development of ancillary facilities, and increased human access on the seasonal ranges not zoned for no surface occupancy.

The impacts of harvesting an average of 880 acres of commercial timber annually would vary depending on the harvest method, season, duration of activity, and location of the cutting unit.

Potential adverse impacts include such things as: reduced fall hiding cover for big game, loss of habitat effectiveness due to increased vehicular access, loss of hiding cover immediately adjacent to primary winter foraging areas for big game, reduced big game use of clearcut areas, reduced big game use of moist-sites (i.e. wet sedge meadows, riparian zones, etc.) by a reduction in the adjacent coniferous forest, loss of habitat types for wildlife species that require specific types (i.e. over mature, old growth stands), and disturbance of wildlife during seasonally important time periods (i.e. calving, nursery, and winter habitat).

Application of the Montana Cooperative Elk-Logging Study Guidelines (see Management Guidance Common to all Alternatives) and standard operating procedures would significantly lessen adverse impacts. The setting aside of approximately 6% of the commercial timber base for wildlife habitat protection further minimizes these potential impacts. Potential adverse impacts are more likely to occur in the high priority forest management areas than low priority areas, because of the intensity of harvest activities (i.e. roads, cutting units, etc.).

The Rogers Pass high priority area contains summer and fall grizzly bear habitat. Intense harvest activities could result in significant adverse impacts. The application of special mitigative measures for grizzly bear management that would be developed in response to specific proposals would reduce, but not eliminate, these impacts.

The Elkhorn high priority area contains key seasonal habitat for a variety of big game including deer, elk, and moose. Stipulations on all harvest activities for the protection of elk habitat would lessen adverse impacts. It is assumed that if management guidance for elk habitat is followed, deer and moose habitat will similarly be managed properly (USDA, FS 1979).

Significant adverse impacts are not expected to occur to elk habitat, although timber harvesting in this unit prior to the completion of the Elkhorn wildlife monitoring study will have some impacts on elk seasonal movements. The identification of this unit as a high priority area and including it in the regulated timber base is not consistent with the

management direction of the adjacent Elkhorn Wildlife Management Area on the Helena National Forest.

Setting aside the timber in the Scratchgravel Hills would have minor beneficial impacts to terrestrial wildlife habitat.

Restrictions on motorized vehicle access under this alternative would provide additional protection of seasonal wildlife habitats for the Scratchgravel Hills and Limestone Hills. Site-specific guidance would aid in the protection of seasonal wildlife habitats. In general, the impacts to wildlife from utility and transportation corridors would be minor, since most impacts to wildlife from power-line construction can be effectively mitigated. Collisions of migrating birds with towers or wires is an impact that sometimes cannot be effectively mitigated regardless of their location or placement.

Avoidance areas along major rivers would help protect bald eagle and waterfowl habitat. Avoidance areas in the Limestone Hills and Sleeping Giant areas would help protect and maintain big game habitats. Bald eagle and waterfowl habitat could be impacted in the three window areas.

Under this alternative, all of the waterfowl, bighorn sheep, mountain goat, and moose habitat would be in the retention zone, so there would be no impacts. Most of the elk and antelope habitat would also be in the retention zone. Isolated tracts in the disposal zone in Park, Meagher, Cascade, and Lewis and Clark counties may have limited upland game bird populations. In addition, about 3,600 acres of mule deer habitat in the resource area would be in the disposal zone. Because of the small amount of habitat involved, disposal of these tracts would have only minor impacts on mule deer and upland game birds.

Under this alternative, terrestrial wildlife habitat would be subject to the impacts of mineral exploration and development. The impacts to terrestrial wildlife habitat would depend on the extent and duration of the exploration and development. Seasonally important antelope habitat could be adversely affected. Other terrestrial habitat, including raptors and other nongame birds, would be similarly affected.

Significant beneficial impacts and no adverse impacts would result to all wildlife species and habitat in areas that are closed to motorcycle race events.

Negligible impacts to wildlife habitat would occur in the Montana City use area. The quality of summer mule deer habitat would be impacted in the Hilger Hills, Spokane Hills, and Marysville areas. Because none of these areas are crucial summer mule deer

habitat, the summer impacts would be slight. Motorcycle activities conducted during any other season would cause significant disturbance impacts to mule deer, especially in the Spokane Hills and Marysville areas.

If motorcycle usage occurs only in the summer, there will be minor disturbance of elk, primarily in the Marysville area. There would be large impacts on habitat considered suitable for introduction or range expansion of wild turkeys (Merriam's turkey), particularly in the Hilger Hills and Spokane Hills.

Depending on the magnitude of motorcycle use, some habitat (vegetation) loss would occur from motorcycle usage in each area.

The effects on wildlife of leasing and mining coal will vary between species. Physical loss of habitats and disturbance resulting from increased human activities would be the major impacts. Some physical loss of habitats would be permanent, while some could eventually be restored through rehabilitation techniques.

Adequate baseline wildlife inventory data are lacking for this coal field. However, nesting sites and yearlong hunting areas for raptors; dancing grounds, brooding areas, and wintering areas for sharp-tailed grouse; pheasant habitat; yearlong antelope habitat; and winter ranges for antelope, mule deer, white-tailed deer, and elk would be the primary wildlife values impacted by coal development. Application of the unsuitability criteria to available inventory data resulted in the classification of 7% of the federal acres as requiring a no surface occupancy stipulation. This would help insure adequate protection of sharp-tailed grouse dancing grounds and antelope, mule deer, white-tailed deer, and elk crucial winter ranges.

The most significant effect of special designations on fish and wildlife habitat would be in the Rocky Mountain Front area, where approximately 10,000 additional acres would be made unavailable for surface occupancy. This would benefit all types of habitat, but especially grizzly bear, gray wolf, and big game habitat, which would be afforded total protection from onsite disturbance.

Grizzly Bear. Federal minerals in the proposed outstanding natural areas and the Antelope Butte Swamp, Ear Mountain-Pine Butte Swamp, and Beaver Meadows areas would be zoned for no surface occupancy. This would fully protect these three key seasonal habitats. Grizzly bear habitat on adjacent nonfederal land would continue to be subject to oil and gas exploration and development activities, increasing the need for protection of such habitat on federal land.

Zoning those areas listed above for no surface occupancy precludes the possibility of exploration and development activities taking place simultaneously in more than one of these areas. If that were to occur, it would likely jeopardize the RMF grizzly population (USDI, FWS 1980b). All remaining occupied grizzly bear habitat would be zoned for seasonal stipulations. These stipulations would typically preclude exploration and development activities from April through August. The impacts to grizzly bear habitat in these areas primarily would be increased road construction and direct habitat loss from any other construction required.

Important grizzly bear habitat such as aspen and other riparian communities on the Rocky Mountain Front would significantly benefit under this alternative. Management objectives for all livestock grazing allotments that contain grizzly bear habitat would be to improve or maintain key grizzly bear habitat. All allotments, except one, with key seasonal habitat are I allotments and as such will be first priority for AMP development. The following improvements or management opportunities will be employed in developing or modifying livestock grazing plans in allotments 6303, 6307, and 7613:

defer turn-out until July 1 annually,

rest or defer grazing until at least August 15 on at least 50% of the total grizzly bear habitat within an allotment,

do not salt or build additional water developments within one-fourth mile of any identified riparian community types,

consider fencing large riparian community types as an alternative to grazing system implementation, and

graze aspen/riparian habitats for not more than one hot season (generally 7/1—9/1) out of every three years.

Season-long domestic livestock grazing has been shown to be detrimental to riparian community condition (Cooper 1977 and Cope 1979). Grizzly bear usage and diet dependency on moist sites has been documented by Schallenberger and Jonkel (1980) and Aune and Stivers (MDFW&P 1981).

Approximately 1,824 acres of seasonally important grizzly bear habitat would remain unleased to livestock grazing under this alternative.

Grizzly bear habitat would improve from the current 40% unsatisfactory to approximately 10% unsatisfactory (see Table 4-4) mainly from incorporating management objectives for grizzly bear habitat into livestock grazing plans and by instituting a moderate reduction in AUMs.

Gray Wolf. The no surface occupancy zones delineated for grizzly bear habitat and ONAs also contain crucial big game winter/spring ranges. These big game winter/spring ranges would be fully protected, which would significantly benefit wolf recovery habitat by protecting the prey base. All remaining seasonal big game ranges on the Rocky Mountain Front would be zoned for seasonal stipulations. These stipulations would minimize disturbance from exploration and development activities during the winter/spring months (typically from December through April). The main impacts to big game habitat in these areas would be increased road construction and direct habitat loss from any other construction required.

The majority of the big game seasonal habitat on public land in the Rocky Mountain Front, with the exception of bighorn sheep winter/spring habitat, is currently in satisfactory condition. A general improvement in forage availability and habitat conditions on bighorn sheep habitat would be expected through the proposed grazing systems and AUM reductions. All other big game seasonal range would be maintained or slightly improved. These factors would benefit wolf recovery habitat.

Peregrine Falcon and Bald Eagle. The application of special and standard stipulations and standard operating procedures will fully protect peregrine falcon and bald eagle habitat from impacts caused by oil and gas exploration and development.

Under this alternative, the Yellowstone River Island would not be recommended as suitable for wilderness designation. Any potential modification or loss of the mature cottonwoods on the island would be adverse to bald eagle and peregrine falcon seasonal usage. No nesting by these species is known to occur, however, rather concentrated winter usage by bald eagles can occur. The habitat for peregrine falcon and bald eagles on the RMF would be protected even without wilderness designation because of the DNA designations in those areas.

Under this alternative, tracts of public land known to be inhabited by threatened, endangered, or sensitive species, or listed by the FWS as critical habitat, would be retained. All known peregrine falcon nesting sites would also be retained. Areas outside of the retention zones that meet the criteria for future peregrine release sites would be evaluated on an individual basis. Most nesting areas for the bald eagle are along rivers, and as such, they have been identified for retention.

Mule Deer. Mule deer are the most numerous and widespread big game species in the resource area. Winter/spring habitat is much more abund-

ant than any other seasonal type. Winter/spring habitat is currently 25% unsatisfactory. Under this alternative, unsatisfactory habitat would improve to 13.5% unsatisfactory (see Table 4-4). This will primarily be a result of mule deer management objectives being incorporated into livestock management plans. Priority areas include northern Jefferson and Broadwater counties where a preponderance of bitterbrush subtype occurs. Livestock grazing management objectives for bitterbrush winter ranges will include, for example, limiting livestock utilization levels of bitterbrush, deferring livestock grazing on at least 50% of a winter range until after August 15, and on some allotments a reduction in livestock AUMs. Mule deer spring range conditions would improve somewhat through livestock grazing management and an overall 7% decrease in livestock AUMs. Improvement would be reflected in an increased abundance of early growing grasses and forbs that are critically important to deer during April and May.

Summer/fall habitat would improve moderately under this alternative from 10% unsatisfactory to 6% unsatisfactory (see Table 4-4). Riparian zones and moist north slopes would be the summer/fall habitat components most improved through the implementation of grazing systems. Of the 48,350 acres of yearlong mule deer habitat, approximately 22% is currently in unsatisfactory condition. This would significantly improve to 11% unsatisfactory under this alternative due to grazing system implementation (see Table 4-4), browse management objectives, and a decrease in livestock AUMs.

The extent of current losses of mule deer from fence entanglement are not completely known. The construction of 62.2 miles of additional fence would increase entanglement hazards, however, standard operating procedures (i.e. fence design, wire spacings, fence type, etc.) would largely mitigate this.

The Black Sage WSA contains mule deer winter/spring range identified as crucial by established resource area criteria. Approximately 300-400 mule deer migrate from Devils Fence and the Elkhorn Mountains to winter in this unit. This unit would not be given the total protection that wilderness designation would afford, and minor adverse impacts on mule deer habitat could result from future development activity. Mule deer habitat on the RMF would not receive protection through wilderness designation, but would be adequately protected by the designation of the three areas under study as ONAs.

Bighorn Sheep. Under this alternative, bighorn sheep winter/spring habitat conditions would marginally benefit. Condition ratings for crucial seasonal habitat would improve slightly from 17% unsatisfactory to 15% unsatisfactory (see Table 4-4). Some improvement in habitat conditions would result through a reduction of 100 AUMs and implementation of livestock grazing systems. However, unsatisfactory habitat conditions would prevail on one winter/spring range on the Rocky Mountain Front.

Bighorn sheep summer/fall habitat is largely in satisfactory condition. Adequate areas remain ungrazed by livestock in the majority of the summer/fall use areas because topography is steep and water is limited. Habitat condition ratings would improve from the current 8% unsatisfactory to 6% unsatisfactory (see Table 4-4). Year-long habitat occurs principally in the Sleeping Giant and Devils Kitchen areas, and is characterized by extremely steep, rocky terrain. The majority of it is unleased to livestock grazing. Condition ratings are all satisfactory and will not change under any alternative. Due to limited conflicts with domestic livestock and abundant forage, these areas could easily support two to three times their present number of sheep.

Elk. Of the approximately 101,300 acres of elk habitat in the resource area, 66% is winter/spring habitat. Winter/spring habitat would improve from 23% unsatisfactory to 10% unsatisfactory under this alternative (see Table 4-4). This improvement would mostly be a result of elk management objectives being incorporated into livestock management plans and an overall 7% decrease in livestock AUMs. Improvement would be reflected by an increase in vigor, composition, and availability of bunchgrasses on winter/spring use areas. The dietary overlap between elk and cattle is significant on winter/spring ranges (Gordon 1968). This can lead to direct forage competition and reduced forage availability. A common problem in the resource area is livestock utilization levels of more than 50% on elk winter/spring ranges. The improvement in condition of winter/spring ranges will mostly be accomplished by implementing livestock utilization objectives, changing livestock distribution patterns, and making a direct forage allocation to elk on some allotments.

Elk calving occurs to some extent on all spring ranges. Two allotments containing calving habitat would be subject to sagebrush burning projects totaling approximately 300 acres. Calving habitat will be adversely affected on these allotments, although mitigative measures attached to the burning projects will lessen these impacts.

4 — ENVIRONMENTAL CONSEQUENCES

Elk summer/fall habitat would improve significantly from 23% unsatisfactory to approximately 12% unsatisfactory (see Table 4-4) through this alternative. The majority of this improvement would be the result of improved riparian zones and mesic habitats.

All of the 25,500 acres of summer/fall habitat in the resource area are within livestock grazing allotments identified for future AMP development. The majority of these are in the Bull-Dry Mountain, Elkhorn, and Marysville areas. Livestock grazing systems will benefit elk summer/fall habitat through deferment and rest of mesic areas. However, a social intolerance of cattle will continue to prevent elk from making substantial use of some mesic areas at the same time livestock are using the pasture. Substantial elk summer use can be accommodated only by providing extensive mesic habitats essentially free of livestock use each year.

Elk yearlong habitat would improve to 13% unsatisfactory from the present 25% unsatisfactory (see Table 4-4).

Pronghorn Antelope. Under this alternative, antelope winter/spring habitat would improve somewhat from that current 22% unsatisfactory to 17% unsatisfactory (see Table 4-4). The cover and forage afforded by species such as big sagebrush is a limiting factor in the Winston Flats, Black Sage, Boulder River, and Whitetail Creek areas, and no big sagebrush treatments are proposed under this alternative in those areas. The herbaceous component of winter/spring habitat would similarly benefit by the proposed grazing systems with incorporated rest and deferment treatments.

Summer/fall habitat would improve over the long term from the current 23% unsatisfactory to 10% unsatisfactory (see Table 4-4). Habitat identified as yearlong usage would improve from the current 21% unsatisfactory to 15% unsatisfactory (see Table 4-4).

The construction of 62.2 miles of new fence necessary to implement grazing systems would not result in barriers to antelope movement due to standard operating procedures. Alteration of the existing thirteen miles of barrier fence will improve antelope movements.

Antelope habitat in the Black Sage WSA would be only minimally affected. This unit does contain some high quality antelope spring, summer, and fall habitat and some stands of big sagebrush in an area that is rapidly losing big sagebrush stands to cereal grain cultivation. However, the impact of most land use activities in this area can be mitigated through standard operating procedures.

Moose. Riparian habitat quality strongly reflects moose habitat quality especially during the winter, and the extensive riparian surveys were used to evaluate moose habitat (see also the riparian habitat discussion in this chapter).

The summer/fall moose habitat is mostly mixed spruce-fir and mesic habitats in satisfactory condition. However, the majority of the moose habitat in the resource area is winter/spring habitat, and this alternative would have little overall beneficial impact on the quality of moose winter/spring habitat. Moose habitat quality would increase only from 40% unsatisfactory to 34% unsatisfactory (see Table 4-4). Four allotments out of twelve that contain substantial moose habitat would improve in condition, while the remaining eight would show little change in riparian habitat quality. Improved browse availability and plant vigor would occur on 4.2 miles of riparian habitat on four allotments because they are first priority I allotments, stocking rates are being reduced, and riparian habitat objectives are being incorporated into the allotment objectives. Moose winter/spring habitat quality on 15.4 miles of riparian habitat would show very little change in condition. Almost 50% of this habitat occurs on two allotments where livestock grazing management is not considered to be consistent with riparian habitat management.

Waterfowl. Under this alternative, the current 21% unsatisfactory habitat would significantly improve to 5% unsatisfactory (see Table 4-4) through improvement projects and livestock grazing systems that include waterfowl habitat objectives. Four allotments with the majority of the waterfowl habitat will be reduced by 247 AUMs and will be designed to provide residual nesting cover. Continuous seasonlong livestock grazing has been shown to reduce the quality of waterfowl nesting and brood-rearing habitat. Gjersing (1975) and Munding (1976) found increased waterfowl production when residual herbaceous cover was available for waterfowl the spring following grazing and if grazing was delayed until incubation was completed.

Conclusion

Mitigation measures in the form of management guidelines for oil and gas exploration and development have been developed for grizzly bear, elk, mountain goat, and mule deer through the Rocky Mountain Front Wildlife Monitoring/Evaluation Program.

No further mitigating measures are deemed necessary beyond the Guidance Common to all Alternatives and application of standard operating procedures. There would be some residual con-

licts on seasonal wildlife habitat where sagebrush control projects are implemented.

In the short-term, wildlife forage and cover would decrease on sagebrush control projects. This alternative proposes only 300 acres to be treated, thus, the short-term impacts would be minimal. These minimal impacts would be further lessened over the long term as vegetation reestablishes.

Aquatic habitat would improve from 62% satisfactory to 87% satisfactory. Similarly, riparian habitat would improve from 72% satisfactory to 86% satisfactory (I allotments and M and C allotments combined).

X The short-term ~~78%~~ ^{7%} reduction in livestock AUMs, implementing livestock grazing systems with riparian/aquatic habitat improvement objectives on the thirty-six first priority I allotments, and utilizing standard operating procedures would all provide beneficial impacts.

Terrestrial habitat would improve to varying degrees depending on the seasonal habitat in question (see Table 4-4).

Threatened or endangered species habitat would improve or be maintained in satisfactory condition through livestock grazing management that incorporates habitat improvement objectives, oil and gas leasing stipulations, special forestry management considerations, vehicle access restrictions, and habitat improvement projects. Of particular importance is grizzly bear habitat on the Rocky Mountain Front, which would improve from 60% satisfactory to 90% satisfactory over the long term.

Seasonal big game habitat would similarly improve by 10.8% overall. Beneficial impacts would result through a 7% short-term reduction in livestock AUMs, incorporating big game improvement objectives into implemented grazing plans, special stipulations applied to oil and gas exploration and development, habitat improvement project implementation, and standard operating procedures. Big game populations should increase somewhat as a result of improved habitat through numbers are very difficult to estimate.

Impacts on Social and Economic Conditions

All of the public land in the Rocky Mountain Front is currently leased for oil and gas exploration. The potential for gas discoveries in the area is high. In general, the more stipulations required in a lease, the greater the cost of locating a well. However, drilling in the Rocky Mountain Front area is expensive relative to drilling in other areas in any case. Of more concern to oil and gas companies is the area

that is leased with no surface occupancy stipulations or where leasing is denied. In this alternative, 11% of the area is leased with no surface occupancy and 10% is a lease denial area. The relationship between the amount of acreage available to explore and the amount of oil or gas forgone is unknown. Appendix O shows the possible economic impacts associated with different levels of development.

This alternative would entail short-term changes in stocking rates for twenty-six of seventy-seven I allotments in the resource area. Of these twenty-six, nineteen would be reduced an average of nearly 40% and seven would be increased.

The effects of these changes are of different magnitudes depending on ranch size and their dependency on BLM grazing permits. Ranch budgets were developed for various ranch sizes and maximum and minimum changes in AUMs were converted to cow numbers based on a seven month grazing season. The affect of changes made under Alternative A are shown in Tables 4-5 and 4-6. These findings may overstate the actual situation for some ranches since many of the AUMs being cut have not been used in recent grazing seasons. In addition, those ranches in the smaller size classes are likely to have other outside income that is not considered in these ranch budgets. Outside income can come from outside employment, other businesses, or from other agricultural endeavors such as growing grain. Other costs of reductions in grazing permits include a reduction in ranch value equivalent to the value of the AUMs lost. While a grazing permit does not officially have a monetary value, studies have shown a value in the neighborhood of \$100 per AUM on the value of the base property is appropriate. Private grazing in Montana leases for approximately \$9 per AUM. Table 4-7 shows the number of permittees affected by changes under this alternative and the average dependency on BLM by size class. Under this alternative the reductions shown would be short-term impacts, and AUMs would be restored as range conditions improve. Exact changes by ranch size class cannot be shown at present, since the information on long-term range changes was derived from aggregate information of all allotments by range site.

The magnitude of some of the changes in AUMs could affect the economic viability of ranches, particularly in the lower size classes. At present, most agricultural operations are facing high production costs and low prices for their products. In reaction to a further reduction in income, individual ranches may be forced to find outside employment or to cease ranching altogether. This would mean a major change in the lifestyle of these people. Con-

TABLE 4-5
CHANGES IN INCOME FROM REDUCTIONS IN STOCKING RATES: ALTERNATIVE A

| Ranch Size (cows) | Highest Reductions | | | Lowest Reductions | | | Present Income (dollars) |
|-------------------|--------------------------------|-------------------|----------------------------|--------------------------------|-------------------|----------------------------|--------------------------|
| | Change in Stocking Rate (cows) | Income* (dollars) | % Change in Present Income | Change in Stocking Rate (cows) | Income* (dollars) | % Change in Present Income | |
| 0-100 | -25 | -113.75 | -103.2 | -0 | 3,553.00 | 0 | 3,553.00 |
| 101-250 | -26 | 13,699.75 | -24.1 | -5 | 17,206.19 | -4.6 | 18,041.14 |
| 251-500 | -47 | 31,207.50 | -21.3 | -4 | 38,941.91 | -1.8 | 39,661.39 |
| 501-1,000 | -36 | 98,612.69 | -5.9 | -14 | 102,386.37 | -2.3 | 104,787.77 |
| More than 1,000 | -16 | 171,573.01 | -1.6 | -16 | 171,573.01 | -1.6 | 174,313.01 |

*These figures are net income over variable costs and do not reflect fixed costs, depreciation and returns on land investment.

TABLE 4-6
CHANGES IN INCOME FROM INCREASES IN STOCKING RATES: ALTERNATIVE A

| Ranch Size (cows) | Highest Increases | | | Lowest Increases | | | Present Income (dollars) |
|-------------------|--------------------------------|-------------------|----------------------------|--------------------------------|-------------------|----------------------------|--------------------------|
| | Change in Stocking Rate (cows) | Income* (dollars) | % Change in Present Income | Change in Stocking Rate (cows) | Income* (dollars) | % Change in Present Income | |
| 0-100 | +44 | 7,959.60 | +12.4 | +14 | 4,955.10 | +39.5 | 3,553.00 |
| 101-250 | +17 | 20,707.93 | +14.8 | +17 | 20,707.93 | +14.8 | 18,041.14 |
| 251-500 | +17 | 42,157.67 | +6.3 | +8 | 40,836.11 | +3.0 | 39,661.39 |
| 501-1,000 | +17 | 107,334.03 | +2.4 | +17 | 107,334.03 | +2.4 | 104,787.77 |
| More than 1,000 | +2 | 174,612.01 | +0.17 | +2 | 174,612.01 | +0.17 | 174,313.01 |

*These figures are net income over variable costs and do not reflect fixed costs, depreciation and returns on land investment.

TABLE 4-7
IMPACTS ON PERMITTEES: ALTERNATIVE A

| Size Class | Number of Permittees Receiving Increases | Average Dependence (%) ¹ | Number of Permittees Receiving Decreases | Average Dependence (%) ¹ |
|------------|--|-------------------------------------|--|-------------------------------------|
| 1 | 2 | 27.3 | 2 | 38.4 |
| 2 | 1 | 42.5 | 5 | 34.3 |
| 3 | 3 | 27.1 | 8 | 20.4 |
| 4 | 0 | — | 7 | 16.2 |
| 5 | 1 | 2.1 | 1 | 8.4 |

¹Dependency is defined as the percentage of a rancher's total AUMs that is supplied by public land.

versely, those allotments receiving increases on their BLM permits may be given enough breathing room to survive the present economic situation without having to further change their lifestyle.

The incomes shown in Tables 4-5 and 4-6 do not take into account family labor costs, depreciation, or interest on land and equipment. Therefore, actual usable income from these operations would be less than that shown in Tables 4-5 and 4-6. Ranch budgets used for this analysis are shown in Appendix P.

Under this alternative no areas would be recommended for wilderness designation. Therefore, there would be no changes in the current social and economic conditions of the area.

This alternative would make available for harvest 2.645 mmbf per year. This figure is based on the initial inventory of the timber resources in the Headwaters Resource Area. Assuming an average of eight jobs per million board feet of timber harvest, twenty-one jobs would be created at this level of harvest. It should be pointed out that due to lack of inventory, manpower, and market conditions this volume of timber has not been regularly harvested in the past. The present condition of the forest products industry will probably mean that demand will not be sufficient to justify harvest at this level in the near future. As the economy and the housing markets come out of recession, demand for timber will increase, making it more likely that timber would be harvested at the 2.645 mmbf level in the future.

The social and economic consequences of changes in the land ownership pattern vary with the type of adjustment (sale, exchange, or sale with preference), the length of time over which adjustments are made, and the magnitude of such adjustments. The relative magnitude of these effects are shown in Table 4-8.

Table 4-8 was constructed to show the relative magnitude of impacts given different levels of adjustment and the time frame over which those adjustments would be made. Additional analysis of impacts will be necessary when a specific land adjustment program is developed and specific tracts are identified.

If BLM tracts are sold, ~~they would generally be sold at fair market value to the highest bidder. Placing tracts for sale in this manner~~ would put pressure on adjacent landowners to bid for the property in order to maintain their current use of these tracts. However, at present, many farmers and ranchers are not in good financial shape and their ability to borrow, in many cases, is already strained. A possible way to mitigate the effects on adjacent landowners would be to provide for sale

with preference given to current users of the tract. The preference could include selling the tracts to current users at less than fair market values, providing government loans to current users, allowing extended pay back periods for current users, or other methods. This would reduce the financial impacts on holders of preference privileges and put more of the tracts in the hands of those who currently use them. Problems with this method include determination of preference on tracts that have more than one user, a reduced opportunity by others in the population to purchase those tracts, and a reduced return to the federal treasury.

Both sale types would reduce the area that the BLM manages, and thereby reduce some of the BLM's management costs in the area.

Land exchanges would tend to block up BLM-administered lands making them easier to manage. The major impact on adjacent landowners would be the possible loss of current use privileges.

Changes in public ownership of land in a county would affect payments in lieu of taxes paid to the counties, which among other things, are based upon federal acreage in the county.

Under this alternative the possibility of development of a mine in any part of the Scratchgravel Hills would remain. At present, there is some gold mining activity in the hills. This activity has created some conflicts between the mining company and local residents, primarily because of increased truck traffic on area roads. Under this alternative the possibility exists that this type of conflict would increase with increased mining.

The primary demand for a motorcycle race area on BLM-administered land is in the Helena-Townsend area. This alternative would restrict the areas open to consideration. Both the Scratchgravel Hills and the Limestone Hills have had requests for motorcycle races in the past. Local opposition to races in these areas has been quite high. The private land near the Scratchgravel Hills has been subdivided and is becoming suburban in character. Thus, the scheduling of race events in the surrounding hills would cause greater social disruption and opposition than it has in the past.

The situation in the Limestone Hills is slightly different than that in the Scratchgravel Hills. In this area the National Guard has a training area where an extensive investment in facilities has been made. Possible conflicts with this use and local opposition to these events could cause conflicts.

TABLE 4-8
SOCIAL AND ECONOMIC EFFECTS OF LAND OWNERSHIP ADJUSTMENTS

| Type of Adjustment | Type of Impact | Size and Timing of Adjustment | | | |
|----------------------|---|---|---|---|---|
| | | Less than 5,000 acres ¹ over less than 5 years | Less than 5,000 acres ¹ over more than 5 years | More than 5,000 acres ¹ over less than 5 years | More than 5,000 acres ¹ over more than 5 years |
| Sale | Individual impacts on adjacent owners | High | Moderate | High | Moderate |
| | Reduction in area requiring BLM management | Low | Low | Moderate | Moderate |
| Sale with preference | Loss of opportunity to buy property at a lower rate by those that don't have preference | Low | Low | Moderate | Moderate |
| | Reduced financial impact on preference holder to purchase land | Low | Low | Moderate | Moderate |
| | Reduction in area requiring BLM management | Low | Low | Moderate | Moderate |
| Exchange | Possible loss of privileges by current permittees or fees charged for land use | High | Moderate | High | Moderate |
| | Blocking up of BLM managed land | Low | Low | Moderate | Moderate |

¹Resource areawide

The effect of eliminating the sites mentioned above is that other parts of BLM-administered land in the Helena area are more likely to be considered for motorcycle race events. This would mean that the noise and crowd control problems, as well as the increased local business activity, of such an event may occur in some other part of the Helena-Townsend area.

The social and economic consequences of restrictions on motorized vehicle use can be divided into two groups, those in areas where motor vehicle use now occurs and those areas where it does not occur. In areas where restrictions would be placed on vehicle use that presently occurs, some social and economic impacts would occur. Leasees of the public lands, such as ranchers and mineral interests, may see increased costs during part or all of the year, because of the need for nonmotorized access to the land. Some of this increased cost

can be mitigated through scheduling of activities. The character of recreational use would change, adversely impacting those who use motor vehicles while benefitting those who prefer nonmotorized forms of recreation.

In those areas presently not used by motorized vehicles, the future opportunity to open an area to development activities such as timber harvest or to vehicle use would be limited. In order to fully assess the tradeoffs involved in a road closure or travel restriction, a more detailed analysis will be needed on a site-specific basis at the time such restrictions are proposed.

The establishment of avoidance areas and windows could cause a utility or transportation corridor to take a longer route, and thus increase the cost of construction. In addition, the combination of exclusion areas, avoidance areas and windows

could cause corridors to be routed closer to inhabited areas, which could increase the social impacts on local residents. The actual impact of designating exclusion areas, avoidance areas, and windows cannot be assessed further without specific details of a proposed corridor. The social and economic effects of avoidance areas and windows in the Rocky Mountain Front area are probably very small since the topography and the land use patterns do not lend themselves to routing a corridor on BLM-administered land.

Making federal coal available for further leasing consideration would not have an immediate economic impact on the area. Before a leasing decision could be made, further detailed studies of the area would be required. To date, the level of interest in the federal coal in this area has been low. The further study of the federal coal lands in this area will not take place until an application to lease is received. For illustrative purposes, Appendix Q shows possible economic impacts in Cascade County of coal development at a level that could supply Montana Power Company's proposed Salem Project. The other counties assessed in the E/D model for coal development showed either no changes or very minor changes in employment. The basic assumption for this model is the development of three underground mines southeast of Great Falls.

Social impacts that would occur, if coal were developed, would come from an influx of population. The impact of a population influx would be lessened if local labor could be used in the mines. The major impacts of a population increase would be on the supply of housing, the capacity of local schools, and the water and sewage systems of local communities. The proximity of Great Falls to this area would reduce some of these impacts, since there is some available capacity for growth in Great Falls. This analysis could be different if the construction of the Salem plant was taking place at the same time.

At the present time, it is difficult to assess how likely the development of federal coal would be in this area. There are several reasons for the difficulty. The coal has a high BTU content, which is attractive, but also a relatively high sulphur and ash content, which are not desirable for power plants. The coal is in small beds that would require underground mining. This method is more expensive than strip mining. It has not been demonstrated that coal from this area could compete economically with the lower BTU strip-mined coal from eastern Montana.

Under this alternative the areas of Blind Horse Creek, Chute Mountain, Deep Creek/Battle Creek, and Ear Mountain would be proposed for

designation as Outstanding Natural Areas. The management of these areas would allow the use of vehicles under very limited circumstances. This type of restriction could increase the cost to the permittee to use the area to move livestock and maintain range improvements. The use of horses would increase the time required for these activities and could require an increase in the labor needed to maintain these areas. Some of these additional costs could be mitigated through careful scheduling of vehicle use and tasks. This would require much more planning on a rancher's part. Resistance to this type of scheduling could be very great.

Another impact of designation of these areas as ONAs would be to oil and gas exploration and development. Much of these areas would either be leased with no surface occupancy or, in the core of each area, leases would be denied. The lease denial area amounts to approximately 18,550 acres, or 16% of the total public land area along the Rocky Mountain Front. Due to very limited drilling experience near or on the public land in the Rocky Mountain Front, it is not currently possible to estimate the number of barrels of oil or mcf of natural gas lost to the economy due to these restrictions. Even if this alternative were not selected, at least 10,950 acres would be closed to drilling for protection of resource values such as endangered species habitat.

Timber in these areas is classified as woodland. Under this alternative 1,750 acres of woodland would not be available for the harvest of forest products. At present, haul distances to prospective mills would limit harvest of this timber in any case.

Public interest on a national scale for resources on the Rocky Mountain Front is very high. This is primarily due to the high potential for oil and gas in the area, the presence of the threatened grizzly bear, the presence of the largest bighorn sheep herd in the lower forty-eight states, and the proximity to the Bob Marshall Wilderness. Many groups and individuals who are interested in the management of the RMF would regard the Outstanding National Area designation as official recognition of the importance of the RMF.

This alternative also would propose for ACEC designation the Sleeping Giant area, from the Missouri River to Sheep Creek. As an ACEC, management of the area would include restrictions on vehicle use in the area and could mean restrictions on dispersed camping along the Missouri River. Other uses would include wildlife habitat management and livestock grazing. The main objective of management will be to prevent resource damage

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due to intensive use and protect wildlife from seasonal disturbance in specific parts of the area.

At present, this area is very popular for water based recreation on the Missouri River and Holter Lake. Designation and management of the area as an ACEC could increase the demand on the recreational resource. There are currently several businesses including two marinas, a bar, and a restaurant that would benefit from this increased recreation activity. Depending upon the amount of increased use, new businesses could appear in the area near Holter dam outside the ACEC area to service this increased visitor use.

Changes in current grazing and timber management are not expected over what would occur in the no action alternative.

Conclusion

The effects of designating motorcycle use areas could be mitigated to some extent by having BLM input into the scheduling and policing of events. This would tend to reduce opposition from adjacent landowners, but would by no means completely eliminate opposition.

Closing some areas to ORV use could be mitigated if other areas could be provided for this use. It would not, however, satisfy those who wish unlimited access to the public land. Education of ORV participants would also help reduce conflicts between adjacent landowners and ORV participants.

Many of the economic impacts discussed in the grazing management section would occur over the short term. As grazing conditions improve, some of the AUMs lost initially could be restored for livestock grazing.

Even if the mitigating measures proposed for land adjustments are followed, some adjacent landowners will be impacted. Many adjacent landowners will not be able financially to purchase public land even with extended payment plans. Therefore they will run the risk of losing their grazing on the public land or would likely face substantially higher fees for that grazing.

The impact of land adjustments would primarily occur in the short term. Over the long run, most adjacent owners could adjust to the changing situation, provided they are able to make it through the short-term impact period.

Overall, Alternative A would lead to short term income losses of up to \$8,400 per year by individual grazing permittees. In the long term, aggregate productivity under this alternative would increase. Those permittees receiving increases would see income additions of up to \$4,400 per year.

Timber harvest levels of 2.645 mmbf would provide 21 jobs throughout the resource area if the allowable cut is harvested. This compares to the present situation of 100 mbf and approximately one job.

In the short term, grazing permittees facing reductions would experience a loss in permit value, and for those losing active AUMs, a reduction in income.

Under this alternative, those who currently use motorized vehicles on public land in the resource area may experience a perceived loss of freedom as areas are closed to vehicle use.

ALTERNATIVE B: NO ACTION

Impacts on Air Quality

Since no federal coal would be leased under this alternative there would be no impacts on air quality from coal development. Impacts to air quality from oil and gas exploration and development would be the same as for Alternative A.

Impacts on Soil and Water Resources

The impacts on soil and water resources would be essentially the same as for Alternative A, since standard operating procedures would be followed under all alternatives.

Impacts on Energy and Minerals

This alternative provides for 95,620 acres (81%) where surface occupancy is allowed. Only 7,200 acres (6%) are recommended for no surface occupancy and 15,430 acres (13%) are recommended for lease denial, based on the discussion under Alternative A. The acreage figure for no surface occupancy for this alternative is deceptive. As old leases expire and enter the simultaneous drawing system, they will come to the District Office for review, as outlined in the Butte District Oil and Gas Leasing EA. Stipulations attached through the procedures outlined in the EA would likely limit occupancy to approximately one-half of the figure given above.

This alternative would have the short-term impact of preventing exploration for, and development of, approximately 126 million tons of federal coal in the Great Falls Coal Field. Because the coal contains a high percentage of ash, has high sulfur levels, and is not evenly distributed, there is little demand for the coal at this time. Thus, in practical

terms the impact of not making the coal available at this time would be small.

No Outstanding Natural Areas would be designated along the Rocky Mountain Front under this alternative, which would make it possible to more thoroughly explore and develop the oil and gas resources of the area.

Conclusion

The short term impacts of this alternative are limited. Oil and gas and other minerals will be available as demand dictates. The long term impact may be the loss of potential production from areas in the RMF that have high potential for natural gas and the loss of some potential coal production from the Great Falls Coal Field. Oil and gas in the area outside the RMF and other minerals would be available as demand dictates.

Impacts on Lands

This alternative would prevent any improvement, through land tenure adjustments, of the current land ownership pattern. All the positive benefits of both acquisition and disposal would be precluded. Land would still be available for public purposes under the R&PP Act. The only method remaining for the authorization of agricultural and residential trespasses would be by lease, which could be more of an economic burden on the users.

Impacts on Recreation Resources

Impacts from oil and gas leasing, grazing allotment management, riparian habitat management, wilderness recommendations, forest management, land ownership adjustment, and mineral development would be essentially the same as for Alternative A, although the quality of primitive recreation opportunities along the Rocky Mountain Front could be significantly diminished from the present situation if road construction and drilling occurs in the Blind Horse Creek, Chute Mountain, and Deep Creek/Battle Creek areas.

Motorcycle events may be held in areas, such as the Scratchgravel Hills, and Limestone Hills, that would be closed under the other alternatives. This may displace some of the existing use that is not compatible with motorcycle events. At the same time, the overall organized use of motorcycles may increase because of the availability of desirable sites in which to hold an event.

Recreation use would remain at about the present level under this alternative. Motorized use would occur randomly throughout the resource area. Use will continue to be relatively light in most areas, with heavier use occurring in specific places

close to urban areas, such as the Scratchgravel Hills near Helena. Other recreational activities will increase at the present rate. At times, conflicts will arise between motorized and nonmotorized recreation or between different types of motorized activities. Some opportunities for motorized recreation will be eliminated due to emergency restrictions or closures.

Recreational use would continue at the present levels. Disruption of opportunities may occur in various places if corridors are established for utilities or transportation. This would cause a shift in use to areas that do not have corridors.

Since no Outstanding Natural Areas would be designated along the Rocky Mountain Front under this alternative, there would be no additional protection of primitive recreation opportunities. Recreation use and management would continue at present levels. In the Sleeping Giant area, the beneficial impacts of a special designation, as discussed under Alternative A, would not occur. There could be some potential for minor adverse impacts from timber harvesting and utility corridors, if these activities were to take place.

Conclusion

Impact from most uses would be essentially the same as for Alternative A. The quality of primitive experiences may be diminished in some places due to road construction, drilling, or other similar activities. Motorcycle use would benefit from increased opportunities, while other nonmotorized activities may be adversely affected.

Impacts on Visual Resources

Under this alternative, impacts on visual resources would be the same as for Alternative A.

Impacts on Cultural Resources

Impacts on cultural resources would be the same as for Alternative A.

Impacts on Wilderness Resources

The impacts from land ownership adjustments, motorcycle use areas, and utility and transportation corridors would be the same as for Alternative A.

Wilderness values would be adversely affected by recommending 17,197 acres in the five areas as unsuitable, since most of the surface would be open to long-term oil and gas occupancy. Impacts such as access roads, drilling sites, pipelines, and storage areas, although subject to other resource stipulations, would degrade the solitude and natu-

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ralness of the areas if undertaken. Short-term impacts could occur as well, and would be the same as discussed under Alternative A.

Impacts from grazing in Black Sage and the Yellowstone River Island would be the same as under Alternative A. Blind Horse Creek, Chute Mountain, and Deep Creek/Battle Creek would be subject to more impacts from grazing since management would be less restrictive. Mitigating stipulations governing the proposed installation of one spring development, three stock water tanks, three miles of water pipeline and one mile of fence would be less sensitive to the protection of wilderness values. Finally, increased impairment through the less restricted use of motorized vehicles for improvement, maintenance, and livestock supervision, could occur.

Nondesignation of all five areas under wilderness study (17,197 acres) would have major, long-term adverse impacts on the wilderness values, since these areas would be open to development. The diversity of the NWPS would not be enhanced, in that 2,062 acres of the under-represented Foothills Prairie ecotype would not be recommended for inclusion in the system.

Forest management would not affect wilderness values on the island as there are no commercial species to manage. Approximately 1,950 acres of low priority timber within the remaining four study areas would be available for harvest. Small localized sales of forest products would have some negative impacts on the naturalness and solitude of the areas.

Nondesignation of all five study areas would allow the public motorized vehicle access. The island would be unaffected since motorized travel on the unit is not feasible. Motorized vehicle access would be restricted in the three areas on the RMF, but some impacts would still occur. Temporary visual and audible impacts, coupled with the more lasting surface disturbance, would adversely affect wilderness values. Motorized vehicle access would not be restricted in the Black Sage area, and the impacts in that area would be the same as for Alternative A.

The beneficial effects of special designations discussed under Alternative A would not occur.

Conclusion

No areas would be recommended for wilderness or any special designation. This means that wilderness values will be open to more short and long-term impacts. While undue degradation will be mitigated by standard procedures, irreversible impairment of wilderness values from oil and gas activities, timber harvesting and, in some areas, ORV uses could take place.

Impacts on Timber Resources

There would be 52,902 acres of commercial forestland in the harvestable base and 18,940 acres of woodland would be available for limited harvest. This would make some additional sawtimber, fuelwood, and minor forest products available to the public.

Impacts on Range Resources

Under this alternative, no short-term target adjustments in AUMs are proposed. Applications for nonuse, temporary nonrenewable use, and changes in season, kind, or class of livestock would be accepted and approved or disapproved on an annual basis. The long-term adjustments in AUMs are the same as those discussed for Alternative A. Table 4-9 summarizes the target grazing preference adjustments for this alternative.

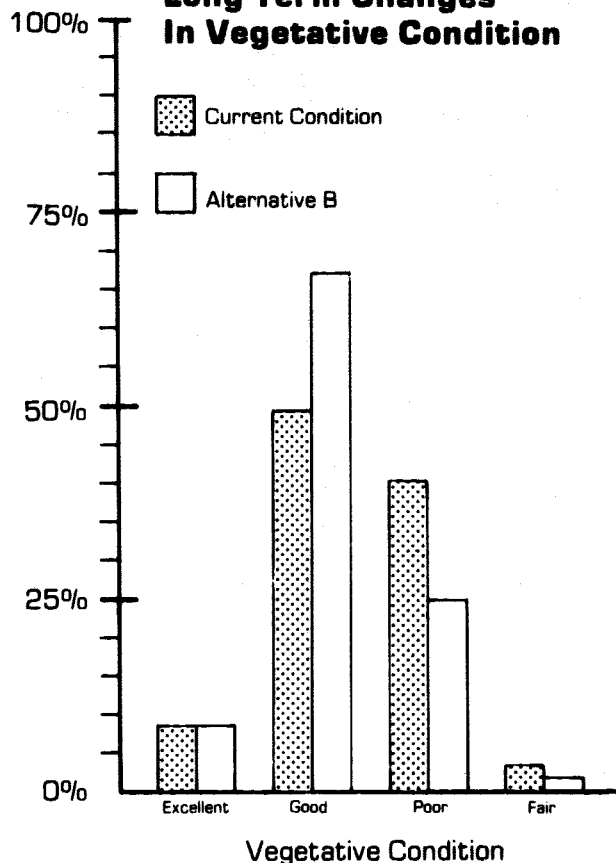
TABLE 4-9
CHANGES IN GRAZING PREFERENCE:
ALTERNATIVE B

| | Total AUMs | Change in Use AUMs | % |
|------------------------|---------------|-----------------------|------|
| Current Authorized Use | 31,501 | — | — |
| Short-Term Adjustment | 31,501 | 0 | 0 |
| Long-Term Adjustment | 33,417 | +1,916 | +6.1 |

Figure 4-3 illustrates the expected changes in vegetative condition in the long-term, and Table 2-5 summarizes the kinds and quantities of improvements and treatments planned under this alternative. These changes and improvements are the same as those proposed under Alternative A.

The short-term impacts on vegetative communities would be a continuation of present trends. Many of these changes are subtle and difficult to assess. In some allotments, however, reductions in the livestock use are recommended to meet the short term vegetation management objectives stated in Appendix E. In these instances, there would probably continue to be an undesirable change in vegetation. Because this alternative proposes no short-term change in present management practices, it has a negligible impact on livestock grazing. While the continuation of present management over the short-term may not be the most desirable alternative from the grazing permittee's or lessee's viewpoint, it would require the least change of any alternatives considered. The long-term impacts of this alternative would be the same as those discussed in Alternative A, since the adjustments proposed are the same.

FIGURE 4-3
Alternative B
Long Term Changes
In Vegetative Condition



Conclusion

Careful placement and design of range improvements and treatments can be used to lessen possible adverse impacts on vegetation and livestock.

The overall quality and quantity of vegetation produced on public land would improve in the long term. Although this alternative proposes no short-term downward or upward adjustments in grazing preference, a long-term increase of 6.1% in grazing preference is projected. Because no short-term downward adjustments are proposed, short-term management objectives that call for lower levels of forage utilization would not be met. Livestock operators would see no short-term changes in grazing management, but overall livestock production should improve over the long term. Both structural and nonstructural range improvements and treatments are proposed at an estimated cost of \$449,331. Through mitigation some potentially adverse long-term impacts can be avoided.

Impacts on Wildlife and Fisheries

Aquatic Habitat

Under this alternative, aquatic habitat on the RMF and the Yellowstone River Island would not be afforded additional protection and could be subject to adverse land uses. However, the potential for serious adverse impacts are low due to existing laws, regulations, and standard operating procedures that mandate nondegradation of aquatic habitat. Some offsite adverse impacts, such as erosion caused by surface disturbing activities upstream from these areas would remain possible.

Terrestrial Wildlife Habitat

Under this alternative, the beneficial effects of special designations identified under Alternative A would not occur, impacts from forest management activities would be the same as for Alternative A, and major big game wintering habitats could be impacted from utility and transportation corridors.

The impacts on wildlife and fisheries from oil and gas leasing would generally be the same as Alternative A. Although no areas would be designated as Outstanding Natural Areas, there would still be more acres zoned for no surface occupancy than the current situation. This would primarily benefit grizzly bear habitat. The degree of impact however, would be relatively minor.

The long-term impacts from grazing allotment management on wildlife and fisheries would be the same as for Alternative A. Over the short term there would be minor adverse impacts to mule deer, elk, and moose habitat.

Big game habitat on the RMF, Yellowstone River Island, and Black Sage units could be subject to adverse impacts because surface-disturbing land uses could potentially occur in all areas. The result of this could be a reduction in present habitat productivity. However, management opportunities for habitat improvement would remain feasible under nondesignation.

In addition to those impacts identified in Alternative A, summer mule deer habitat would be impacted in the Scratchgravel Hills and Limestone Hills. A small population of antelope in the Scratchgravel Hills could be significantly impacted, as could a small population of elk in the Limestone Hills.

Other terrestrial wildlife habitats in other geographical areas could be impacted to varying degrees (see Table 4-10). Primary impacts would be disturbance of summer use habitats, although some physical loss of vegetation could occur.

The impacts from motorized vehicle access under this alternative would generally be the same as for Alternative A. However, there would be an increased potential for impacts in the Limestone Hills and Scratchgravel Hills, particularly to mule deer.

Grizzly Bear. Under this alternative grizzly bear habitat on the RMF would not be afforded added protection and could be subject to adverse impacts. Oil and gas exploration and development activities are considered to have potential adverse impacts on grizzly bear habitat. However, grizzly bear habitat is adequately protected under this alternative by the stipulations that would be placed on oil and gas exploration and development activities.

Gray Wolf. Under this alternative gray wolf recovery habitat on the RMF would not be afforded added protection and could be subject to adverse land use impacts. The maintenance of viable, productive big game populations is essential to potential gray wolf recovery. Certain land uses such as oil and gas exploration and development and livestock grazing can result in adverse impacts on recovery habitat. This alternative would result in minor changes in livestock grazing practices and their impact on recovery habitat. Some adverse impacts could result to recovery habitat from oil and gas exploration and development activities under this alternative. However, recovery habitat is still adequately protected under this alternative by the stipulations that would be placed on oil and gas exploration and development activities.

Peregrine Falcon and Bald Eagle. Under this alternative bald eagle and peregrine falcon habitat would be subject to on-going land use activities. Any land uses that reduced or eliminated cottonwood trees on the Yellowstone River Island would reduce its value as bald eagle and peregrine falcon habitat. However, standard operating procedures are adequate with respect to maintaining and not jeopardizing the habitats of these species.

Riparian habitat, including habitat for the bald eagle could be impacted from utility and transportation corridors if major new facilities are built.

Conclusion

Mitigation measures in the form of management guidelines for oil and gas exploration and development have been developed for grizzly bear, elk, mountain goat, and mule deer through the Rocky Mountain Front Wildlife Monitoring/Evaluation Program.

No further mitigating measures are deemed necessary beyond those outlined under Guidance Common to all Alternatives and standard operating procedures.

There would be some residual conflicts on seasonal wildlife habitat where sagebrush control projects are implemented.

In the short term, wildlife forage and cover would decrease on sagebrush control projects. This alternative proposes only 300 acres to be treated, thus, the short-term impacts would be minimal. These minimal impacts would be further lessened over the long term as vegetation reestablishes.

Similar beneficial impacts to riparian and aquatic habitat would be realized as shown for Alternative A. Although short-term reductions in livestock AUMs would not occur, the implementation of the first priority allotments would occur with riparian and aquatic habitat improvement objectives incorporated. The implementation of these grazing plans coupled with utilizing standard operating procedures would provide long-term beneficial impacts.

Terrestrial habitat would improve to varying degrees depending on the seasonal habitat in question (Table 4-10). Threatened or endangered species habitat will improve or be maintained in satisfactory condition through livestock grazing management with incorporated improvement objectives, oil and gas leasing stipulations, special forestry management considerations, vehicle access restrictions, and habitat improvement projects. Of particular importance is grizzly bear habitat on the Rocky Mountain Front which would improve from 60% satisfactory to 90% satisfactory over the long term.

Seasonal big game habitat would similarly improve by 10.8% overall. Beneficial impacts would result through incorporating big game improvement objectives into implemented grazing plans, applying special stipulations to oil and gas exploration and development, implementing habitat improvement projects, and following standard operating procedures. Big game populations should increase somewhat as a result of improved habitat, although numbers are very difficult to estimate.

Impacts on Social and Economic Conditions

Under this alternative the impacts from wilderness study recommendations, forest management, mineral exploration and development, and motorized vehicle access generally would be the same as for Alternative A. Since this alternative would involve no change from the present situation, no changes in social and economic conditions from land ownership adjustments or special designations would occur.

This alternative is a projection of the acreage available for leasing if current policies and procedures are continued. Much of the acreage in the Rocky Mountain Front was leased in the early 1970s before the passage of the Federal Land Policy and Management Act in 1976, and before the Endangered Species Act of 1973, as amended. As these leases come up for leasing again in the 1980s, more areas will have special stipulations, and some areas will not be leased again. Given the present level of information about available reserves and their location, it is difficult to estimate the amount of oil or gas that would be forgone because of lease denials. Special stipulations and no occupancy provisions will add to the cost of exploration, but should not reduce the oil and gas reserves available for production. The increased cost of exploration could, however, reduce the amount of oil and gas that could economically be produced in the area.

An analysis of the effect of various levels of oil and gas development on local communities is shown in Appendix O.

Under this alternative, there would be no short-term adjustment in livestock grazing. Therefore, no short-term impacts would occur for this alternative. The long-term impacts would be the same as for Alternative A.

The opening of all public land to consideration for organized motorcycle events would likely create problems, particularly in the Scratchgravel Hills and the Limestone Hills areas. These two areas appear to be among the more favored areas for this type of race. They are also the areas where the most social disruption and opposition exist. One site in the Helena area near Montana City is already available for motorcycle events and under all alternatives this will remain available, although it is not suitable for all types of races. Local residents in the Scratchgravel Hills and Limestone Hills presently are not in a position to benefit economically from a race event, but adjacent landowners would suffer the costs created by noise and crowds.

Under this alternative the potential for the impacts from utility and transportation corridors that were discussed under Alternative A would be minor. The reason for this is that this alternative offers greater flexibility in siting and, therefore, a greater chance that the corridor would avoid populated areas.

The primary impacts associated with not making federal coal available for leasing would be the loss of new jobs and tax income should a mine be developed. The impacts of coal mining discussed under Alternative A would probably not take place if fed-

eral coal were not leased, but these impacts could occur if private coal was developed in the area.

Conclusions

Since this alternative represents the continuation of present management there would be only minor social and economic impacts associated with it.

ALTERNATIVE C: PROTECTION

Impacts on Air Quality

Since no coal would be leased under this alternative, there would be no impacts on air quality from coal leasing. The impacts from oil and gas development would be the same as for Alternative A.

Impacts on Soil and Water Resources

The impacts from utility and transportation corridors and special designations would be the same as for Alternative A. The impacts from coal leasing would be the same as for Alternative B.

Since more areas along the Rocky Mountain Front would be zoned for no surface occupancy, the impacts on soil and water resources would be minimal. In any area where oil and gas exploration or development did take place, the impacts would be the same as for Alternative A.

There would be a decrease in unsatisfactory watershed condition of approximately 3,000 acres because watershed, wildlife, and vegetative condition objectives would be met first on 1 allotments. Where supported by monitoring data, short-term downward adjustments in livestock use would be made to meet watershed objectives.

Wilderness designation would generally afford some additional protection for soil and water resources. However, if visitor use increased significantly as a result of wilderness designation, water quality could decline because of an increase in bacteriological contamination.

Soil and water resources would benefit under this alternative, because the protection and enhancement of key wildlife habitats would be given priority when developing timber harvesting plans. This in turn would benefit soil and water resources. Where timber harvesting took place, the impacts would be the same as for Alternative A.

Since a portion of the Scratchgravel Hills would be withdrawn from mineral entry under this alternative, the impacts to soil and water resources would be reduced. If development takes place on

existing claims or areas not withdrawn, the impacts would be the same as for Alternative A.

Soil and water resources would significantly benefit in the Limestone Hills, Spokane Hills, Scratchgravel Hills, and Marysville area under this alternative, because these areas would be closed to organized motorcycle events. Impacts in other areas would be the same as for Alternative A. Soil and water resources would also benefit in those areas with travel restrictions, such as the Scratchgravel Hills, Limestone Hills, and Hilger Hills. Impacts in other areas would be the same as for Alternative A.

Impacts on Energy and Minerals

The impacts from grazing allotment and riparian habitat management, forest management, land ownership adjustments, motorcycle use areas, utility and transportation corridors, and special designations (for Ear Mountain and the Sleeping Giant areas) would be the same as for Alternative A. The impacts from coal leasing would be the same as for Alternative B.

This alternative leaves 38,480 acres (32%) available for surface occupancy. A total of 38,980 acres (33%) would be leased with no surface occupancy stipulations, and leases would be denied on 40,790 acres (34%) as discussed under Alternative A. The acreage zoned for lease denial and no surface occupancy under this alternative could have a severe impact on natural gas exploration and production on BLM-administered land in the Rocky Mountain Front area.

There is a strong likelihood that the Blackleaf Gas Field extends under the northeast corner of the Blind Horse Creek unit. The potential for structural traps similar to those in the Blackleaf Gas Field is high throughout the Rocky Mountain Front. Designation of the Blind Horse Creek, Chute Mountain, and Deep Creek/Battle Creek areas as wilderness means that over the long term, much of this potential would be forgone. The potential for locatable grades of limestone and dolomite is high in the RMF study areas. However, the lack of nearby markets makes any development unlikely in the foreseeable future. Designation of these study areas as wilderness would mean the long-term loss of this potential.

The potential for oil and gas in the Black Sage WSA is moderate to high. Designation as a wilderness means that over the long term much of this potential would be forgone. The potential for locatable minerals is low; however, designation as wilderness would mean the long-term loss of this potential.

Designation of the Yellowstone River Island as wilderness would have no impact on either locatable or leasable minerals, because there is little likelihood of development on the island. Standard stipulations on oil and gas leases would not allow surface occupancy. The low potential for locatable minerals, combined with federal and state laws, would likely limit their development.

This alternative would have an adverse impact on mineral exploration and development on approximately 2,960 acres of public land by withdrawing that land from mineral entry. As shown in the Scratchgravel Hills Proposed Mineral Withdrawal map, the land withdrawn includes land with both moderate and low mineral potential, primarily for small deposits of gold and silver, possibly associated with copper, lead, and zinc. Valid existing rights would be protected, thus some mining activities might be allowed to continue.

Conclusion

In the short term there will be little impact on energy and minerals in the RMF because most of the area is already leased for oil and gas. In the long term there may be several areas with significant potential where no leases will be issued, and possible production of oil and gas would be forgone.

Since valid existing rights would be protected, short term impacts of a mineral withdrawal in the Scratchgravel Hills would be limited. Long-term impacts would be the loss of any potential production from lands with moderate to low potential in the withdrawn area.

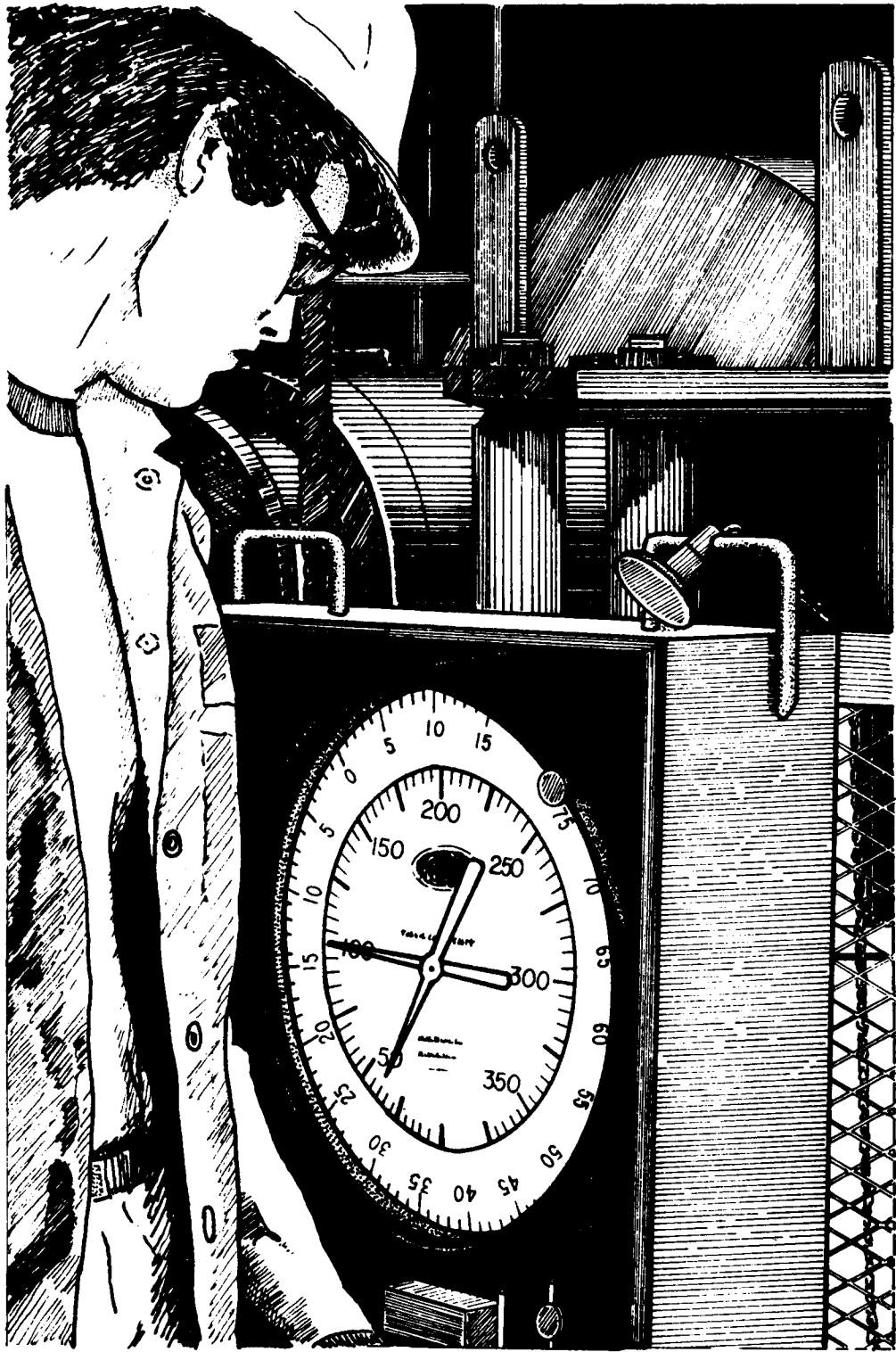
Overall, this alternative is very restrictive to energy and mineral exploration and development. Exploration and development would likely be restricted over both the short and long term in areas identified as wilderness or for withdrawal. Oil and gas outside of areas identified for wilderness would be available as demand dictates. The Great Falls Coal Field and other minerals outside the proposed withdrawal would also be available.

Impacts on Lands

The impacts on lands would be the same as for Alternative A.

Impacts on Recreation Resources

In general, the impacts from oil and gas leasing and development on recreation under this alternative would be the same as for Alternative A. Since more areas would be zoned for no surface occupancy under this alternative, nonmotorized types of recreation would receive added protection.



Wilderness designation would eliminate all forms of motorized recreation in all five areas being studied for wilderness. Because of topography and vegetation, Chute Mountain, Deep Creek/Battle Creek, and the Yellowstone River Island are not suited to motorized recreation and are currently receiving very little use. Although Blind Horse Creek has some areas that are suitable for motorized recreation, a lack of access currently is restricting such use. For these reasons, wilderness designation would have very little impact on motorized recreation in these areas. The Black Sage area does receive a fair amount of motorized recreation use, particularly during the fall hunting season. This use would be curtailed with wilderness designation.

All forms of primitive recreation would be protected and enhanced in all five areas if they are designated as wilderness.

The impacts on recreation from forest management would be similar to those discussed under Alternative A, but added restrictions on timber harvesting would benefit nonmotorized forms of recreation. Recreation resources would benefit from grazing allotment management because the protection of riparian habitat and vegetative condition would be given priority. The impacts from land ownership adjustments would be the same as for Alternative A.

Nonmotorized forms of recreation would benefit from withdrawing portions of the Scratchgravel Hills from mineral entry. In areas that are not withdrawn, the impacts would be the same as for Alternative A.

Under this alternative, the Limestone Hills, Scratchgravel Hills, Spokane Hills, Hilger Hills, Marysville area, Sleeping Giant area, and all areas being studied for wilderness would be closed to organized motorcycle events. This would essentially eliminate the opportunities on public land to hold motorcycle race events based out of Helena, except for in the Montana City area. Opportunities for nonmotorized types of recreation would be protected and/or enhanced in areas closed to motorcycle events.

Opportunities for motorized recreation would be reduced or eliminated in the Scratchgravel Hills, Limestone Hills, Hilger Hills and all areas being studied for wilderness. At the same time, opportunities for nonmotorized forms of recreation would be protected and enhanced in those same areas.

The effects of the special designation for Ear Mountain would be the same as under Alternative A. The effects of a Recreation Lands designation for the Sleeping Giant area would be similar to the

effects of ACEC designation (see Alternative A discussion), except that recreation would receive more emphasis, particularly over wildlife objectives. Management planning would focus on recreation, but it is doubtful that the type of development or services would be greatly different from those which would occur under Alternative A.

Conclusion

Overall, the impacts generally would be beneficial to nonmotorized recreation, although in some cases, impacts would be similar to those discussed under Alternative A. Opportunities for motorized recreation would be reduced or eliminated in a number of locations. Special designations would enhance recreation opportunities in specific areas, although development probably would not be significantly different than in Alternative A.

Impacts on Visual Resources

The impacts would be the same as for Alternative A.

Impacts on Cultural Resources

The impacts would be the same as for Alternative A.

Impacts on Wilderness Resources

Wilderness designation of all five areas (17,197 acres) would best insure the protection of wilderness values, since oil and gas occupancy would not be allowed over the long term. Short-term impacts could occur and would be the same as discussed under Alternatives A and B.

Wilderness designation of all five areas would prevent significant adverse impacts from grazing activities. Some minor impacts could still occur from range management actions that would be allowed under the BLM's Wilderness Management Policy.

Designation of all five study areas (17,197 acres) as wilderness would best insure the long-term protection of wilderness values and would enable the natural ecological processes to continue unimpeded. Wilderness protection would benefit the outstanding scenic and wildlife features of Blind Horse Creek, Chute Mountain, and Deep Creek/Battle Creek. The addition of 2,062 acres of the under-represented Foothills Prairie ecotype would enhance the diversity of the NWPS.

Since all five study areas would be designated as wilderness, no impacts would occur from forest management, motorcycle use areas, or utility and

transportation corridors. All wilderness areas would generally be closed to motorized vehicles, and consequently no associated impacts would occur. However, livestock operators would be granted motorized access on a case-by-case basis, in accordance with the guidelines in the BLM's Wilderness Management Policy.

The impacts from land ownership adjustments would be the same as for Alternative A.

Conclusion

All five areas (17,197 acres) are recommended for wilderness designation and as a result, natural protection would be best ensured over both the short and long term. The diversity of the NWPS would be enhanced by having approximately 2,062 acres of the under-represented Foothills Prairie ecotype added to it.

Impacts on Timber Resources

Under this alternative the amount of commercial forestland in the harvestable base would be the same as for Alternative B. However, an additional 2,950 acres of woodland would be set aside because of wilderness and special area recommendations. This would have only minor impacts on the availability of sawtimber, fuelwood, and other forest products.

Impacts on Range Resources

Under this alternative, a short-term reduction of 4,465 AUMs (14.2% of current authorized use) is proposed for thirty-four allotments. No allotments would receive an increase in AUMs.

In the long term, a reduction of 3,284 AUMs from current authorized use is proposed, which is an increase of 1,181 AUMs compared to the short term. This projection depends in part upon implementation of grazing systems, installation or removal of range improvements, and implementation of land treatments. While these actions are proposed primarily to benefit watershed, wildlife, and vegetative values, additional forage could be made available to livestock with no deleterious effects on these values. Table 4-11 summarizes the short and long-term changes proposed in current authorized use. Table 2-5 summarizes the kinds and quantities of improvements and treatments needed to place this alternative into effect.

There would be no control of poisonous or noxious plants under Alternative C. While some additional livestock forage may be produced as a result of timber harvesting, only the forage that was not needed for enhancement of watershed, wildlife, or vegetation values would be available for livestock, and only on a temporary nonrenewable basis.

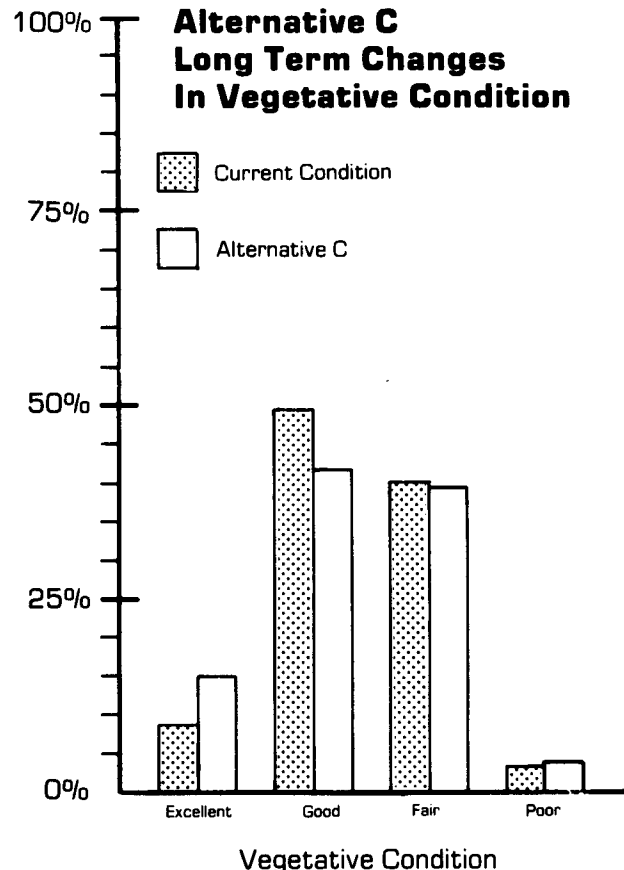
**TABLE 4-11
CHANGES IN GRAZING PREFERENCE:
ALTERNATIVE C**

| | Total AUMs | Change in Use AUMs | % |
|------------------------|------------|--------------------|------|
| Current Authorized Use | 31,501 | — | — |
| Short-Term Adjustment | 27,036 | -4,465 | 14.2 |
| Long-Term Adjustment | 28,217 | -3,284 | 10.4 |

The only significant short-term change in vegetation that would occur is a probable increase in vigor of preferred forage plants where AUM reductions result in less forage utilization by livestock.

Figure 4-4 illustrates the expected changes in vegetative condition in the long term. These projections are based upon the potential of the vegetative community that presently occupies a site to change in response to changes in grazing management. The assumption is made that the vegetative condition of sites in the M and C allotments would not change. The only land treatments proposed are 680 acres of burning and seeding. Resource area-wide, burning and seeding of these few acres would have a negligible effect on vegetation.

**FIGURE 4-4
Alternative C
Long Term Changes
In Vegetative Condition**



The major long-term effect on vegetation would be an increase in the number of acres presently in excellent and poor vegetative condition and a decrease in the acreage presently in fair and good vegetative condition. While the projection for an additional 1% of the acreage to be in poor condition when compared with the present may seem contradictory, it is based on the fact that Alternative C strives to achieve wildlife, watershed, and vegetative conditions simultaneously. In some cases, these objectives may not be compatible, since vegetative conditions are based on the departure of a plant community from ecological climax. For example in certain instances, the habitat provided by a climax plant community might not be as beneficial to wildlife as that provided by a seral plant community. Therefore, if you managed for the wildlife objectives, the vegetative condition might decline, because you would not be managing for the climax community.

This alternative proposes changes that would have impacts on livestock grazing in both the short and long term. Taking into account the nonuse taken for the past three consecutive years (1,999 AUMs) and the temporary nonrenewable use granted for the past three consecutive years (287 AUMs), a net reduction of 2,537 AUMs from average actual use would be imposed. Because thirty-one of the thirty-four allotments being reduced in AUMs would be reduced by more than 15%, the reductions would normally be phased-in over a five year period.

Appendix N displays the recommended short-term changes in AUMs for each allotment in the I category. The consequences of this proposal depend not only on the total amount of the reduction, but also on how grazing use in the allotment fits into the yearlong ranch operation, and what grazing management changes may be imposed, other than reducing the overall stocking rate. Even when the five year phase-in period is considered, this alternative would force permittees and leasees to either secure alternative pasture for their livestock or to reduce herd size. The alteration of approximately 76 miles of fence should not have any pronounced effect on livestock grazing.

Conclusion

The impact of the short-term target reductions of 4,465 AUMs is mitigated somewhat by the fact that BLM has issued annual licenses for nonuse that amounted to 1,999 AUMs during the 1980, 1981 and 1982 grazing seasons. This nonuse was granted in nine of the allotments proposed for reductions in AUMs under this alternative. The implication of consecutive years of nonuse is that either herd size has been reduced or that alternative pasture has been secured. On the other hand,

the impacts from the proposed reductions would be aggravated by the fact that temporary nonrenewable use of 287 AUMs has been granted over the past three years. Consecutive years of temporary nonrenewable use usually means that herd size has been increased or that alternative pasture is no longer available.

Modest improvements in the quality and quantity of vegetation produced on public land are projected in the long term. The short and long-term reductions in AUMs would result in a decrease in livestock production on public land.

The native vegetation on the 440 acres proposed for reseeding would be replaced by other plant species. It would be unlikely that a native plant community would again occupy the site.

Overall, there would be a modest improvement in the quantity and quality of vegetation produced on public land. A short-term downward adjustment of 4,465 AUMs (14.2% of current authorized use) is proposed. The target long-term allocation to livestock would restore 1,181 AUMs of the 4,465 AUM decrease as proposed at an estimated cost of \$247,659.

Except for phasing in most of the reduction in AUMs over a five year period, very little can be done to mitigate the adverse impacts these reductions will have on livestock operators.

Impacts on Wildlife and Fisheries

The impacts from land ownership adjustments and motorized vehicle access would generally be the same as under Alternative A, except that there would be beneficial impacts to wildlife habitat in the Hilger Hills as well.

Aquatic Habitat

All aquatic habitat would be fully protected by placing a priority on management actions that maximize wildlife, watershed, and vegetative conditions. The aquatic habitat would improve both in the short-term and the long-term as management objectives in grazing allotments are aligned with the monitoring and inventory data. The satisfactory condition habitat would increase from 58.1 miles currently to 92.3 miles (Table 4-12). The remaining 1.9 miles would be in unsatisfactory condition regardless of management activities.

All aquatic habitat in the areas being studied for wilderness would be protected from potentially adverse land uses. Three miles of cold-water fishery on the RMF and approximately 1.0 mile of shoreline on the Yellowstone River are involved in these areas. The Yellowstone River, in the vicinity of the island, is a Class I, highest value fishery

4 — ENVIRONMENTAL CONSEQUENCES

**TABLE 4-12
LONG-TERM WILDLIFE HABITAT CHANGES RESULTING FROM GRAZING ALLOTMENT AND RIPARIAN HABITAT
MANAGEMENT: ALTERNATIVE C¹**

| Type of Habitat | Current Condition | | Alt. C | | Type of Habitat | Current Condition | | Alt. C | |
|-------------------------------------|-------------------|------|---------|-----|----------------------------------|-------------------|----------|--------------|----------|
| | Acres | % | Acres | % | | Acres | % | Acres | % |
| Elk-wt/sp | | | | | Antelope-wt/sp | | | | |
| Satisfactory | 51,759 | 77.6 | 3,351 | 95 | Satisfactory | 10,452 | 78 | 12,037 | 89 |
| Unsatisfactory | 14,926 | 23 | 3,334 | 5 | Unsatisfactory | 3,072 | 22 | 1,487 | 11 |
| Elk-su/fa | | | | | Antelope-su/fa | | | | |
| Satisfactory | 19,896 | 77 | 24,011 | 93 | Satisfactory | 10,921 | 77 | 12,195 | 86 |
| Unsatisfactory | 5,922 | 23 | 1,807 | 7 | Unsatisfactory | 3,259 | 23 | 1,985 | 14 |
| Elk-yearlong | | | | | Antelope-yearlong | | | | |
| Satisfactory | 6,678 | 75 | 8,291 | 94 | Satisfactory | 15,618 | 79 | 18,045 | 91 |
| Unsatisfactory | 2,142 | 25 | 529 | 6 | Unsatisfactory | 4,212 | 21 | 1,785 | 9 |
| Mule deer-wt/sp | | | | | Waterfowl-sp/su/fa | | | | |
| Satisfactory | 82,147 | 75 | 102,200 | 93 | Satisfactory | 1,975 | 79 | 2,500 | 100 |
| Unsatisfactory | 27,763 | 25 | 7,710 | 7 | Unsatisfactory | 525 | 21 | 0 | 0 |
| Mule deer-su/fa | | | | | Grizzly-yearlong | | | | |
| Satisfactory | 9,135 | 90 | 9,643 | 95 | Satisfactory | 12,882 | 60 | 20,510 | 95.5 |
| Unsatisfactory | 1,015 | 10 | 507 | 5 | Unsatisfactory | 8,588 | 40 | 960 | 4.5 |
| Mule deer-yearlong | | | | | | | | | |
| Satisfactory | 38,009 | 78 | 45,618 | 94 | | | | | |
| Unsatisfactory | 10,521 | 22 | 2,912 | 6 | | | | | |
| Bighorn sheep-wt/sp | | | | | | | | | |
| Satisfactory | 5,095 | 83 | 5,946 | 97 | | | | | |
| Unsatisfactory | 1,035 | 17 | 184 | 3 | | | | | |
| Bighorn sheep-su/fa | | | | | | | | | |
| Satisfactory | 9,317 | 92 | 9,697 | 96 | | | | | |
| Unsatisfactory | 783 | 8 | 403 | 4 | | | | | |
| Bighorn sheep-yearlong ² | | | | | | | | | |
| Satisfactory | 12,160 | 100 | 12,160 | 100 | | | | | |
| Unsatisfactory | 0 | 0 | 0 | 0 | | | | | |
| Moose-wt/sp | | | | | | | | | |
| Satisfactory | 5,832 | 60 | 8,897 | 92 | | | | | |
| Unsatisfactory | 3,888 | 40 | 823 | 8 | | | | | |
| Moose-su/fa | | | | | | | | | |
| Satisfactory | 5,012 | 88 | 5,645 | 98 | | | | | |
| Unsatisfactory | 748 | 12 | 115 | 2 | | | | | |
| | | | | | | Miles | % | Miles | % |
| | | | | | Fisheries- | | | | |
| | | | | | Satisfactory | 58.1 | 62 | 92.3 | 98 |
| | | | | | Unsatisfactory | 36.1 | 38 | 1.9 | 2 |
| | | | | | Long-term riparian habitat | | | | |
| | | | | | cond. on I Allot. ³ | | | | |
| | | | | | Satisfactory | 35.75 | 51 | 68.05 | 98 |
| | | | | | Unsatisfactory | 33.95 | 49 | 1.65 | 2 |
| | | | | | Long-term riparian habitat | | | | |
| | | | | | cond. on M&C Allot. ³ | | | | |
| | | | | | Satisfactory | 67.45 | 93 | 71.0 | 98.4 |
| | | | | | Unsatisfactory | 4.75 | 7 | 1.2 | 1.6 |

¹All terrestrial wildlife species information is shown in acres and percentages.

²This yearlong habitat is in the Devils Kitchen and portions of the Sleeping Giant areas that are predominantly inaccessible to domestic livestock.

³Condition of riparian habitat in 20 years with the first priority I allotments fully implemented.

resource. The streams on the RMF are a Class III, substantial fishery resource.

All aquatic habitat would be fully protected from impacts caused by oil and gas exploration and development.

Riparian Habitat

Under the protection alternative riparian habitat conditions would improve substantially from the current 51% satisfactory to 97.6% satisfactory for the I allotments (Figure 4-2). Satisfactory riparian condition would similarly improve from the current 95% satisfactory to 98.4% satisfactory for the M and C allotments (see Figure 4-2). Under this alternative approximately 35.9 miles of stream would be excluded from livestock grazing, primarily by fencing.

All riparian habitat would be protected from impacts caused by oil and gas exploration and development.

Terrestrial Wildlife Habitat

Wilderness designation of all five areas being studied would protect all seasonal big game habitat on the RMF, Yellowstone River Island, and Black Sage units from surface disturbing activities. However, some wildlife habitat improvement opportunities, such as prescribed burning, would be forgone. Prescribed burning in the juniper-limber pine belt on the RMF, for instance, could substantially improve bighorn sheep habitat, because as plant succession moves toward climax stages, bighorn sheep habitat diminishes in productivity. However, the same result could be achieved if a let burn policy was adopted for these areas.

The elimination of surface disturbing activities would substantially benefit the long-term productivity of big game habitat.

The impacts of harvesting an average of 880 acres of commercial timber each year would vary depending on the harvest method, season, duration of activity, and location of the cutting unit. The application of the Montana Cooperative Elk-Logging Study Guidelines (see Management Guidance Common to all Alternatives) and standard operating procedures would significantly lessen adverse impacts. Setting aside approximately 6% of the commercial timber base for wildlife habitat protection further minimizes these adverse impacts. Setting aside the timber in the Scratchgravel Hills would have minor beneficial impacts to terrestrial habitat.

Significant beneficial impacts would occur by placing highest priority on the protection or enhancement of key mule deer and elk habitat. The most significant benefits of this would be realized in the Elkhorn forest management unit. Beneficial

impacts in the form of increased forage availability and quality would result. Less significant benefits would occur in other forest management areas.

Under Alternative C, approximately 50% of the terrestrial wildlife habitat in the Scratchgravel Hills would be withdrawn from mineral entry and development. This would fully protect wildlife habitat in this portion of the Scratchgravel Hills.

Beneficial impacts would be realized on important mule deer winter habitat in the Limestone Hills and Spokane Hills by closing these areas to motorcycle race events. Concentrated osprey nesting habitat in the Spokane Hills would be free from potential disturbance under this alternative.

The effects of special designation for the Ear Mountain area would be the same as under Alternative A. The effects of a Recreation Lands designation for the Sleeping Giant area would be similar to ACEC designation (see Alternative A discussion), except that wildlife would generally receive less emphasis when compared to recreation management objectives. It is unlikely that the effects of this designation would be significantly different than ACEC designation in the long-term.

Grizzly Bear. Under this alternative grizzly bear habitat on the RMF would be afforded total protection from potentially adverse land uses.

Certain land uses, such as oil and gas exploration and development and livestock grazing on the RMF, are considered to have high potential conflicts with grizzly bear habitat. This alternative would fully protect the areas from oil and gas exploration and development while still allowing livestock grazing and the needed range improvements. All occupied grizzly bear habitat would be zoned for no surface occupancy, and exploration and development could not occur on more than one key seasonal habitat area at the same time. It is felt that livestock grazing under well designed and implemented systems would significantly improve the present grizzly bear habitat conditions, and important spring, summer, and fall grizzly bear habitat would significantly benefit under this alternative. Short-term downward adjustments in livestock grazing would be substantially the same as the preferred alternative. Grazing system implementation would still be accomplished on I allotments. Grizzly bear habitat would improve from the current 40% unsatisfactory to 5% unsatisfactory, primarily due to additional fencing in key seasonal use areas (to rest an area or to defer livestock grazing).

Gray Wolf. Under this alternative, gray wolf recovery habitat on the RMF would be afforded total protection from potentially adverse land uses.

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Certain land uses, such as oil and gas exploration and development on the RMF, are considered to have high potential conflicts with gray wolf recovery habitat. This alternative would result in the Blind Horse, Chute Mountain, and Deep Creek/Battle Creek units being fully protected from potential oil and gas impacts.

Potential gray wolf recovery habitat, as reflected in big game seasonal habitat conditions, would moderately improve under this alternative. The most significant improvement would be in bighorn sheep winter/spring habitat on the Rocky Mountain Front, which would improve from 30% unsatisfactory to 6% unsatisfactory. Mule deer winter/spring habitat is the most widespread on the Rocky Mountain Front and this would improve from 10% unsatisfactory to 5% unsatisfactory (see Table 4-12). The improvement in mule deer habitat is essentially the same as would occur under Alternative A; however, bighorn sheep habitat would improve significantly more, primarily due to winter/spring ranges being excluded from livestock grazing.

Peregrine Falcon and Bald Eagle. Under this alternative bald eagle and peregrine falcon habitat would not be subject to any potentially adverse land uses.

Total protection of the Yellowstone River Island would benefit seasonally used bald eagle and peregrine falcon habitat by eliminating potential land use activities that could remove cottonwood trees on the island. Bald eagle and peregrine falcon habitat on the RMF would also benefit from wilderness designation.

Mule Deer. Mule deer winter/spring habitat, totaling 109,892 acres, would improve significantly from the current 25% unsatisfactory to approximately 7% unsatisfactory (see Table 4-12). Improvement would be accomplished through grazing system implementation, with primary emphasis on browse maintenance and improvement, and with a short-term 14.2% reduction in livestock AUMs. No big sagebrush would be treated under this alternative. Reseeding approximately 140 acres to bitterbrush and sagebrush would improve winter range conditions on two allotments. This seeding would also be done under Alternative A. A moderate 3.5% long-term increase in livestock AUMs would not adversely impact mule deer habitat. This represents a long-term allocation of 5,200 AUMs to wildlife habitat.

Mule deer spring ranges would similarly improve through short and long-term reductions in livestock AUMs, and grazing management plans that incorporate mule deer habitat objectives. The improvement would be reflected in an increased

abundance of early growing grasses and forbs that are critically important to mule deer during April and May.

Mule deer summer/fall habitat would improve from the current 10% unsatisfactory to 5% unsatisfactory (see Table 4-12). Yearlong habitat would improve from the current 21% unsatisfactory to 6% unsatisfactory (see Table 4-12), primarily due to the implementation of livestock grazing systems that emphasize browse maintenance and riparian habitat improvement, and a short-term 14.2% reduction in livestock AUMs. The construction of 75.9 miles of fence (13.7 miles more than Alternative B) would increase entanglement hazards, but proper fence design would mitigate this. Additional fencing would be necessary for riparian and moist-meadow habitat protection.

Bighorn Sheep. Under Alternative C, bighorn sheep winter/spring habitat conditions would significantly improve from the current 17% unsatisfactory to 3% unsatisfactory (see Table 4-12). Improved forage availability, vigor, and composition on crucial winter/spring ranges would result from reductions in livestock AUMs, implementation of grazing systems that emphasize bighorn sheep habitat requirements, and the exclusion of livestock grazing from some areas.

Bighorn sheep numbers would probably increase in at least one sub-population of the Sun River herd, because forage availability on winter range is one primary factor limiting bighorn sheep numbers.

Summer/fall habitat is largely satisfactory due to the fact that it is mostly unsuitable for livestock grazing. However, those areas suitable for livestock grazing would improve from the current 8% unsatisfactory to 4% unsatisfactory (see Table 4-12), due to AUM reductions, grazing system implementation, and exclusion of livestock grazing.

Elk. Elk winter/spring habitat would improve substantially to 5% unsatisfactory under this alternative. This would be accomplished through stocking reductions of 2,044 AUMs on fifteen allotments containing winter/spring habitat. These allotments would also have changes incorporated into their management plans to reflect management objectives for elk habitat. Total exclusion of livestock would be proposed on 5,312 acres.

The availability of key grass forage species would increase substantially, allowing elk numbers to increase significantly in many areas.

Elk summer/fall habitat in the three major unsatisfactory areas—Elkhorn, Bull-Dry Mountain, and Marysville—would improve greatly to 7% unsatis-

factory under this alternative. Most benefits would occur through stocking rate reductions, exclusion of livestock, especially from mesic habitats, and grazing systems developed with primary emphasis on improvement of elk summer/fall habitat.

Elk yearlong habitat would improve significantly from the current 25% unsatisfactory to 6% unsatisfactory (see Table 4-12).

Pronghorn Antelope. This alternative would improve antelope winter/spring habitat significantly over current conditions. Winter/spring habitat would improve over the long term from 22% unsatisfactory to 11% unsatisfactory (see Table 4-12). Improvement in winter/spring habitat quality would result from the implementation of grazing systems designed for improvement of antelope habitat and exclusion of livestock from certain areas.

Summer/fall and yearlong habitat conditions would improve from the current 23% and 21% unsatisfactory to 15% and 9% unsatisfactory respectively (see Table 4-12).

Improvement in these habitats would result from the implementation of livestock grazing systems, the exclusion of livestock, and seedings of dryland legumes on two allotments near Radersburg. No water developments are proposed since water is not believed to be a major limiting factor for antelope in the resource area.

Moose. Under this alternative, the impacts of reducing livestock grazing, excluding livestock grazing from certain areas, and designing grazing systems to specifically benefit moose habitat would improve moose habitat condition significantly from the current 50% unsatisfactory to 8% unsatisfactory (see Table 4-12). Improved browse availability, vigor, and composition would result in improved moose winter/spring habitat quality. Approximately eight miles of moose winter/spring habitat, and 4,500 acres of summer/fall habitat, would be excluded from livestock grazing in the Golconda-Muskrat Creek area. This would lead to a significant improvement in moose habitat.

Waterfowl. Under this alternative, the current 21% unsatisfactory habitat would improve to 0% unsatisfactory (see Table 4-12) due to extensive fencing proposals and the total exclusion of livestock from waterfowl habitat. This would involve approximately twelve miles of fence construction.

Conclusion

Aquatic habitat would improve from 62% satisfactory to 98% satisfactory under this alternative. Similarly, riparian vegetation would improve

from 72% satisfactory to 95% satisfactory (I allotments and M & C allotments combined). The short-term 14.2% reduction in livestock AUMs, implementing livestock grazing systems that incorporate riparian/aquatic habitat improvement objectives, excluding 35.9 miles of stream from livestock grazing, and standard operating procedures would all provide beneficial long-term impacts.

Implementing livestock grazing systems that incorporate habitat improvement objectives for T & E species; excluding livestock grazing from certain areas, especially in key seasonal grizzly bear habitat; attaching special stipulations to oil and gas leases; incorporating special management objectives into forest activity plans; instituting motorized vehicle restrictions; and implementing habitat improvement projects will all help improve, or maintain in satisfactory condition, threatened and endangered species habitat.

Grizzly bear habitat on the Rocky Mountain Front would improve substantially from 60% satisfactory to 95% satisfactory.

Seasonal big game habitat would improve by 16.5% overall. Beneficial impacts would result from a 14.2% short-term and 10.4% long-term reduction in livestock AUMs, the exclusion of livestock grazing from some seasonal use areas, the incorporation of big game improvement objectives into grazing plans, special stipulations on oil and gas leasing, standard operating procedures, and special forestry management considerations.

Impacts on Social and Economic Conditions

The impacts from forest management, land ownership adjustments, motorcycle use areas, motorized vehicle access, utility and transportation corridors, and special designations would be the same as for Alternative A.

This alternative places the most acreage in the no surface occupancy (39,020 acres) and lease denial (40,790 acres) categories. This would reduce the opportunity for those companies holding leases to explore for oil and gas. Appendix O describes the social and economic impacts of various levels of oil and gas development.

Under this alternative, thirty-four allotments would receive AUM reductions in their BLM grazing permits. The impacts associated with those reductions would be similar to those discussed under Alternative A, but the magnitude of these impacts would be different, and the number of individuals affected is greater. Specific impacts on

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income for the highest and lowest changes for each ranch size category are shown in Table 4-13.

Table 4-14 shows a summary of permittees affected by this alternative by size class, and shows the average dependency of those permittees in each class. This table combined with Table 4-13 shows the number of permittees affected by changes under this alternative and the maximum effect on ranch income after variable costs are deducted for each ranch size class.

The income figures shown in Table 4-13 do not take into account family labor costs, depreciation or interest on land and equipment. Therefore, actual usable income for these operations would be less than that shown. Ranch budgets used for the analysis are shown in Appendix P.

Under this alternative, all five areas being studied for wilderness would be recommended as suitable for wilderness designation. In the Black Sage area the primary affect would be on individual ranchers who use the area for livestock grazing. The use of vehicles to move and inspect cattle, or to maintain range improvements, could be limited. This would

require ranchers to schedule their vehicle use in the area more carefully or to use other more expensive and time consuming methods. Range improvements that would require maintenance include six miles of fence, a pipeline, three stock tanks and a 23,000 gallon water tank. Restrictions could also be placed upon construction of new range improvements in the area. This could reduce the opportunity to increase forage production or improve forage utilization in the area. There is also some woodland acreage in the Black Sage area that would not be available for limited harvest if the area is designated as wilderness.

The use of the Yellowstone River Island is presently limited to occasional stops by boaters on the Yellowstone River. Designation of the island as a wilderness could increase visitor use and possibly create problems with neighboring landowners. This type of problem could be mitigated by management of the use of the island.

The primary impacts in the Blind Horse Creek, Chute Mountain, and Deep Creek/Battle Creek areas would be related to the availability of areas

TABLE 4-13
CHANGES IN INCOME FROM REDUCTIONS IN STOCKING RATES: ALTERNATIVE C

| Ranch Size (cows) | Highest Reductions | | | Lowest Reductions | | | Present Income (dollars) |
|----------------------|--------------------------------------|----------------------|----------------------------------|--------------------------------------|----------------------|----------------------------------|--------------------------------|
| | Change in Stocking Rate (cows) | Income* (dollars) | % Change in Present Income | Change in Stocking Rate (cows) | Income* (dollars) | % Change in Present Income | |
| 0-100 | -41 | -2,416.19 | -16.8 | -0 | 3,553.00 | 0 | 3,553.00 |
| 101-250 | -28 | 13,365.42 | -25.9 | -1 | 17,817.15 | -1.2 | 18,041.14 |
| 251-500 | -49 | 30,847.76 | -22.2 | -7 | 38,402.30 | -3.2 | 39,661.39 |
| 501-1,000 | -123 | 83,689.58 | -20.1 | -3 | 104,273.18 | -0.5 | 104,787.77 |
| More than 1,000 | -16 | 171,573.01 | -1.6 | -16 | 171,573.01 | -1.6 | 174,313.01 |

*These figures are net income after variable costs, and do not reflect fixed costs, depreciation, and returns on land investment.

TABLE 4-14
IMPACTS ON PERMITTEES: ALTERNATIVE C

| Size Class | Number of Permittees Receiving Increases | Average Dependency (%) ¹ | Number of Permittees Receiving Decreases | Average Dependency (%) ¹ |
|------------|---|--|---|--|
| 1 | 0 | — | 5 | 29.8 |
| 2 | 0 | — | 13 | 27.6 |
| 3 | 0 | — | 11 | 19.4 |
| 4 | 0 | — | 9 | 13.5 |
| 5 | 0 | — | 1 | 8.4 |

¹Dependency is defined as the percentage of a rancher's total AUMs that is supplied by public land.

for exploration and development of oil and gas. Over the long term, these resources would be forgone if these areas are designated. The social and economic impacts of different levels of leasing are described in Appendix O.

A withdrawal from mineral entry of part of the Scratchgravel Hills would tend to mitigate further conflict between area homeowners and miners. It would also reduce the opportunity for further mining development in the area. The impacts from coal leasing would be the same as for Alternative B.

Conclusion

Alternative C would result in a short term income loss of as much as \$21,000 per year for some grazing permittees. Over the long term, the loss would not be as great, but some permittees would still experience a loss.

This alternative also proposes designation of five wilderness areas. This would restrict vehicle access and could increase some of the costs of maintaining existing projects. Others who currently use vehicles in the area would also be restricted from using vehicles. This would likely reduce hunting use in the Black Sage area.

ALTERNATIVE D: PRODUCTION

Impacts on Air Quality

The impacts on air quality under this alternative would be the same as for Alternative A.

Impacts on Soil and Water Resources

The impacts from land ownership adjustments, mineral exploration and development, motorcycle use areas, and coal leasing would be the same as for Alternative A.

Under this alternative there would be no areas zoned for no surface occupancy and 10,950 acres zoned for no leasing. This is less acreage in both categories than under Alternative B (No Action), and consequently there is a greater potential for adverse impacts to soil and water resources under this alternative. In areas not zoned for no surface occupancy or no leasing, the general impacts from oil and gas exploration would be the same as those described under Alternative A.

There would be about a 1,000 acre decrease in unsatisfactory watershed condition under this alternative from the implementation of grazing systems.

The consequences of timber harvesting would generally be the same as described in Alternative A. However, since more timber would be available for harvest under this alternative than under the current situation, the potential for impacts would be greater.

Erosion and a loss of vegetative cover would occur if off-road vehicles are used in areas of fragile soils and fragile vegetation zones.

The effects of not making any special designations would be the same as under Alternative B.

Impacts on Energy and Minerals

The impacts from land ownership adjustments, motorized vehicle access, and coal leasing would be the same as for Alternative A.

Approximately 107,300 acres (91%) would be available for surface occupancy. No areas would be zoned for no surface occupancy stipulations, and 10,950 acres would not be leased. This acreage is in the Sun River Game range and would not be leased under any alternative.

The requirements of the Endangered Species Act would still mandate that sensitive areas have restrictive seasonal or, in some cases, no surface occupancy stipulations.

Impacts on Recreation Resources

Impacts from grazing allotment and riparian habitat management, forest management, land ownership adjustments, and mineral exploration and development would be the same as under Alternative A. The impacts from motorcycle use areas, motorized vehicle access, and special designations would be the same as under Alternative B.

Oil and gas leasing and development activities would increase access, which would increase the opportunity for recreation in the area. However, the result of oil and gas activity may change the type of opportunity available. For example, instead of solitude and primitive types of opportunities, there may be a shift to more motorized or group types of activities. However, much of the area is not suited to more developed forms of recreation.

Impacts on Visual Resources

The impacts on visual resources would be the same as for Alternative A.

Impacts on Cultural Resources

The impacts on cultural resources would be the same as for Alternative A.

Impacts on Wilderness Resources

The impacts on wilderness resources would be the same as for Alternative B.

Impacts on Timber Resources

All 58,099 acres of suitable commercial forestland would be available for timber production. Timber production would only be limited by the physical limitations of the site. No lands would be set aside for wilderness, wildlife, or recreation purposes. A total of 29 million board feet/decade could be harvested on a sustained yield basis. This is an increase of 2.55 mmbf/decade over Alternative B. All 18,940 acres of woodland would be available for the limited harvest of forest products under this alternative.

Impacts on Range Resources

Under this alternative a short-term reduction of 1,236 AUMs is proposed in nine allotments, while thirty-four allotments would receive an increase of 3,689 AUMs. These changes will result in a net increase 2,453 AUMs, or 7.8%, of the current authorized use.

In the long term, there would be an additional 7,117 AUMs made available for livestock use, which is a 22.6% increase over the current authorized use. This projection of additional livestock AUMs is based upon expected increases in forage production, availability, and utilization. These increases would be dependent upon implementation of grazing systems, installation of range improvements, and implementation of land treatments. Table 4-15 summarizes the short and long-term changes proposed in current authorized use.

TABLE 4-15
CHANGES IN GRAZING PREFERENCE:
ALTERNATIVE D

| | Total AUMs | Change in Use | |
|------------------------|------------|---------------|------|
| | | AUMs | % |
| Current Authorized Use | 31,501 | — | — |
| Short-Term Adjustment | 33,954 | +2,453 | 7.8 |
| Long-Term Adjustment | 38,618 | +7,117 | 22.6 |

Seeding and interseeding of native and introduced plants is proposed for 3,140 acres under this alternative. For the most part, the sites proposed to receive this type of treatment have very low natural potential to improve from their present fair or poor condition because of unfavorable soil and climatic conditions. Controlled burning is proposed for 4,640 acres, significantly more than in any other alternative. The reason for burning these areas is to decrease the amount of sagebrush, juniper, Douglas fir, and other woody plants that presently compete with and reduce the production of herbaceous vegetation. Biological and chemical control of noxious or poisonous plants is proposed for 467 acres. Table 2-5 presents a complete summary of the kinds and quantities of improvements and treatments needed to place this alternative into effect.

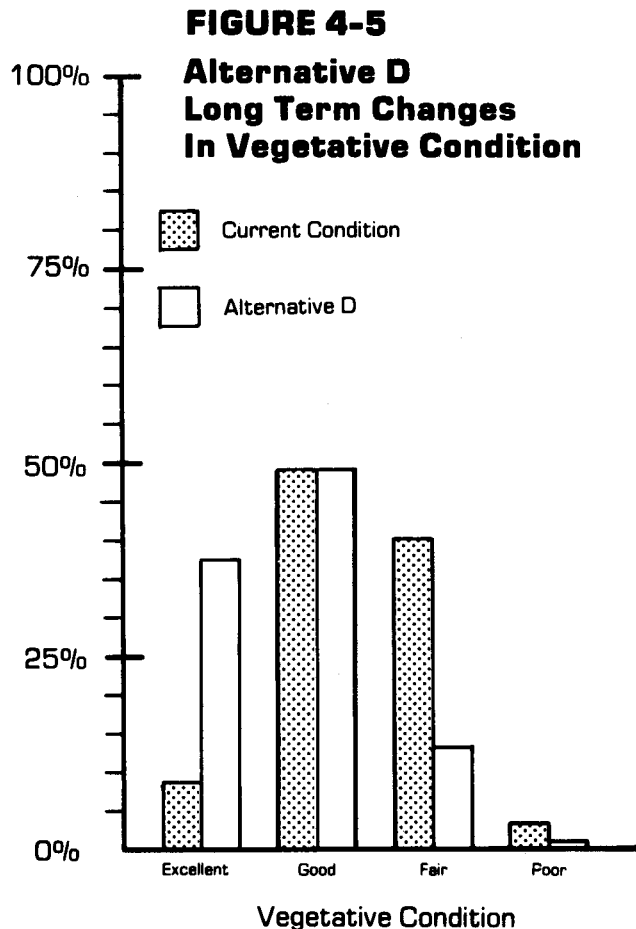
The predictable short-term change in vegetation that would occur under this alternative is an increased utilization of available forage by livestock. Figure 4-5 illustrates the expected changes over the long-term. These projections are based upon the potential for the vegetative community that presently occupies a site to improve in response to changes in grazing management. In projecting long-term vegetative condition, the assumption is made that vegetative condition for sites in M and C allotments would not change.

The 7,780 acres proposed for treatment (see Table 2-5) were not included in computing vegetative condition for Alternative D since they would become unclassified acres once the native vegetation was disturbed.

Control of noxious and poisonous plants, which is proposed for 467 acres, will have a locally beneficial impact on livestock grazing by reducing death and sickness in domestic animals. While some additional livestock forage may be produced as a result of timber harvesting, livestock use would be granted on a year to year basis and not have a long-term impact of the total number of AUMs allocated to livestock.

The major long-term consequence of this alternative on vegetation would be a significant increase in the production of good quality forage plants and the restoration of productivity on sites that currently have a limited potential to improve.

The specific short-term adjustment proposed for each I allotment is displayed in Appendix N. The impact of implementing these adjustments would vary from allotment to allotment, depending upon how the grazing use in the allotment fits into the yearlong ranch operation. For example, availability of additional summer pasture may be of little



importance if fall, winter, and spring pasture limits the number of livestock in an operator's herd.

Six of the nine allotments being reduced, and thirty-three of the thirty-four allotments being increased, would receive more than a 15% adjustment from current authorized use. Downward adjustments of more than 15% would normally be phased in over a five year period unless a shorter period was mutually agreed upon. Upward adjustments exceeding 15% can also be subjected to a five year phase in period. This would provide most operators affected by these adjustments adequate time to make the changes needed in their overall livestock operation.

Conclusion

For at least the past three years, 1,837 AUMs of nonuse each year have been authorized in seven of the nine allotments scheduled for reduction. In two of the allotments scheduled for an increase, 278 AUMs of temporary nonrenewable use have been authorized for at least the past three years. Using the past three years average actual livestock use as a baseline, this alternative would propose a

downward adjustment in two of the allotments and an increase in thirty-three allotments.

Appendix F describes the kinds of range improvements that are proposed. Careful placement of these improvements and proper design are effective tools in mitigating possible adverse impacts on vegetation and livestock.

The short-term increase in livestock grazing may result in a reduction in vigor for preferred forage plants. This should be temporary, and vigor will be restored when range improvements are constructed and grazing systems implemented.

The vegetative conditions and target livestock grazing levels proposed in this alternative are sustainable and thus production of both livestock forage and livestock will increase in the long-term.

There are 3,140 acres proposed for reseeding. Once the native vegetation on these acres is replaced by other plant species, it would be unlikely that a native plant community would again occupy the site.

This alternative projects a substantial increase in the amount of vegetation in excellent condition. There will be a 7.8% net increase in short-term livestock AUMs. Both structural and nonstructural range improvements and treatments are proposed at an estimated cost of \$442,020.

Impacts on Wildlife and Fisheries

The impacts from coal leasing would be the same as for Alternative A, and the impacts from motorcycle use areas, motorized vehicle access, utility and transportation corridors, and special designations would be the same as for Alternative B.

Aquatic Habitat

Standard stipulations would apply to all oil and gas activity, which would afford adequate protection to aquatic habitat. However, as with any surface occupancy, a minor potential would still exist for such things as water contamination and increased stream sediment, because of surface erosion. Surface occupancy, with standard stipulations, would be allowed in, and near, the ecologically unique Pine Butte and Antelope Butte swamps.

Short-term livestock increases would be proposed for the 1 allotments when monitoring and inventory data indicate forage is available. These short-term increases in livestock use would decrease the amount of satisfactory aquatic habitat. There would also be changes in seasons and in class of livestock. These changes, coupled with improved distribution, would result in an overall increase in satisfactory condition, even though

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some allotments would be experiencing an increase in livestock use.

The long-term forage allocations will put more pressure on the riparian vegetation and the stream banks. This increased pressure will result in eventual decreases in the quality of the aquatic habitat. Decreases can be expected on about 30% of the total stream habitat in the resource area. Much of the stream habitat in the resource area is unused by livestock even in high use allotments. These areas are typically rocky, steep and inaccessible to livestock. They will remain in satisfactory condition. The M and C allotments would not have any short or long-term adjustments. Their condition would be dependent upon the trend for the individual tracts of land.

The impacts from forest management would be similar to those discussed under Alternative A. The application of standard operating procedures would lessen adverse impacts (see Management Guidance Common to all Alternatives), and buffer zones adjacent to springs and streams would still be established. However, road construction and other soil disturbances would likely increase because of no specific multiple use withdrawals.

Riparian Habitat

Under this alternative, riparian habitat would improve slightly in the I allotments from the current 51% satisfactory to 54% satisfactory (see Figure 4-2). M and C allotment condition would remain static at the current 95% satisfactory (see Figure 4-2). Even though short-term stocking rate increases would amount to 1,531 AUMs, the implementation of grazing systems in areas where season-long grazing now occurs is expected to have some beneficial impact. Riparian habitat quality on the M and C allotments would remain static because no change is expected in the existing grazing systems.

Some short-term adverse impacts on riparian habitat would result from increased timber harvesting in the resource area. Road construction through riparian zones would be the primary source of disturbance. Application of standard operating procedures, including the development of major forest activity plans, would minimize the adverse impacts.

Setting no areas aside from the commercial timber base for the protection of riparian habitats would result in significant adverse impacts to riparian areas and the wildlife species that utilize them. The most significant impacts would occur in the high priority forest management areas. A diversity of wildlife species, including moose, deer, and elk, seasonally depend on riparian zones for winter, calving, and nursery habitat. Grizzly bear

habitat on the Rocky Mountain Front would similarly be affected.

Terrestrial Wildlife Habitat

The bighorn sheep, elk, mule deer, and mountain goat winter and spring ranges in the Ear Mountain, Antelope Butte, and Beaver Meadows areas would be adequately protected through seasonal stipulations on oil and gas exploration and development activities. However, the potential for habitat disturbance through road construction, development of ancillary facilities, and increased human access exist. All remaining winter/spring ranges would be minimally protected through seasonal stipulations on exploration. The impacts would vary depending on the extent and concentration of the activities.

The impacts of harvesting 2.9 million bf/yr would vary depending on the harvest method, season, duration of activity, and location of the cutting unit. The application of the Montana Cooperative Elk-Logging Study Guidelines (see Management Guidance Common to all Alternatives) and standard operating procedures would lessen adverse impacts. However, not setting aside areas from the commercial timber base for the protection of wildlife habitat would result in significant adverse impacts to terrestrial habitat, because these set aside areas would be for key seasonal wildlife areas where adverse impacts would occur from any timber harvesting.

Grizzly Bear. The identified key seasonal grizzly bear habitat areas would be minimally protected through seasonal exploration and development stipulations. Oil and gas development activities, including the construction of roads and ancillary facilities, could have significant impacts in these key habitat areas. Development occurring simultaneously in more than one key seasonal grizzly bear habitat area is possible under this alternative. Depending on the extent of this development, simultaneous activity could jeopardize the continued existence of the Rocky Mountain Front grizzly bear population (USDI, FWS 1980b).

Important spring, summer, and fall grizzly bear habitat would decline in condition under this alternative. Short and long-term increases in livestock AUMs on two of the most important allotments would adversely influence moist-site habitats. The implementation of livestock grazing plans (AMPs) would still be possible under this alternative. This would only partly mitigate those adverse impacts, because grizzly bear habitat would not receive priority management emphasis. Grizzly bear habitat would decline in condition from 40% unsatisfactory to 50% unsatisfactory.

Gray Wolf. Where seasonally important big game habitat overlaps key grizzly bear habitat, adequate protection would be given through the application of seasonal exploration and development stipulations on oil and gas activities. However, as with any surface occupancy, the potential for increased habitat disturbance through construction, development of ancillary facilities, and increased human access exists. Where seasonally important big game habitat does not overlap with key grizzly bear habitat, minimal protection would be given by seasonal exploration stipulations. These winter and spring ranges would receive impacts to a greater or lesser degree depending on the extent and concentration of the oil and gas development. The protection of seasonally important big game habitat is essential to the recovery of wolves in the Rocky Mountain Front.

Important seasonal big game habitat, especially bighorn sheep habitat, would decline in condition. This would adversely affect wolf recovery habitat. Short and long-term increases in livestock AUMs on two of the more significant allotments (in terms of big game seasonal habitat) would adversely influence habitat quality. Bighorn sheep habitat on the Rocky Mountain Front would be the most affected, changing from 30% unsatisfactory to 47% unsatisfactory.

Mule Deer. Mule deer winter/spring habitat would be significantly adversely affected under this alternative. Condition ratings would change from 25% unsatisfactory to 41% unsatisfactory (see Table 4-16). This is primarily due to 4,640 acres of sagebrush treatments and 3,140 acres of reseeding. The majority of these treatment acres are on seasonally important mule deer habitat. Sagebrush, bitterbrush, and other browse species are major winter components of mule deer diets (Dusek 1975, South 1957, and USDI, BLM 1981). Mule deer summer/fall habitat would decline in condition from the current 10% unsatisfactory to 18% unsatisfactory (see Table 4-16). This would primarily be due to the deterioration of moist-site habitats. Yearlong habitat would similarly decline from the existing 21% unsatisfactory to 39% unsatisfactory (see Table 4-16). This would also be a result of the deterioration of moist-sites and browse treatment proposals.

Bighorn Sheep. Bighorn sheep winter/spring habitat would significantly decline in condition from the current 17% unsatisfactory to 27% unsatisfactory (see Table 4-16). Short-term forage increases of 216 AUMs on three allotments would adversely impact bighorn sheep winter/spring range. Further AMP development with the primary emphasis on livestock forage production would similarly lead to deteriorated habitat condi-

tions. Significant winter/spring dietary overlap has been documented for bighorn sheep and domestic livestock (Kasworm 1981 and Schallenger 1966) on the Rocky Mountain Front.

Summer/fall habitat condition would not change significantly under this alternative, since the majority of these areas are unsuitable for cattle grazing and no changes in class of livestock are proposed.

Elk. Under this alternative elk winter/spring habitat would decrease from the current condition of 23% unsatisfactory to 30% unsatisfactory (see Table 4-16). Although range improvements would produce more forage, the projected increase of 2,126 AUMs, on allotments containing winter/spring habitat would largely be allocated to livestock. Grazing system implementation would still be accomplished, although livestock forage production would be the first priority. Long-term forage allocations would be significantly higher than Alternative B, thus reducing elk numbers on most of the winter/spring ranges. Summer/fall habitat would similarly decrease in condition to 31% unsatisfactory. Elk calving habitat would be adversely affected on ten allotments by the removal of 4,640 acres of big sagebrush. A portion of the increased livestock allocation would be provided through increased grass production on areas where big sagebrush would be treated. Therefore, the 7.8% overall AUM increase for livestock would not necessarily represent 7.8% less forage to elk (and to other wildlife), but probably about 5% to 6% less.

Pronghorn Antelope. Under this alternative, the quality of winter/spring habitat would be the most significantly affected; declining from 22% unsatisfactory to 42% unsatisfactory (see Table 4-16). The proposal to treat 4,640 acres of big sagebrush would adversely impact the limited amounts of big sagebrush available to antelope. The herbaceous response following big sagebrush treatment would partially offset the adverse impacts of loss of forage and cover. However, the impacts would still be significant as big sagebrush is considered in short supply on most antelope ranges in the resource area. Summer/fall habitat would similarly decrease in quality from the current 23% unsatisfactory to 36% unsatisfactory (see Table 4-16).

An increase in livestock grazing of 817 AUMs would adversely impact the herbaceous component of summer/fall habitat. Livestock grazing systems would further be designed to maximize livestock production, and not improvement of antelope habitat.

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TABLE 4-18
LONG-TERM WILDLIFE HABITAT CHANGES RESULTING FROM GRAZING ALLOTMENT AND RIPARIAN HABITAT
MANAGEMENT: ALTERNATIVE D¹

| Type of Habitat | Current Condition | | Alt. D | | Type of Habitat | Current Condition | | Alt. D | |
|-------------------------------------|-------------------|-----|--------|-----|----------------------------------|-------------------|----------|--------------|----------|
| | Acres | % | Acres | % | | Acres | % | Acres | % |
| Elk-wt/sp | | | | | Antelope-wt/sp | | | | |
| Satisfactory | 51,759 | 77 | 46,680 | 70 | Satisfactory | 10,452 | 78 | 7,844 | 58 |
| Unsatisfactory | 14,926 | 23 | 20,005 | 30 | Unsatisfactory | 3,072 | 22 | 5,680 | 42 |
| Elk-su/fa | | | | | Antelope-su/fa | | | | |
| Satisfactory | 19,896 | 77 | 17,815 | 69 | Satisfactory | 10,921 | 77 | 9,075 | 64 |
| Unsatisfactory | 5,922 | 23 | 8,003 | 31 | Unsatisfactory | 3,259 | 23 | 5,105 | 36 |
| Elk-yearlong | | | | | Antelope-yearlong | | | | |
| Satisfactory | 6,678 | 75 | 6,174 | 70 | Satisfactory | 15,618 | 79 | 12,096 | 61 |
| Unsatisfactory | 2,142 | 25 | 2,646 | 30 | Unsatisfactory | 4,212 | 21 | 7,734 | 39 |
| Mule deer-wt/sp | | | | | Waterfowl-sp/su/fa | | | | |
| Satisfactory | 82,147 | 75 | 64,837 | 59 | Satisfactory | 1,975 | 79 | 1,925 | 77 |
| Unsatisfactory | 27,763 | 25 | 45,073 | 41 | Unsatisfactory | 525 | 21 | 575 | 23 |
| Mule deer-su/fa | | | | | Grizzly-yearlong | | | | |
| Satisfactory | 9,135 | 90 | 8,323 | 82 | Satisfactory | 12,882 | 60 | 10,735 | 50 |
| Unsatisfactory | 1,015 | 10 | 1,827 | 18 | Unsatisfactory | 8,588 | 40 | 10,735 | 50 |
| Mule deer-yearlong | | | | | | | | | |
| Satisfactory | 38,009 | 78 | 29,603 | 61 | | | | | |
| Unsatisfactory | 10,521 | 22 | 18,927 | 39 | | | | | |
| Bighorn sheep-wt/sp | | | | | | Miles | % | Miles | % |
| Satisfactory | 5,095 | 83 | 4,465 | 73 | Fisheries- | | | | |
| Unsatisfactory | 1,035 | 17 | 1,665 | 27 | Satisfactory | 58.1 | 62 | 68.7 | 73 |
| Bighorn sheep-su/fa | | | | | Unsatisfactory | 36.1 | 38 | 25.5 | 27 |
| Satisfactory | 9,317 | 92 | 9,190 | 91 | Long-term riparian habitat | | | | |
| Unsatisfactory | 783 | 8 | 910 | 9 | cond. on I Allot. ³ | | | | |
| Bighorn sheep-yearlong ² | | | | | Satisfactory | 35.75 | 51 | 37.95 | 54 |
| Satisfactory | 12,160 | 100 | 12,160 | 100 | Unsatisfactory | 33.95 | 49 | 31.75 | 46 |
| Unsatisfactory | 0 | 0 | 0 | 0 | Long-term riparian habitat | | | | |
| Moose-wt/sp | | | | | cond. on M&C Allot. ³ | | | | |
| Satisfactory | 5,832 | 60 | 4,037 | 42 | Satisfactory | 67.45 | 93 | 67.45 | 93 |
| Unsatisfactory | 3,888 | 40 | 5,683 | 58 | Unsatisfactory | 4.75 | 7 | 4.75 | 7 |
| Moose-su/fa | | | | | | | | | |
| Satisfactory | 5,012 | 88 | 4,608 | 80 | | | | | |
| Unsatisfactory | 748 | 12 | 1,152 | 20 | | | | | |

¹All terrestrial wildlife species information is shown in acres and percentages.

²This yearlong habitat is in the Devils Kitchen and portions of the Sleeping Giant areas that are predominantly inaccessible to domestic livestock.

³Condition of riparian habitat in 20 years with the first priority I allotments fully implemented.

Yearlong habitat would be subject to the same increases in stocking levels, big sagebrush treatments, and grazing systems, and would decline in condition from 21% unsatisfactory to 39% unsatisfactory (see Table 4-16).

The best habitat for antelope is a subclimax community with a good mix of grass, forb, and browse species. Since the objective of this alternative is to move all vegetative conditions towards climax communities (excellent condition), the decline in antelope habitat condition is a result of the projected declines in seral plant species, composition and vigor of palatable forbs, and browse canopy.

Moose. This alternative would result in a significant reduction in the quality of moose habitat in the resource area. Moose winter/spring habitat would change in condition from 40% unsatisfactory to 58% unsatisfactory (see Table 4-16). Continued unsatisfactory riparian habitat would remain on those M and C allotments with moose habitat. Stocking rates on the I allotments containing moose habitat would increase by 917 AUMs and grazing systems specifically designed toward livestock production would be implemented.

Waterfowl. This alternative would have minor adverse impacts on waterfowl habitat on four allotments. Conditions would decline from 21% unsatisfactory to 23% unsatisfactory (see Table 4-16). Stocking levels would be reduced on these allotments, but grazing systems would not necessarily reflect waterfowl habitat objectives.

Conclusion

Mitigation measures in the form of management guidelines for oil and gas exploration and development have been developed for grizzly bear, elk, mountain goat, and mule deer through the Rocky Mountain Front Wildlife Monitoring/Evaluation Program.

In certain instances no mitigating measures can be applied to an action. For example, if, after considering all reasonable alternatives and mitigating measures, the FWS indicates that a proposed action would jeopardize the continued existence of a threatened or endangered species, then the proposed action cannot be implemented as proposed, regardless of additional mitigating measures. However, the BLM could institute a habitat compensation program in order to allow the action to proceed. An example of a habitat compensation program would be for the BLM to acquire alternate habitat in an area to compensate for habitat that would be lost under the proposed action.

No further mitigating measures are deemed necessary beyond those outlined under Guidance Common to all Alternatives and standard operating procedures.

There would be significant residual impacts on seasonal wildlife habitat by the 4,640 acres of proposed vegetation manipulation.

In the short-term wildlife forage and cover would decrease on vegetation manipulation projects. These adverse impacts would be somewhat lessened over the long term as vegetation reestablishes.

Depending on the extent of commercial or residential development, wildlife habitat removed from public administration through land ownership adjustments would be irreversibly and irretrievably lost.

Aquatic habitat would improve minimally from 62% satisfactory to 73% satisfactory. Riparian habitat would improve marginally from the current 72% satisfactory to 73.5% satisfactory (I allotments and M & C allotments combined). These minimal beneficial impacts would result principally from livestock grazing management implementation even though short and long-term increases in livestock AUMs would be proposed. It is assumed that some improvement would result from grazing management implementation.

Terrestrial wildlife habitat would decline in condition to varying degrees depending on the seasonal habitat in question (Table 4-16). Threatened or endangered species habitat would be maintained in satisfactory condition for some species and decline in condition for others. Grizzly bear habitat on the Rocky Mountain Front would be adversely affected by declining from 60% satisfactory to 50% satisfactory over the long term. The predominant adverse impacts to grizzly bear habitat would be through minimal protection of key seasonal habitat by oil and gas leasing stipulations and short and long-term livestock forage increases on two of the most important grazing allotments for grizzly bear habitat. Oil and gas exploration and development occurring simultaneously in more than one key seasonal habitat area is possible under this alternative.

Seasonal big game habitat would decline by 16.0% overall. Adverse impacts would result from 7.8% short-term and 22.6% long-term increases in livestock AUMs, vegetation manipulation proposals, no withdrawal of key seasonal wildlife habitat for forestry management proposals, and minimal stipulations on oil and gas leasing proposals

Impacts on Social and Economic Conditions

The impacts from wilderness study recommendations, land ownership adjustments, mineral exploration and development, motorized vehicle access,

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transportation and utility corridors, and coal leasing under this alternative would be the same as for Alternative A. The impacts from motorcycle use areas and special designations would be the same as for Alternative B.

This alternative provides the second largest number of acres available for exploration. Due to the requirements of FLPMA and the Endangered Species Act, this alternative actually provides the maximum acreage available for exploration. See Appendix O for social and economic impacts of various levels of oil and gas development.

Under this alternative thirty-four permits would receive more AUMs and nine would receive cuts. Calculations of returns over cash costs assume that the individual rancher can, and will, use all of the AUM increases. The location and type of forage made available may not fit with a particular operation and therefore, may not be used. Returns above cash costs for high and low increases and decreases for each ranch size class are shown in Tables 4-17 and 4-18.

Table 4-19 shows a summary of permittees affected by this alternative by size class, and shows the average dependency of those permittees in each size class. This table combined with tables 4-17 and 4-18 shows the number of permittees affected by changes under this alternative and the maximum effect of these changes on ranch income after variable costs are deducted.

The returns shown in these tables do not take into account family labor costs, depreciation or interest on land and equipment. Therefore, actual usable income for these operations would be less than that shown in Tables 4-17 and 4-18. Ranch budgets used for this analysis are shown in Appendix P.

Conclusion

Alternative D would mean reductions in income for some grazing permittees of up to \$6,800, while others could increase income by up to \$9,000. Permit values would change according to increases or reductions in authorized AUMs. Timber harvest of 2.9 mmbf/yr would be available under this alternative, which would create approximately 23 jobs. This would be an increase of 22 jobs over the current situation.

TABLE 4-17
CHANGES IN INCOME FROM REDUCTIONS IN STOCKING RATES: ALTERNATIVE D

| Ranch Size (cows) | Highest Reductions | | | Lowest Reductions | | | Present Income (dollars) |
|----------------------|--------------------------------------|----------------------|----------------------------------|--------------------------------------|----------------------|----------------------------------|--------------------------------|
| | Change in Stocking Rate (cows) | Income* (dollars) | % Change in Present Income | Change in Stocking Rate (cows) | Income* (dollars) | % Change in Present Income | |
| 0-100 | -21 | 495.61 | -8.6 | -21 | 495.61 | -8.6 | 3,553.00 |
| 101-250 | -23 | 14,200.37 | -21.3 | -1 | 17,874.15 | -0.9 | 18,041.14 |
| 251-500 | -38 | 32,826.33 | -17.2 | -21 | 35,884.12 | -9.5 | 39,661.39 |
| 501-1,000 | -39 | 98,098.10 | -6.4 | -17 | 101,871.76 | -2.8 | 104,787.77 |
| More than 1,000 | No changes in ranches of this size | | | | | | |

*These figures are net income after variable costs, and do not reflect fixed costs, depreciation, and returns on land investment.

TABLE 4-18
CHANGES IN INCOME FROM INCREASES IN STOCKING RATES: ALTERNATIVE D

| Ranch Size (cows) | Highest Reductions | | | Lowest Reductions | | | Present Income (dollars) |
|----------------------|--------------------------------------|----------------------|----------------------------------|--------------------------------------|----------------------|----------------------------------|--------------------------------|
| | Change in Stocking Rate (cows) | Income* (dollars) | % Change in Present Income | Change in Stocking Rate (cows) | Income* (dollars) | % Change in Present Income | |
| 0-100 | +55 | 9,061.25 | +15.5 | =1 | 3,653.15 | +2.8 | 3,553.00 |
| 101-250 | +17 | 20,707.93 | +14.8 | =5 | 18,825.49 | +4.3 | 18,041.14 |
| 251-500 | +64 | 49,059.15 | +23.7 | =1 | 38,808.23 | +0.37 | 39,661.39 |
| 500-1,000 | +17 | 107,334.03 | +2.4 | =9 | 106,135.78 | +1.3 | 104,787.77 |
| More than 1,000 | +29 | 178,648.51 | +2.5 | =29 | 178,648.51 | +2.5 | 174,313.01 |

*These figures are net income after variable costs, and do not reflect fixed costs, depreciation, and returns on land investment.

TABLE 4-19
IMPACTS ON PERMITTEES: ALTERNATIVE D

| Size Class | Number of Permittees Receiving Increases | Average Dependency (%) ¹ | Number of Permittees Receiving Decreases | Average Dependency (%) ¹ |
|------------|---|--|---|--|
| 1 | 10 | 31.1 | 1 | 70.0 |
| 2 | 9 | 29.6 | 4 | 29.7 |
| 3 | 8 | 27.9 | 3 | 27.2 |
| 4 | 2 | 10.5 | 5 | 18.2 |
| 5 | 1 | 8.4 | 0 | — |

¹Dependency is defined as the percentage of a rancher's total AUMs that is supplied by public land.