Chapter Four

Chapter 4 - Environmental Consequences

4.1 Introduction

Chapter 4 analyzes the environmental impacts of implementing each Alternative described in Chapter 2. The affected environment described in Chapter 3 comprises the baseline used for projecting impacts. Management that could affect resources or resource uses has been analyzed, and the conclusions drawn from that analysis are described for the resource consequence section.

Resource management plans (RMPs) are designed to provide broad guidance and are not intended to be site or project specific. Current planning guidance allows implementation-level decisions to be made in a RMP when suitable. The impacts discussed in this chapter are general, described at a landscape or regional level. RMPs are implemented through site-specific projects and activity plans; these steps often require a separate site-specific National Environmental Policy Act (NEPA) analysis.

Many management actions are common to all Alternatives or to several Alternatives. Similarly, the impacts of implementing a given set of management actions might be common to a range of Alternatives or even to several seemingly disparate resources and uses. When a proposed activity is not addressed in a specific section, no impact is expected.

4.2 Analytical Assumptions

The following general assumptions and guidelines were used in the analysis of environmental consequences. Other assumptions specific to a particular resource are presented under that resource.

- Funding and personnel would be sufficient to implement any of the Alternatives as described for Chapter 2.
- The laws, regulations, and policies that direct Bureau of Land Management's (BLM) work would be applied consistently and as suitable across all Alternatives.
- All Alternatives would maintain vegetation resources and meet the need for water, nutrients, and energy cycling.
- The approved RMP would remain in effect for 15 to 20 years. The first year that the RMP would be in effect would be 2005. For items that were analyzed over time, the analysis was carried out to 2025.
- County populations for 2005 and 2025 would be as reported in the projections used in this RMP. Population projections for Maricopa and Yavapai Counties for 2005 were calculated by extrapolation from the year 2000 Census and the official Arizona Department of Economic Security annual population estimate for 2003. For the year 2025, this RMP uses the Maricopa Association of Governments (MAGs) interim projections by Municipal Planning Area (MPA) in Maricopa County. For the year 2025, a projection was developed for this RMP for Yavapai County from the known deviation between the 1997 population projection series for future years, the year 2000 Census (an actual county population that was 110 percent of the projected population), and the Arizona Department of Economic Security (DES) population estimate for 2003 for Yavapai County and its

incorporated places (an estimated county population that was 112 percent of the projected population).

- Short-term impacts are those expected to occur during and within 1 to 5 years of implementing the activity. Long-term impacts are those that would occur after the first 5 years of implementation.
- Recreational use in the planning areas would continue to increase. A visitor use study prepared by Arizona State University West (Andereck and others 2002) lists the general themes of recreation. The study was based on meetings with focus groups for various types of recreation and on surveys of recreation users in the planning areas.
- A total of 70 percent of visitors to BLM's lands in the planning areas reside in Maricopa and Yavapai Counties. The analysis assumed that the 70 percent share would remain constant throughout the life of the plan.
- Appendix C lists the laws and regulations with which all activities must comply and that might limit the range of management actions.

4.3 Types of Effects to be Addressed

This chapter describes the direct, indirect, and cumulative impacts of implementing *Alternative A*--the No-Action Alternative--and each of the four other Alternatives.

The impacts of the planning decisions on the visitor's experience would depend on the expectations and values of the individual visitor. A particular action could benefit some users and adversely affect others. The degree of impact would also vary relative to user sensitivity. Sensitivity would vary among user types and might also differ between new users and traditional users of a particular resource.

The impact analysis presents effects that might enhance or improve a resource as well as those that might degrade a resource. Instead of analyzing every minor interaction and cause-effect relationship, the impact analyses are confined to actions that have direct, immediate, and significant effects on the planning areas. Cumulative impacts, discussed at the end of the chapter, are effects that the Alternatives could have in relation to other past, current, and reasonably foreseeable future actions in and adjacent to the planning areas.

4.4 Incomplete or Unavailable Information

Federal regulations (43 CFR 1502.22) mandate that agencies evaluating reasonably foreseeable significant adverse effects on the human environment, in an Environmental Impact Statement (EIS), must discuss incomplete or unavailable information if that information is essential to a reasoned choice among Alternatives. This EIS is based on the best available data for each resource.

4.5 Critical Elements that will not be Addressed

There would be no known adverse impacts on certain critical elements of the human environment. These elements include prime or unique farmlands, floodplains, and hazardous or solid waste. This plan has not addressed these critical elements because they are not present in the planning areas or would not be affected by the management activities under the Alternatives. These critical elements would be considered, as suitable, in site-specific project design and implementation processes. Each of these excluded elements is discussed below.

Prime and Unique Farmlands: There are no prime or unique farmlands or farmlands of

statewide or local importance on public lands in the planning areas. None of the actions in the Alternatives analyzed in detail would disturb farmlands. Therefore, impacts on prime and unique farmlands are not analyzed further.

Floodplains: Although floodplains exist in the planning areas, no projects or activities resulting in permanent fills or diversions in, or placement of permanent facilities, on floodplains of major rivers are projected to occur under any of the proposed Alternatives. Therefore, impacts on floodplains are not analyzed further.

Hazardous and Solid Waste: No hazardous, toxic, or unapproved solid waste sites are known to occur on public lands in the planning areas. None of the actions, activities, and uses projected to occur with implementing the plan Alternatives would require the handling, storage, or release of significant amounts of these wastes. Therefore, impacts on or from hazardous and solid wastes are not analyzed in detail.

Indian Trust Assets: Indian trust assets are lands, natural resources, money, or other tangible assets held by the Federal Government in trust or restricted against alienation for Indian tribes and individual Indians. BLM has determined that the actions described for this land use plan would not affect Indian trust assets.

4.6 Impacts on Special Area Designations

This analysis covers the suitable Wild and Scenic River (WSR) segments of the Agua Fria River in Agua Fria National Monument, five existing wilderness areas, the Harquahala Mountain Summit Road Back Country Byway, proposed back country byways, and existing and proposed Areas of Critical Environmental Concern (ACEC).

The five existing wilderness areas were studied and found to have sufficient values of naturalness, solitude, and primitive and unconfined recreation opportunities to be designated by Congress. The values are somewhat diminished at the edge of the areas because of complex boundaries where different land uses occasionally affect core wilderness values.

A 1996 Colorado study found that scenic byway designation led to an increase in traffic on 8 of 21 new byways. This analysis assumes that proposed byways would increase traffic on the proposed routes because the routes accentuate cultural and scenic resources in the national monument and near the Wickenburg area.

4.6.1 From Special Area Designations

***Alternative A* (No Action)**

Alternative A would create no new special area designations. No impacts are expected to proposed suitable WSR segments, ACECs, the five wilderness areas, or the Harquahala Mountain Summit RoadBack Country Byway. Perry Mesa and Larry Canyon ACECs in Agua Fria National Monument would be maintained. No impacts are expected because the ACEC resources of relevance and importance are protected by the monument proclamation (Appendix A).

Alternative B

Designating Bloody Basin Road as a back country byway could affect the segments of the Agua Fria River suitable for WSR designation by increasing traffic and visitor access near the river crossing. More traffic and visitor use could diminish the scenic and habitat values and alter the recreation experience in the corridor. Since the road would be maintained to BLM type three standard, which would require high-clearance vehicles to traverse it, the increase in visitation is expected to be small. Byway visitors would have their recreational experience enhanced by

interpretation of Agua Fria National Monument's resources along the route.

Intensified traffic and recreation could affect the residents of the Horseshoe Ranch because of increased visitation, trespass, dust, and road maintenance needs. In turn, more visitors and traffic could impede pronghorn movement and migration.

Establishing the Constellation Mine Road Back Country Byway would increase the number of visitors along the road as well as to Hassayampa River Canyon Wilderness. Vehicular traffic would intensify along the byway, adversely affecting residents and ranchers residing in the area. Increased traffic, dust, road maintenance needs, and visitor levels would be expected. The increase in visitors could degrade the Hassayampa River Canyon wilderness experience for some visitors by reducing solitude opportunities. Conversely, byway visitors would have their recreation experience enhanced by interpretative signs placed along the byway describing resource and cultural values, including the area's ranching and mining history.

No impacts to the Harquahala Mountain Summit Road Back Country Byway are expected.

Alternative C

Impacts from designating back country byways would be similar to those described for *Alternative B.*

Finding tributary segments as eligible for designation as part of the Agua Fria WSR proposal would not affect the now protected and suitable WSR corridor in Agua Fria National Monument. Interim management protection prescriptions would be extended to other river tributary segments. This action would prevent impairment of any outstandingly remarkable values on another 6,600 acres of WSR corridor. The total area in existing and proposed corridors would be 13,100 acres or more than double the size of the existing proposed WSR corridor.

Designating four ACECs for protecting Gila chub habitat would not affect suitable or proposed WSR segments. Management actions proposed for the ACECs could be accomplished without affecting proposed WSR segments.

The Harquahala Mountain Outstanding Natural Area (ONA) ACEC maintains undeveloped lands, offers dispersed and resource-dependent recreational experiences, enhances natural quiet and dark sky conditions, and safeguards wildlife habitats and connectivety. Reduced dust from limited vehicle travel designations could maintain air quality, improving vistas from adjoining wildernesses and the Harquahala Mountain Summit Back Country Byway.

Alternative D

Designating the Agua Fria Riparian Corridor ACEC would not affect segments of the Agua Fria River suitable for WSR status. Under current WSR interim management, vehicle routes and developments might be restricted to protect outstandingly remarkable values, including riparian habitat and wildlife. Acquiring land along Indian Creek and removing the Perry Mesa and Larry Canyon ACECs would not affect the proposed ACEC or the Purpose and Significance of Agua Fria National Monument.

Impacts on designated wilderness from establishing Baldy Mountain ONA ACEC would be similar to those described for Harquahala Mountain ACEC in *Alternative C*.

***Alternative E* (Preferred Alternative)**

Impacts from designating the Bloody Basin Road and Constellation Mine Road/Buckhorn Mine Road Back Country Byways would be similar to those described for *Alternative B*. No impacts to the Harquahala Mountain Summit Road Back Country Byway are expected.

Acquiring land along Indian Creek and removing the Perry Mesa and Larry Canyon ACECs would have no resource impacts on

segments suitable for wild and scenic river status.

Impacts on designated wilderness from establishing the Harquahala Mountain ONA ACEC would be similar to those described for *Alternative C*.

4.6.2 From Lands and Realty Management

***Alternatives A* (No Action), *B, C, D* and *E* (Preferred Alternative)**

In Agua Fria National Monument disposing of land is not an option, and acquiring private lands (inholdings) would be consistent with management effectiveness and the national monument's Purpose and Significance. Disposal of lands would not affect any existing wilderness area, ACEC, or back country byway.

Acquiring lands within wilderness areas would benefit wilderness management by consolidating management of all lands within their boundaries. This outcome would prevent future development of non-Federal lands and retain wilderness values.

The Agua Fria WSR Corridor was found suitable for designation with the existing utility corridor and utilities in place. New utilities proposed for the corridor would be subject to approval for protecting the resources of the Agua Fria National Monument and the interim management guidelines of the WSR corridor. Facilities approved for construction under these criteria would not affect the existing WSR corridor.

Acquiring lands in the eligible segments of the WSR corridor in the national monument could benefit the segments by potentially adding more lands to the interim nonimpairment status. Such acquisitions would prevent the following:

- development on private lands, such as resumed mining on the Richinbar site,
- building new structures and range improvements, and
- installing communication towers and technological supports.

Such activities could increase ground disturbance and noise and add new structures visible from the WSR corridor. These developments could also diminish scenic values, including night skies, and disturb riparian habitat and wildlife populations on public land.

Allowing continued development of small utility distribution systems could degrade existing wilderness if development was proposed for in-holdings or on property near wilderness boundaries. Developments could affect wilderness character by adding noticeable human-made elements to the landscape. Increased presence of people and activity could lead to loss of solitude in some wilderness areas and lessen the recreation experience.

Retaining an existing multi-use utility corridor extending from Yarnell along the southwest portion of Hassayampa River Canyon Wilderness could degrade the wilderness. Projects added to the corridor could alter the natural and visual character of the area and diminish the wilderness experience for some visitors. Retaining other utility corridors should not affect other wilderness areas because the wilderness values were found to exist with the corridors in place and the potential for utility development was known.

4.6.3 From Management of Soil, Air, and Water Resources

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

Impacts to the WSR in Agua Fria National Monument should be prevented by (1) general guidance to maintain or improve resource conditions and (2) management to protect national monument resources. Obtaining legal

entitlement of water resources could benefit the WSR segments of the Agua Fria River by securing water availability to maintain the remarkable values that led to designation. Some of these values are described in the national monument's Purpose and Significance statements.

Requirements to maintain compliance with local and regional dust standards could improve air quality in some ACECs and wilderness areas, and enhance vistas from wilderness and back country byways.

No impacts are expected from soil and air resource management as described for the Lower Gila North Management Framework Plan (MFP) (BLM 1983). However, ensuring the legal availability of water and maintaining adequate flows of springs in the Harquahala Mountains would protect the wilderness area by protecting special spring and riparian features, sustaining diverse wildlife habitat, and maintaining habitat quality near springs.

Inventorying and filing for water rights in the Harquahala Mountains, Big Horn Mountains, Hummingbird Springs, Hassayampa River Canyon, and Hells Canyon Wilderness Areas would protect the areas by preserving the wilderness values of water sources.

4.6.4 From Biological Resource Management

***Alternative A* (No Action)**

Managing existing biological resources could affect the Agua Fria WSR Corridor. Opportunities to enhance wildlife habitat, species diversity, and riparian health exist in the national monument. Prescribed burning, tree planting along the river and its tributaries, and other actions to restore natural ecological conditions would enhance the values that make the river segments eligible for Wild or Scenic designation.

Transplanting populations of Gila chub would benefit the Larry Canyon and Perry Mesa ACECs by ensuring persistence of the species.

Alternative B

Impacts under *Alternative B* would be the same as described for *Alternative A* for Agua Fria National Monument except that Larry Canyon ACEC would be eliminated.

The Harquahala Mountains Wildlife Habitat Area (WHA) could affect Harquahala Mountains Wilderness by strengthening wildlife populations and maintaining more natural conditions next to the wilderness. New wildlife waters installed in wilderness areas could decrease naturalness by introducing more human developments in the wilderness. The wildlife waters would not be noticeable because they would be installed for consistency with Visual Resource Management (VRM) Class I objectives.

Alternative C

Impacts under *Alternative C* would be the same as described for *Alternative B* for Agua Fria National Monument. Managing pronghorn movement corridors could enhance the proposed eligible segments of the WSR in the Agua Fria River. Other controls on vehicle routes and recreation site development where wildlife corridors cross the river would help retain the outstandingly remarkable values that led to the areas' suitability.

The Harquahala/Belmont/Big Horn wildlife corridor and the Belmont/Big Horn WHA area would benefit Hummingbird Springs, Big Horn Mountains, and Harquahala Mountains Wilderness Areas by retaining natural open space and wildlife populations next to the wilderness and allowing wildlife movement between the wilderness areas**.** Protected wildlife movement areas would help sustain natural populations in the wilderness areas by providing extended habitat and maintaining the genetic diversity to assure long-term viability as individual animals move from one area to

another. Healthy wildlife populations in and around the wilderness areas would increase opportunities for wildlife viewing and hunting and retain the natural character of open space. The impact of new wildlife waters installed in wilderness would be the same as for *Alternative B*.

Alternative D

Impacts from wildlife management in Agua Fria National Monument would be similar to those described for *Alternative C*.

In the Bradshaw-Harquahala Planning Area biological resources are mainly managed through ACEC designations in locations that could affect wilderness areas. These impacts are discussed in section 4.6.1.

***Alternative E* (Preferred Alternative)**

The Harquahala Mountains ONA ACEC and the movement corridors would protect wildlife habitat and help maintain natural conditions, open space, and wildlife habitat/populations on public lands. Protecting and enhancing wildlife populations contributes to the naturalness of the area and to supplemental values that enhance visitor experiences, such as increased opportunities for wildlife viewing or hunting.

Impacts of new wildlife waters installed in wilderness would be the same as for *Alternative B*.

4.6.5 From Cultural Resource Management

***Alternative A* (No Action)**

There are no impacts expected.

Alternative B

Under *Alternative B* the historic Teskey homestead near the Agua Fria River would be allocated to public use and developed for public education and visitation. Visitors might disturb wildlife or leave trash in the area. Conversely, the presence of site visitors could help to deter illegal trash dumping. Developing an interpretive site is consistent with the recommended scenic status of this river segment since the Teskey site is not visible from the river. According to BLM's Manual 8351, recreational facilities are compatible with areas that are suitable for WSR status if such facilities are unobtrusive and do not adversely affect the natural character of a WSR area.

The Badger Springs petroglyph site, next to the proposed wild segment of the Agua Fria River, would also be interpreted for public visitation. The high level of visitation in this area would enhance the effectiveness of educational exhibits. Increased awareness of the site could make it more vulnerable to vandalism, which is why BLM has completed a detailed documentation of the site. On-site facilities would be limited to a small number of unobtrusive interpretive signs. More substantial recreational facilities would be located away from the river. The increase in visitors to the site and impacts are expected to be insignificant because Badger Springs Wash is already a popular area that serves as the most accessible and easy route for hiking in the river canyon.

Conducting Class III surveys along 12 miles of the Agua Fria River would provide useful information necessary to identify and protect cultural resources that comprise one of the outstanding values of WSR suitability.

In conducting surveys and scientific research in cultural priority areas in the Harquahala Mountains and Hassayampa River Canyon Wilderness Areas, these crews could temporarily diminish wilderness values, such as solitude. Most of these activities are expected to take place outside of wilderness areas to assess zones where cultural resources are more accessible and at greater risk of damage.

Sites developed for public use could affect the Harquahala Mountains and Hassayampa River Canyon Wilderness Areas through increased

visitation and activity, leading to a diminished sense of solitude for some visitors.

Alternative C

Impacts would be similar to those described for *Alternative B;* except that the area surrounding the Badger Springs petroglyph site would be developed with fewer facilities, in accordance with the Moderate public use level.

Alternative D

Potential impacts would be limited to Harquahala Mountains Wilderness and would be the same as described for *Alternative B*. The Wickenburg/Vulture Special Cultural Resource Management Area (SCRMA) would not be developed for public use under *Alternative D*.

***Alternative E* (Preferred Alternative)**

Potential impacts would be limited to Harquahala Mountains Wilderness Area and would be the same as described for *Alternative B*.

4.6.6 From Paleontological Resource Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

There are no impacts expected.

4.6.7 From Recreation Management

***Alternative A* (No Action)**

Current recreation uses would continue. Greater levels of visitation and motorized recreation use could lessen the values of eligible WSR segments of the Agua Fria River through increased noise, litter, and vehicular travel at several crossings. Existing vehicle routes in the national monument would remain open except for those in the WSR corridor. Increasing levels of recreation use and motorized activity on the boundaries of the five designated wilderness areas could lessen, to varying degrees, the quality of wilderness-based recreation and solitude opportunities in the interior and along wilderness boundaries. Existing ACECs would be maintained, and no impacts from recreation activities are expected.

Alternative B

The Back Country RMZ in Agua Fria National Monument would help preserve the values of the wild segment and the southern scenic segment of the Agua Fria River. A recreation setting of mainly semi-primitive non-motorized, in conjunction with VRM Class II objectives, would maintain the natural character and visual quality making the areas eligible for designation. Only dispersed camping is permitted in the Back Country RMZ, and this activity would not degrade the WSR segments.

The Front Country RMZ in the monument could affect the northern scenic segment of the Agua Fria River. Roaded natural and semi-primitive motorized recreation settings could lead to more vehicular travel in areas near the scenic corridor and diminish the recreation experience for some users in the corridor. Developing campgrounds would lead to concentrations of visitors. If the river is easily accessible from the sites, the increase in recreation use could change the character of the corridor in certain areas by adding to noise levels and litter. Dispersed camping would continue but is not expected to significantly affect the area. Restricting target shooting near high-use areas would affect the WSR segments by enhancing the recreation experience for other users. Visitors could still target shoot in the remaining areas within the corridor, which might degrade WSR values by damaging cultural resources such as petroglyphs.

Hieroglyphic Mountains Special Recreation Management Area (SRMA) could concentrate off-highway vehicle (OHV) use, increase traffic,

and increase noise at the southwest edge of the wilderness. This would diminish the sense of solitude and natural quiet for visitors in the wilderness. Greater fugitive dust could potentially enter Hells Canyon Wilderness, obscuring vistas.

No Special Recreation Permit (SRP)-related impacts are expected on wilderness areas, ACECs, or back country byways.

Alternative C

Impacts to Agua Fria National Monument would be similar to those described for *Alternative B*.

Impacts on Hells Canyon Wilderness from the Hieroglyphic Mountains SRMA would be similar to those described for *Alternative B*.

No SRP-related impacts to wilderness areas, ACECs, or back country byways are expected.

Alternative D

Impacts to Agua Fria National Monument would be similar to those described for *Alternative B*.

Managing the Hieroglyphic Mountains SRMA to phase out motorized use over a 10 to 20 year period could enhance management within the Hells Canyon wilderness. Removing the sights and sounds of OHV activities over time could reduce the degradation of wilderness values of solitude and naturalness and improve the primitive recreation experiences of visitors to wilderness users. Impacts to the Hells Canyon wilderness from motorized activities would be similar to those described under *Alternative B* until motorized use is phased out.

Managing the allocation to maintain or enhance wilderness characteristics would be compatible with managing the proposed Belmont-Big Horn Mountain ACEC. Maintaining natural conditions and providing opportunities for primitive recreation would not influence the resources within the proposed ACEC. The ACEC would contain 23,088 acres of the allocation to maintain or enhance wilderness characteristics.

No SRP-related impacts to wilderness areas, ACECs, or back country byways are expected.

***Alternative E* (Preferred Alternative)**

Impacts to Agua Fria National Monument would be similar to those described for *Alternative B*.

The Hieroglyphic Mountains SRMA would also be similar to *Alternative B*.

No SRP-related impacts on wilderness areas, ACECs, or back country byways are expected.

4.6.8 From Visual Resource Management

***Alternative A* (No Action)**

In Agua Fria National Monument, no impacts are expected to WSR suitable segments.

Within the Bradshaw-Harquahala Planning Area, proposed projects near wilderness areas could lessen the quality of the recreation setting and viewshed by allowing human intrusions into visual landscapes. Wilderness would remain VRM Class I areas and experience no visual change in their boundaries.

Alternative B

In the monument, managing the Front Country RMZ to VRM Class III objectives could degrade the WSR segments by allowing projects to more visually intrude into the landscape next to the river segments and by diminishing the scenic values that led to the determination of eligibility.

Alternative B is not expected to affect the visual resources of wilderness areas, existing or proposed back country byways, or the Tule Creek ACEC.

Alternative C

Impacts in Agua Fria National Monument would be similar to those under *Alternative B* except that they would mainly be limited to the northern WSR segment because the Back Country RMZ would be expanded and managed to VRM Class II objectives. Managing the back country byway to VRM Class II would prevent substantial visual intrusions in the byway's viewshed.

Alternative D

Impacts in Agua Fria National Monument would be similar to those under *Alternative C*.

Managing Harquahala Mountain ONA ACEC to VRM Class I objectives would benefit Harquahala Mountains Wilderness by raising the VRM class of 106,990 acres surrounding the area to the same class as the wilderness area, thus maintaining a large natural appearing landscape from within the wilderness area. Managing the ACECs to Class I objectives would benefit the Sheep Mountain Research Natural Area (RNA) and Black Butte ONA by minimizing visual intrusions into the natural setting of both areas. No future change or impairment to the viewshed in these areas would be expected.

***Alternative E* (Preferred Alternative)**

Impacts to Agua Fria National Monument would be similar to those under *Alternative C* on the proposed WSR segments.

Impacts to wilderness areas, which would remain VRM Class I in the Bradshaw-Harquahala Planning Area, would be the same as for *Alternative A*. No visual impacts to wilderness areas, existing or proposed back country byways, or to Tule Creek ACEC are expected.

Managing Harquahala Mountain ONA to VRM Class I objectives would benefit the adjacent Harquahala Mountains, Big Horn Mountains, and Hummingbird Springs Wilderness Areas by minimizing visual intrusions into the landscape. Impacts of managing the Black Butte ONA to Class I objectives would be similar.

4.6.9 From Rangeland Management

***Alternative A* (No Action)**

Applying the *Arizona Standards for Rangeland Health* (see Section 2.7.1.1) and *Guidelines for Grazing Administration* (see Section 2.7.1.9) would reduce impacts and improve characteristics for which special area designations, like wilderness, were designated. Land health standards would improve upland soils and vegetation to minimize erosion and other ground disturbance produced by inadequate vegetation cover. Additionally, the standards would improve riparian areas and stream functions, which would enhance the habitat and help sustain the landscape's natural character.

Reaches of the Agua Fria River were determined to have WSR values despite grazing in the corridor. Continued grazing should not degrade values, and applying Land Health Standards should maintain or improve habitat characteristics.

This Alternative is not expected to affect wilderness areas, ACECs, or back country byways.

Alternative B

Impacts of applying the Land Health Standards and Rangeland Management guidelines would be the same as for *Alternative A*.

In the uplands of special area designations, *Alternative B* would have impacts as described in the impacts of applying Land Health Standards above. Restricting grazing of riparian areas to winter would have impacts on the Agua Fria River WSR corridor and the riparian corridor in the Hassayampa River

Canyon Wilderness. Wildlife habitat would likely be improved, and wildlife and livestock would compete less for resources during the winter. Improving vegetation and forage conditions would also benefit wilderness areas by improving natural and natural-appearing ecological conditions, enhancing wilderness values and improving visitor's experience.

Alternative C

Impacts of applying the Land Health Standards and Rangeland Management guidelines would be the same as for *Alternative A*.

Impacts to the riparian corridors would be similar to those described for *Alternative B*, except that the year-round restriction of grazing should eliminate all competition between wildlife and livestock for resources in the WSR and riparian corridors. Habitat should be further improved, enhancing the wildlife and scenic values of the eligible WSR segments of the Agua Fria River and in Hassayampa River Canyon Wilderness.

Alternative D

Because *Alternative D* would eliminate grazing, impacts would be similar to those described for *Alternative C*.

***Alternative E* (Preferred Alternative)**

Impacts would be the same as described for *Alternative B*.

4.6.10 From Minerals Management

***Alternative A* (No Action)**

Minerals management under *Alternative A* is not expected to affect Agua Fria National Monument as the monument is closed to all forms of mineral entry, leasing, and sales except for casual use and valid existing rights on existing claims.

Mining near wilderness areas, in ACECs, and along back country byways could reduce solitude in some areas; increase noise, dust, and traffic; and detract from the visual setting. The potential for leasable and locatable minerals is very low, and areas with locatable potential are not near wilderness areas. Areas of potential saleable minerals (e.g. sand and gravel) are near rivers and washes and are not near wilderness areas. Decorative rock and other saleable mineral operations exist in the Bradshaw-Harquahala Planning Area; however, did not affect the findings of wilderness values. Future requests for similar development near wilderness areas could have impacts as described, but potential areas for such operations are unknown.

Alternative B

As in *Alternative A*, no impacts are expected on Agua Fria National Monument.

Closing Tule Creek ACEC to all mineral development would benefit the biological and cultural resources that are relevant and important to ACEC designation by eliminating the potential for disturbing and damaging these resources.

Impacts of mineral development on wilderness areas, back country byways, and ACECs would be the same as described for *Alternative A*.

Alternative C

No impacts are expected on Agua Fria National Monument.

Closing Tule Creek ACEC and Sheep Mountain RNA to all mineral development would have impacts similar to those described for *Alternative B*.

Alternative D

No impacts are expected on Agua Fria National Monument.

Impacts from managing Tule Creek ACEC would be similar to those described for *Alternative B*.

Closing Baldy Mountain ONA ACEC to all forms of mineral entry would benefit Hells Canyon Wilderness by reducing the potential area susceptible to ground disturbance and maintaining primitive open space. The potential for disturbance from leasable and locatable mineral development would be eliminated and the natural open space and resources of the ONA ACEC would be maintained.

***Alternative E* (Preferred Alternative)**

Impacts would be the similar to those under *Alternative D*.

4.6.11 From Fire Management

***Alternative A* (No Action)**

Under the No-Action Alternative, fire would be managed throughout the planning area according to the *Arizona Statewide Land Use Plan Amendment for Fire, Fuels and Air Quality Management, September 2003.*

Agua Fria National Monument grasslands are a fire-adapted ecosystem with a 0–35-year fire return frequency. As fire continues to be used as a natural process to restore ecosystem health, the national monument's grasslands would continue to be subject to prescribed burning. The burning would affect the WSR corridor through vegetation mortality and blackening of the landscape in grasslands that extend into the corridor. Prescribed burning would reduce the visual values in the corridor over the short term, until vegetation regenerates. Air quality and visibility would also decline during the burn period, and the decline could temporarily diminish the visual setting and character of the corridor.

As stated in the Statewide LUP Amendment for Fire, Fuels and Air Quality Management, fire management would try to avoid altering the natural character of special area designations. Should a prescribed fire escape containment, however, more damage to riparian vegetation could occur in the WSR corridor. The damage could further degrade the visual character and habitat in the corridor and diminish the remarkable values that led to WSR eligibility.

Use of prescribed fire could affect the WSR corridor by initially increasing runoff and erosion along the Agua Fria River in the national monument. This outcome could temporarily decrease water clarity, increase sedimentation, and diminish the corridor's visual character.

Over the long term, use of fire as a natural process in the national monument should lead to increased ecosystem health and enhanced habitat that would maintain the remarkable visual and habitat values of the corridor that led to WSR eligibility.

Fire suppression could degrade wilderness areas by using mechanized equipment and aircraft. Impacts would include the temporary increase in noise that would diminish opportunities for solitude in other areas of the affected wilderness area. Use of mechanized equipment would leave visible ground disturbance that could remain for long periods. Retardant use could leave visible residue on the landscape for several years. The same impacts could alter the setting and character of the landscape near the Harquahala Mountain Summit Road Scenic Byway and temporarily diminish the scenic quality of the byway travel experience.

***Alternatives B, C, D,* and *E* (Preferred Alternative)**

Impacts from fire management would be similar to *Alternative A*, including temporary impacts at the northwest and eastern end of Hassayampa River Canyon Wilderness. Visitors would be restricted from parts of the wilderness during prescribed burns. The fire damage would detract from the visual setting for users until the vegetation recovers.

4.6.12 From Wild Horse and Burro Management

***Alternative A* (No Action)**

Current conditions would be maintained. Sufficient wilderness values were found to designate the Hummingbird Springs, Harquahala Mountains, Big Horn Mountains, and Hells Canyon Wilderness Areas, with burros present in the existing Herd Areas (HAs) that encompass parts of these areas. While management in the *Lower Gila North Management Framework Plan* (BLM 1983) called for the herd level in the Harquahala HA to be zero, the action was not completed. The current impacts of vegetation damage, soil and vegetation trampling in gathering areas, and trailing (or creating multiple new paths across the landscape) would continue to diminish the natural setting in localized parts of the wilderness areas, especially near water sources and in canyons. Natural landscape settings would continue to exist in most portions of the wilderness areas.

Alternative B

The impacts of retaining the current burro herd level would be the same as under *Alternative A* for all wilderness areas.

***Alternatives C, D,* and *E* (Preferred Alternative)**

Removing burros from the Harquahala HA would eliminate impacts to the Harquahala Mountains, Hummingbird Springs, and Big Horn Mountains Wilderness Areas. Trailing and vegetation impacts now occurring in Hells Canyon Wilderness would continue.

4.6.13 From Management of Transportation and Public Access

***Alternative A* (No Action)**

No impacts are expected from current management of transportation and public access on existing ACECs, the five wilderness areas, or the Harquahala Mountain Summit Road Back Country Byway.

Under current WSR interim management, vehicle routes and developments are currently restricted to protect outstandingly remarkable values, including riparian habitat and wildlife. Therefore, no impacts are anticipated on the proposed suitable WSR segments within the Agua Fria National Monument

Alternatives B* and *C

The effects from transportation and public access route designations associated with establishing the Hieroglyphic Mountains Special Recreation Management Area (SRMA) could concentrate off-highway vehicle (OHV) use, increase traffic, and increase noise at the southwest edge of the Hells Canyon wilderness. These effects could diminish the sense of solitude and natural quiet for wilderness visitors. Greater levels of fugitive dust could potentially enter Hells Canyon Wilderness, obscuring vistas.

Impacts on suitable WSR segments would be the same as for *Alternative A*.

Alternative D

Managing the Hieroglyphic Mountains SRMA to facilitate phasing out and restricting motorized recreation and motorized trails over a 10 to 20 year period could enhance the non-motorized recreation settings and opportunities within the Hells Canyon wilderness. The sights and sounds of motorized activities and fugitive dust entering the wilderness from vehicle travel would be lessened or eliminated when SRMA motorized routes are closed or use is restricted. In the interim time period (less than 20 years), impacts to the Hells Canyon wilderness from motorized activities would be similar to those described under *Alternative B*.

Impacts on suitable WSR segments would be the same as for *Alternative A*.

***Alternative E* (Preferred Alternative)**

Impacts on special area designations from management of transportation and public access would be similar to those described for *Alternatives B* and *C*.

4.6.14 from Management of Wilderness Characteristics

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred)**

The management of certain lands to maintain or enhance wilderness characteristics would have no direct effects on existing special area designations. The social, physical, and managerial conditions and settings desired on lands managed for wilderness characteristics, are compatible with public lands currently managed as Areas of Critical Environmental Concern, Back Country Byways, and Wilderness Areas. Indirect benefits from management of wilderness characteristics could indirectly influence lands with special area designations as the allocation maintains undeveloped settings, offers dispersed non-motorized recreation experiences, enhances natural quiet and dark sky conditions, potentially reduces fugitive dust emissions, safeguards intact scenery and landscape vistas, and secures more intact wildlife habitats.

4.7 Impacts on Lands and Realty Management

This analysis addresses both the entire current inventory of BLM's surface lands in the planning areas and lands in the planning areas considered for acquisition because of their resources. These lands include 967,000 surface acres, with 896,100 acres of BLM's land in the Bradshaw-Harquahala Planning Area and 70,900 acres of BLM's land in Agua Fria National Monument. Interspersed in the Federal lands are parcels that might be available for acquisition from a willing seller. For the Bradshaw-Harquahala area, demands on Federal land management in and around the Phoenix metropolitan area resulting from rapid urbanization would be fulfilled by the following:

- land tenure management prescriptions, (including disposal and acquisition),
- Recreation and Public Purposes (R&PP) leases or patents,
- right-of-way authorizations, and
- land use permit management prescriptions.

Each of the large tracts of BLM land is next to large tracts of State land. Because the future legislative framework governing State land transactions is uncertain (including the potential for the exchange of land between the Arizona State Land Department (ASLD) and the Federal Government, State land is assumed for this analysis to be ineligible for development.

The impact analysis employed land use modeling completed for BLM for the planning area to show the distribution of residential growth between the years 2000 and 2025 (Appendix M). The land use model is consistent with the undeveloped land base shown in the general and comprehensive plans of each city or town and both counties.

The model was run four times, once each for the four Alternatives for BLM's land available for disposal. The model assumes that all BLM's land eligible for disposal would change from Federal to private ownership during the planning period 2005 to 2025, and then would undergo residential development. Other than BLM's land, the model assumes that the amount of suitable vacant land available for residential growth for Maricopa and Yavapai Counties would be the same under all of the Alternatives.

The model uses one set of assumptions about such factors as follows:

- persons per household,
- lot sizes, and
- the tendency for new housing to be attracted to areas next to areas that already have housing.

The model assumes that the availability of BLM's land for development would not induce growth countywide or increase the total population projected for the two counties in 2025. Both counties are already undergoing rapid growth, yet both counties already have a vacant residential land capacity that would meet the need for growth beyond 2025. Therefore, the availability of BLM's land for development would affect the phasing of land development on the vacant residential land, rather than the development projected for 2025.

For Agua Fria National Monument the land tenure management prescriptions, (acquisition only) right-of-way authorizations, and land use permit management prescriptions would fulfill the protective purposes of the national monument.

The broad categories of land uses requiring right-of-way grants are the following:

- electrical generation,
- transmission, and distribution systems,
- oil and gas related systems,
- telecommunication transmission and reception systems,
- transportation systems, and
- water-related systems.

The common land uses requiring permits are commercial photography, apiaries, geological and hydrological testing, and some military activities. The recipients of R&PP leases or patents are State and local governments and qualified non-profit organizations.

This analysis also addresses the impacts on designated right-of-way corridors on BLM's land in the planning areas.

The resolution of mining claims has a bearing on the sequence of land disposal. When someone expresses an interest in acquiring land that BLM has proposed for disposal, under the Federal Land Transaction Facilitation Act (FLTFA) the land is temporarily closed to the filing of mining claims. Typically, the prospective new owner purchases any claims and relinquishes them to BLM, at which point the mining claim is resolved. Generally, BLM prefers to dispose of the surface and subsurface mineral rights to the same new owner, and the above-described relinquishing of mining claims typically results in such disposal of surface and subsurface.

Occasionally, BLM keeps the subsurface in Federal ownership when it is deemed to be in the public interest for BLM to continue to control the potential for future mining.

Issuing rights-of-way where there are active mining claims is routine and covered by legislation and regulation. The right-of-way purchaser or permittee is informed of the rights of the mining claimant. Mining might intermittently or temporarily obstruct the right-of-way.

4.7.1 From Special Area Designations

***Alternative A* (No Action)**

Wilderness areas would remain closed to rights-of-way and land use authorizations. BLM would try to acquire non-Federal wilderness in-holdings when there are willing sellers or the potential for a land exchange. Acquiring in-holdings would block up Federal ownership in sensitive resource areas.

Alternative B

Special area designations generally constrain lands and realty activities in the following ways:

- limiting the lands open to exchange or disposal in any zone,

- reducing the demand for the number and type of realty use authorizations,
- restricting the ability to build or relocate roads for legal access, and
- eliminating options of authorization or conveyance of land to resolve a trespass.

Special area designations might require mitigating or relocating an activity. For example, mitigation for conflicts is permissible to achieve no net loss in amount or quality of desert tortoise habitat while accommodating requests for rights-of-way, easements, withdrawals, or other land tenure actions. At the most, the activity might be prohibited altogether.

None of the proposed special area designations are located in areas slated for development between 2005 and 2025 in Maricopa, Yavapai, or La Paz Counties. None of the special area designations are in a location that would otherwise be a part of the most direct route for workers to commute to work. In addition, the special area designations are generally a part of the open space designated in the general plans of the counties and municipalities. Therefore, the special area designations would not preclude developing a typical urban transportation network in the planning area.

Tule Creek ACEC (640 acres) is proposed for designation in the Bradshaw-Harquahala Planning Area, and stipulations consistent with its protection would be written into any future land use authorizations in the ACEC. The locations could be affected, or the terms of use of access easements and rights-of-way could be restricted to protect Tule Creek.

The effects of wilderness areas would be the same as in *Alternative A.*

Alternative C

Lands adjoining Harquahala Mountains ACEC would be of higher priority for acquisition than other lands because of their biological and cultural values. Therefore, these lands might be acquired instead of other lands.

Black Mesa ACEC would be established to protect significant cultural resources. To the west of Interstate 17, the utility corridor width of 2 miles would allow for flexibility in planning and designing transmission facilities to avoid impacts to archaeological sites. The presence of the interstate highway provides some protection by limiting public access to these sites. In coordination with the Arizona Department of Transportation (ADOT), BLM would implement measures to mitigate the effects to archaeological sites of widening and maintaining the highway.

The effects of wilderness areas would be the same as *Alternative A*

The impacts from Tule Creek on lands actions would be the same as those under *Alternative B.*

Alternative D

Designating the Agua Fria Riparian Corridor ACEC in Agua Fria National Monument would constrain the location of rights-of-way in the Black Canyon corridor. In the Bradshaw-Harquahala Planning Area acquiring private and State in-holdings and adjacent lands (provided the seller is willing) to protect biological resources in the Belmont-Big Horn Mountains would give these lands a higher priority area for acquisition than in-holdings without similarly high biological values. As such, BLM might acquire these lands instead of the other lands.

As in *Alternative B*, lands adjoining Harquahala Mountains ONA would also be of higher priority for acquisition than other lands because of biological and cultural values.

The impacts on lands and reality management of designating Tule Creek ACEC would also be the same as under *Alternative B.*

The effects of wilderness areas would be the same as in *Alternative A.*

No new rights-of-way would be permitted in the Baldy Mountain ONA, so private interests needing vehicular or utility access to private

lands could have to use a more circuitous and potentially more expensive route.

***Alternative E* (Preferred Alternative)**

Impacts are the same as under *Alternative A.*

4.7.2 From Lands and Realty Management

***Alternative A* (No Action)**

In Agua Fria National Monument public land ownership would not change. These retained lands would be managed according to the guidelines set forth in the proclamation designating the monument (Appendix A).

BLM could issue no leases or patents in the monument to local governments or non-profit organizations under the R&PP Act.

Since no communication sites would be designated within the monument, industry would rely on existing sites, which might not meet suitable industry needs. Industry would also rely on current transportation corridors, which might not be adequate to meet future demand needs.

Land ownership in the Bradshaw-Harquahala Planning Area would remain unchanged from existing management practices.

Lands suitable for R&PP use would be issued on a case-by-case basis to local governments and non-profit organizations under the R&PP Act.

Alternative A would continue Lands and Realty management as it is now occurring. As a result, no impacts would be expected.

Alternative B

Impacts in Agua Fria National Monument would be similar to *Alternative A*, except that the existing corridor would be narrowed so that the eastern boundary of the utility corridor would follow the easternmost boundaries of any existing rights-of-way in the corridor. The corridor boundary in the Bradshaw-Harquahala Planning Area would compensate for the monument boundary narrowing by widening the corridor 1 mile to the west of Interstate 17. Future utility uses would then be forced to locate in undisturbed areas, resulting in possible increased costs for industry.

The total acreage of public land ownership in the Bradshaw-Harquahala Planning Area would depend on whether all lands recommended for acquisition are acquired. The lands consolidated in the five Management Units (MUs) would improve management efficiency and would likely reduce management costs.

Impacts of land leases and patents for R&PP would be the same as *Alternative A.*

Impacts of major rights-of-way and communication sites would be similar to *Alternative A*, except no new communication sites could be designated, and these facilities could not proliferate. This situation would allow for the orderly development of these facilities in designated sites, eliminating user conflicts. As technology continues to advance, BLM might have to review its decisions to determine if its plan is meeting industry needs. Multiple new utility corridors, including all State route highway systems (including the proposed Wickenburg Bypass), would be designated as corridors across public lands. Designating corridors would prevent the proliferation of major utility systems across public lands.

Land use authorizations would be precluded or restricted on lands in the MUs, decreasing the location flexibility for rights-of-way and increasing construction costs for utility rights-of-way.

Alternative C

The impacts of public land ownership and R&PPs in the national monument would be the same as *Alternative A.*

BLM would issue no leases or patents for land within the monument to local governments or non-profit organizations under the R&PP Act.

Rights-of-way and communication sites in the monument would be similar to *Alternative B*, except that the existing corridor would be eliminated from the monument. The corridor boundary in the Bradshaw-Harquahala Planning Area would be adjusted to make up for the loss of the corridor in the monument boundary by being widened 2 miles to the west of Interstate 17. Future utility uses would then be forced to locate in undisturbed areas, possibly increasing costs for industry.

Public land ownership in the Bradshaw-Harquahala Planning Area would be similar to *Alternative B*, except that the lands would be consolidated into six MUs

Impacts of land leases and patents for R&PP use would be the same as *Alternative A.*

Land use authorizations (including rights-of-way, communication site leases, and utility corridors) would be the same as *Alternative B.*

Alternative D

The impacts of public land ownership and R&PPs in the national monument would be the same as *Alternative A.*

Impacts of new rights-of-way within the monument would be similar to *Alternative B,* except that the corridor in the Bradshaw-Harquahala Planning Area would be extended, not widened so that it would be continuous north and south on BLM's lands. Any future need to locate utilities in the corridor would not be met, creating a need to locate elsewhere and increasing industry costs. This limitation could also restrict any future attempts to widen Interstate 17 as potential growth warrants.

Public land ownership in the Bradshaw-Harquahala Planning Area would be similar to *Alternative B*, except that the lands would be consolidated into seven MUs.

Impacts of land leases and patents for R&PP use would be the same as *Alternative A.*

Land use authorizations (including rights-of-way, communication site leases, and utility corridors) would be similar to *Alternative B*, except that no new electric or gas corridors would be designated. As the potential demand for electricity and gas increases, the supply would not be sufficient. Costs might increase because of a lack of resources.

***Alternative E* (Preferred Alternative)**

The impacts of public land ownership and R&PPs in the national monument would be the same as *Alternative A.*

Impacts of new rights-of-way within the monument would be the same as *Alternative B.*

Public land ownership in the Bradshaw-Harquahala Planning Area would be the same as *Alternative C.*

Impacts of land leases and patents for R&PP use would be the same as *Alternative A.*

Land use authorizations (including rights-of-way, communication site leases, and utility corridors) would be the same as *Alternative B.*

4.7.3 From Management of Soil, Air, and Water Resources

Alternatives A, B, C, D,* and *E

In all Alternatives, efforts to minimize impacts to soils, water, and air would result in increased project costs and may result in project redesign or a shifted location. All permitted activities within air quality nonattainment areas would be required to meet county standards and incorporate county stipulations into their project proposal. For qualifying projects, meeting air quality standards may increase project costs.

4.7.4 From Biological Resource Management

***Alternatives A* (No Action), *B, C, D* and *E* (Preferred Alternative)**

Acquisition of lands to enhance BLM's management of habitat critical to threatened or endangered species as well as habitat for other sensitive species is given a high priority and would result in acquisition of those areas in preference to other areas. Biological resource management would otherwise not affect lands and realty management in either planning area.

4.7.5 From Cultural Resource Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

The potential discovery of cultural and historical sites across public lands could cause BLM to restrict land use authorizations. Land use authorizations might have to be relocated/ rerouted, or a treatment plan might have to be developed to include mitigation measures, such as scientific data recovery. Such measures could prove to be expensive, resulting in projects that are uneconomical to complete.

4.7.6 From Paleontological Resource Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

Since no known areas with paleontological resources occur within the planning areas, no impact is expected.

Should paleontological resources be discovered, BLM could restrict land use authorizations. Land use authorizations might have to be relocated/rerouted, or a treatment plan might have to be developed to include mitigation measures, such as scientific data recovery. Such measures could prove to be expensive, resulting in projects that are uneconomical to complete.

4.7.7 From Recreation Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

Recreation management would not affect lands and realty management under any of the Alternatives.

4.7.8 From Visual Resource Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

VRM would only slightly affect lands and realty management under any of the Alternatives. In VRM Class I and II areas, rights-of-way would be buried, relocated as needed, or otherwise designated to be compatible with their surroundings to ensure scenic integrity. BLM would not approve land use authorizations that are inconsistent with VRM Class I and Class II, thus creating the need to select a more suitable location. Such a situation could prove to be costly to certain project proposals.

4.7.9 From Rangeland Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

Rangeland management would not have any expected impacts on lands and realty management under any of the Alternatives.

4.7.10 From Minerals Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

Minerals management would not have any expected impacts on lands and realty management under any of the Alternatives.

4.7.11 From Fire Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

Fire management would not have any expected impacts on lands and realty management under any of the Alternatives.

4.7.12 From Wild Horse and Burro Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

Wild horse and burro management would not have any expected impacts on lands and realty management under any of the Alternatives.

4.7.13 From Management of Transportation and Public Access

***Alternative A* (No Action), *B, C, D* and *E* (Preferred Alternative)**

There are no impacts expected in this area.

4.7.14 From Management of Wilderness Characteristics

***Alternative A* (No Action)**

Currently, there are no areas specifically managed for wilderness characterisitcs. Resulting in no expected impacts.

***Alternatives B, C, D* and *E* (Preferred Alternative)**

In any proposed Alternative, the allocations to maintain or enhance wilderness characteristics would be closed to rights-of-way and inconsistent land use authorizations. Future utilities and private requestors for access would be required to find other alternative routes through these areas. Land use authorizations in these areas would only be slightly affected.

4.8 Impacts on Soil Resources

4.8.1 From Special Area Designations

***Alternative A* (No Action)**

Under current management of Agua Fria National Monument, soil resources in the Perry Mesa ACEC (9,580 acres) would likely be protected from increased erosion and soil loss; and from decreased soil moisture and productivity by limiting motor vehicle use. However, current management would not affect soil resources there because of the inaccessibility of the Larry Canyon ACEC to both livestock and motor vehicles. Similar to Larry Canyon ACEC, most of the eligible WSR corridors (6,030 acres) are in narrow, inaccessible canyons where there are few conflicts with the nonimpairment provisions of current interim management. Some places in the northern reaches of the Agua Fria River are accessible by vehicles. Restrictions on vehicular

use of interim management should maintain or improve soil productivity and reduce soil loss. All of the Special Management Areas (SMAs) in the national monument are in areas of moderate potential soil erodibility with some small areas of severe and extremely severe potential soil erodibility.

Existing management of Congressionally Designated Wilderness (96,820 acres) would maintain current soil productivity by imposing management restrictions on activities.

Alternative B

In Agua Fria National Monument, interim management of the eligible WSR corridor under *Alternative B,* would be the same as described for *Alternative A.* Removing the ACEC designation in Larry Canyon and on Perry Mesa would not affect the soil because the same activities limited by the ACEC designation would be limited under the national monument designation. Removal of these ACECs would not affect soils.

In the Bradshaw-Harquahala Planning Area closing the fenced area of the Tule Creek ACEC to motorized vehicles and grazing could benefit soil resources by reducing soil disturbance and compaction. Therefore, this area is rated to have slight potential soil erodibility. Reduced soil disturbance would result in slightly reduced erosion and increased soil infiltration and productivity.

Alternative C

In Agua Fria National Monument, the four designated ACECs are all in areas with moderate to very severe potential soil erodibility. Management actions for these ACECs would only negligibly affect soil resources beyond protections afforded by the national monument proclamation (Appendix A). Interim management of the eligible WSR corridor would be the same as described for *Alternative A*.

In the Bradshaw-Harquahala Planning Area the protective measures of designating six ACECs, totaling 55,710 acres would reduce soil erosion and improve soil moisture and productivity. These areas are rated to have slight potential soil erodibility.

Alternative D

Impacts from the ACECs and eligible WSR corridors in Agua Fria National Monument would be the same as those described for *Alternative C*. In the Bradshaw-Harquahala Planning Area eight ACECs, totaling 244,090 acres are proposed; impacts to soil resources would be similar to those under *Alternative C*.

***Alternative E* (Preferred Alternative)**

Impacts from the special area designations in Agua Fria National Monument would be the same as those described for *Alternative C.* In the Bradshaw-Harquahala Planning Area four ACECs, totaling 89,970 acres are proposed; impacts to soil resources would be similar to those under *Alternative C.*

4.8.2 From Lands and Realty Management

***Alternative A* (No Action)**

Activities subject to valid existing rights in the national monument might continue, and applications, proposals, and future use requests that were pending when the national monument was created are subject to the terms of the monument proclamation (Appendix A). These activities could degrade soil resources if construction-related erosion, soil disturbance, or compaction occurs. These disturbances are temporary; therefore, long-term changes to soil resources would not be probable.

Impacts to soil resources from utility and transportation corridors, and communication sites are not expected under the current management of Agua Fria National Monument.

In the Bradshaw-Harquahala Planning Area disposal and consequential development of lands

could result in long-term reductions in soil productivity. Acquiring lands would not be expected to affect soil resources.

Building small utility distribution systems could affect soil resources if construction-related erosion, soil disturbance, or compaction occurs. These disturbances are temporary; therefore, long-term changes to soil resources might not be probable.

Building major utility lines in existing corridors could affect soil resources, mainly from development, service roads, and increased traffic. Additionally, road building could degrade soil resources by erosion, soil disturbance, or compaction.

***Alternatives B, C, D,* and *E* (Preferred Alternative)**

In Agua Fria National Monument no impacts are expected from land tenure adjustments, utility and transportation corridors, or communication sites.

In the Bradshaw-Harquahala Planning Area impacts to soil resources from utility and transportation corridors and communication sites would be similar to those discussed for *Alternative A*. Impacts to soil resources from utility and transportation corridors, and telecommunication sites would also be similar to those discussed for *Alternative A*.

4.8.3 From Management of Soil, Air, and Water Resources

***Alternative A* (No Action)**

Impacts to soil resources in Agua Fria National Monument are expected from the following:

- maintaining and improving soil cover and productivity through erosion preventative measures and land treatments;
- implementing activity plans to maintain or increase ground cover that would improve infiltration, permeability, soil moisture storage, and soil stability; and
- implementing watershed improvement projects to increase ground cover and reduce erosion.

Under the current management of the Bradshaw-Harquahala Planning Area no impacts are expected on soil resources.

***Alternatives B, C, D,* and *E* (Preferred Alternative)**

Impacts to soil resources are expected to be similar to those in *Alternative A.*

4.8.4 From Biological Resource Management

***Alternative A* (No Action)**

In Agua Fria National Monument improvements to soil resources are expected from the following:

- improving the Agua Fria River riparian corridor by mitigating past impacts and implementing management actions to protect soils,
- reducing soil erosion by planting cottonwood and willow along the Agua Fria River and its tributaries, and
- discontinuing the use of vegetation chaining and other vegetation manipulation methods that substantially disturb the surface.

In the Bradshaw-Harquahala Planning Area impacts to soil resources are expected from the following:

- developing projects, including springs, seeps, and other features affecting water;
- maintaining or enhancing spring/riparian habitats in the planning unit. Sites would be determined in the Habitat

Management Plan (HMP) to meet the plan's goals; and
- reducing competition for cover, water, and space among big game, livestock, and burros by reducing livestock aggregations and removing all burros at waters in the Big Horn, Granite Wash, and Harquahala Mountains.

Soil resources might slightly improve from all of these activities.

***Alternatives B, C, D,* and *E* (Preferred Alternative)**

Impacts would be similar to those described in *Alternative A.*

4.8.5 From Cultural Resource Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

There are no impacts expected to soil resources from cultural resource activities under any alternative.

4.8.6 From Paleontological Resource Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

There are no impacts expected to soil resources from managing paleontological resources under any alternative.

4.8.7 From Recreation Management

***Alternative A* (No Action)**

Under the current management of Agua Fria National Monument, areas of concentrated recreation could result in the loss or reduction of vegetation cover, compaction of soils, and streambank instability in riparian areas, thus decreasing soil moisture and productivity.

OHV use designations vary between the east and west parts of the Bradshaw-Harquahala Planning Area. In the area covered by the Phoenix RMP (BLM 1988a), vehicle travel is limited to existing roads and trails except for areas closed or restricted to designated roads and trails. West of Highway 93, unlimited cross-country OHV use is allowed except in wilderness and other designated areas.

Increasing visitor use and vehicle travel in the area addressed by the Phoenix RMP would intensify soil erosion due to increasing numbers of OHV users and poorly engineered or non-engineered trails and routes. Despite users being confined to existing routes, erosion could increase on OHV trails ascending steep terrain and crossing unstable soils on hillsides. Overall, impacts from OHV use on soils are expected to be less than in other parts of the Bradshaw-Harquahala Planning Area as users are now restricted to using existing routes.

West of Highway 93, increased soil erosion is expected from increased visitation, multiplying numbers of routes, and greater use of OHVs on steep slopes. Bank washes would be broken down and made unstable in wash "play" areas. Soil damage and erosion could result from surface disruption, soil compaction, and damage to soil-holding plants. Furthermore, soils could be permanently damaged on steep slopes and across loosely graveled gentle slopes. Vehicle tracks on the lands here, especially desert pavement surfaces and hillsides, could last for 60 years or perhaps centuries, from evidence of Native American artwork and tread marks from World War II desert training exercises.

Under the current management of the areas west of Highway 93 and north of Wickenburg, areas of concentrated recreation and OHV use could result in the loss of or reduced vegetation cover, soil compaction, and streambank instability in riparian and wash areas, thus reducing soil moisture and soil productivity.

Moreover, the lack of OHV-related management facilities and amenities would contribute to increasing damage to soils across the Bradshaw-Harquahala Planning Area. Vegetation and infiltration could decrease, wash bank and riparian area stability would decline throughout the area, and increased amounts of soil would be exposed to erosion and compaction.

All new routes would be built in ways intended to minimize soil disturbance, erosion, and compaction.

Alternative B

In Agua Fria National Monument 57,900 acres of Front Country, 12,700 acres of Back Country, and 300 acres of Passage RMZs would be established, and recreation uses and opportunities in the zones would be managed for protecting natural resources. Impacts to soil resources, including increased surface disturbance and erosion, might occur in the Front Country and Passage RMZ as recreation use increases. However, impacts are not expected in the Back Country RMZ.

In the Bradshaw-Harquahala Planning Area route, closures in Tule Creek ACEC and allocations to maintain or enhance wilderness characteristics within the Castle Hot Springs and Harquahala Management Units, would slightly reduce soil disturbance, erosion, and compaction by OHV use. Some of these routes are in soil mapping units with moderate potential soil erodibility, but most are in slight potential erodibility.

Soil erosion from improper events and OHVuse would be lessened by implementing vehicle route designations throughout the Bradshaw-Harquahala Planning Area along with well-planned, sited, and signed special recreation management areas (SRMAs) addressing intensive recreation. Included would be both motorized and non-motorized uses in the Table Mesa, the Hieroglyphic Mountains, Stanton, Wickenburg, San Domingo Wash, and Vulture Mine SRMAs. Facilities and outreach/education would lessen improper OHV activities, further decreasing soil erosion, disruption, and compaction.

Alternative C

Impacts on the national monument would be similar to those discussed for *Alternative B* and would occur on moderate to very severe soil erodibility areas on 42,410 acres of Front Country RMZ and 70 acres of Passage RMZ.

In the Bradshaw-Harquahala Planning Area impacts from recreation management would be similar to those discussed for *Alternative B*. Reducing vehicle travel routes and use in Harquahala Mountains ONA, and the allocations to maintain or enhance wilderness characteristics within the Black Canyon MU, the Hassayampa MU, and the Harquahala MU, would reduce recreation and OHV-related erosion, compaction, and surface disruption of soils. Some of these routes are in soil mapping units with moderate potential erodibility areas, but most are in slight potential erodibility.

Implementing well-planned, sited, and managed SRMAs addressing intensive recreation, including both motorized and non-motorized use, and vehicle route designation throughout the planning area would lessen soil erosion from improper events and intensive OHV use. Associated facilities and outreach/education efforts would lessen improper OHV activities, further decreasing soil damage.

Alternative D

Impacts on the national monument would be similar to those discussed for *Alternative C* and would occur on moderate to very severe soil erodibility areas on 1,530 acres of the Front Country RMZ and 990 acres of the Passage RMZ.

Phasing out OHV use of the Hieroglyphic Mountains SRMA would eventually reduce the potential for soil disturbance, compaction, and erosion caused by motorized activities on 16,510 acres. The overall management of the Castle Hot Springs Management Unit (MU) as a

regional recreation management area would reduce soils impacts in the southern portion of the MU by phasing out motorized uses. As routes are reclaimed or are reduced in width for non-motorized use, cover vegetation would increase, increasing infiltration and reducing the amount of soil exposed to erosion and compaction.

The specified management of special recreation management areas (SRMAs) and restricting vehicle use to designated routes would further reduce soil impacts in all other parts of the planning area. Increased BLM signing, OHV route development and connectivity, public education, and better managed motorized and non-motorized recreation under *Alternative D* would lessen impacts to soils over the long term. As routes are designated, reclaimed, or reduced in width for non-motorized use, cover vegetation would increase, increasing infiltration and reducing the amount of soil exposed to erosion and compaction.

***Alternative E* (Preferred Alternative)**

In this alternative, 57,200 acres would be allocated to Back Country, 12,440 to Front Country, and 1,300 acres to Passage RMZs. Impacts on the national monument would be similar to those discussed for *Alternative C* and *D*, except that 70 miles of route would be closed and 1 mile of new route built. The net reduction of routes would be 69 miles. These route closures would likely reduce soil disturbance, erosion, and compaction by OHV use. All of the routes that would be closed or opened are located in moderate to very severe potential soil erodibility areas.

Soil erosion caused by vehicular travel would be curtailed by eliminating vehicle use in Tule Creek ACEC, and by reducing vehicle routes and cross-country travel in allocations to maintain or enhance wilderness characteristics and the Harquahala Mountains and Black Butte ONAs. Curtailing or reducing vehicle use in the above areas would benefit soil resources by eventually reducing the potential for soil disturbance, compaction, and erosion caused by motorized activities.

The overall management of the planning areas, along with the allocation of recreational vehicle use to designated routes only, would reduce impacts to soils in all parts of the planning area. Increased BLM signing, route development, route connectivity, and better managed motorized and non-motorized recreation would lessen potential impacts to soils over the short and long term. As routes are designated, reclaimed, or reduced in width for non-motorized use, cover vegetation would increase, increasing infiltration and lessening the amount of soil exposed to erosion and compaction.

4.8.7.1 From Special Recreation Permit Program

***Alternative A* (No Action)**

The predominant impacts to soils from the SRP program are soil compaction and accelerated erosion from concentrating activities in certain areas. Broken soil crusts and decreased vegetation cover exposes more soil to potential erosion and reduce infiltration. Most SRPs are issued for activities, such as jeep tours, horse events, and guided big game hunts, which occur on existing routes or disturbed areas and create minimal soil impacts. It is standard operating procedure to conduct environmental analysis before any SRP is authorized. Consequently, any permitted activities that could cause adverse impacts to soils are mitigated to minimize those impacts and rehabilitation is required when necessary.

Within the national monument, few SRPs are currently issued; for instances, those permitted have been for commercial tour groups and for hunting guides. These permits use areas where similar activities have been taking place for many years and have been determined to have little or no impact.

In the Bradshaw-Harquahala Planning Area, the permitted recreation activity that causes the most

disturbances to soils are the three motorized competitive races that are held annually. Currently, the soil impacts from these races are closely monitored and the soils are rehabilitated as close to pre-race conditions as possible. However, under *Alternative A*, an unlimited number of competitive races could be authorized between October 15 and March 31, and in areas currently not used for such activities. Thus, without any set limitations on the number of races and the areas in which they can occur, this increased vehicle activity will inevitably lead to unacceptable cumulative soil impacts, perhaps most notably in previously undisturbed areas.

Limited staffing will make it difficult to adequately manage and mitigate the effects from such use including increased soil compaction and vegetation disturbance in camping and staging areas. Moreover, depressions, holes, rills, and deep ruts will become more visible and larger gullies will form due to poor drainage during heavy rains. Routes used for the racing activities will be impacted from the racing vehicles churning up the soils on the routes, and breaking soil crusts due to vehicle passing, accidents or course cutting. More soil berms will be created at curves and corners which will lead to increased wind and water erosion. Areas with finer soils will be especially affected and difficult to rehabilitate. Even with close monitoring and rehabilitation efforts, due to the arid desert conditions, once soil crusts are disturbed and barren soil is exposed they can take a long time to recover.

Alternative B

In the Agua Fria National Monument, BLM would issue up to 12 permits per year. This is a 400 percent increase over the current situation and could lead to additional soil disturbance in new areas as permittees seek new locations for activities to avoid crowding. However, due to the monument proclamation requiring the protection of monument objects, permit requests will be scrutinized and permit activities closely monitored so soil impacts are expected to be slight.

For the Bradshaw-Harquahala Planning Area, impacts to soil resources from SRPs other than the competitive races would be similar to those discussed in *Alternative A,* except that the number of permits would be expected to increase. However, due to continuing implementation of mitigation measures the impacts to soils from most of the permitted activities would be expected to increase only slightly.

For competitive races, the number of races each year would be limited to 14 and additional limits would be established for the Hieroglyphic Mountains, Vulture Mountains, Stanton, San Domingo, and Table Mesa SRMAs. Races would be prohibited in the Wickenburg SRMA and in the ERMAs. However, the allowable number of races is still a substantial increase from current conditions and therefore soil impacts would be much higher. It is anticipated that these impacts could be difficult to mitigate, manage, and rehabilitate to acceptable levels if the upper end of the allowed number of races is reached.

Alternative C

For the Agua Fria National Monument, impacts to soils from SRPs would be less than those discussed for *Alternative B* as only six permits per year could be issued. While still a 200% increase over current conditions, this would lead to a slight, if any, increase in soil disturbance.

In the Bradshaw-Harquahala Planning Area impacts to soils from SRPs other than races would be the same as those described for *Alternative B*.

For competitive races, the number would be limited to six per year and no races would be allowed in the Table Mesa SRMA in addition to the SRMA limits identified in *Alternative B*. Further, set limits for Hieroglyphic Mountains and Vulture Mountains SRMA would keep the number of races near current levels thereby keeping soil impacts at existing conditions. Only one new race would be allowed in the Stanton and San Domingo SRMAs making management

of the activities more feasible in keeping soil impacts to a minimum.

Alternative D

Under *Alternative D*, BLM would not issue SRPs for the national monument; therefore, eliminating any potential impacts to soils.

In the Bradshaw-Harquahala Planning Area impacts to soils from SRPs, other than competitive races, would be the same as those described for *Alternative B*.

No competitive races would be allowed. This would eliminate any continued impacts to soils from this activity, and soils would be allowed to recover from previous races.

***Alternative E* (Preferred Alternative)**

Impacts in the national monument are expected to be similar to those described in *Alternative A*.

In the Bradshaw-Harquahala Planning Area, no permit levels would be established for SRPs other than competitive races. Permit numbers would be expected to rise over current conditions for both planning areas and soil impacts would be similar to those discussed in *Alternative B.*

Competitive races would be limited to eight per year which is slightly higher than current conditions. Impacts would be similar to those addressed in *Alternative C*, except that the number of races could increase to four per year in the Vulture Mountains SRMA. However, the soil types in this SRMA are more resilient so impacts would be expected to be slight.

4.8.8 From Visual Resource Management

***Alternative A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

There are no impacts expected to soils from management for Visual Resources.

4.8.9 From Rangeland Management

Many studies suggest watersheds exposed to moderate grazing generally have decreased vegetation cover, increased rates of soil compaction, and lower infiltration rates resulting in increased run-off during precipitation (Beeson and Doyle 1995; Bull 1997; Clifton 1989; DeBano and Schmidt 1989; Graf 1979; Kauffman et al. 1983; Myers and Swanson 1993; Rush et al. 1997; Rutherfurd et al. 1995; Ryan 1992). Increased run-off and the resulting increased erosion can deliver excess sediment into streams. The loss of stabilizing vegetation reduces soil moisture and soil productivity. Where grazing is permitted in riparian areas, cattle trampling can also destabilize streambanks, creating more sediment sources near the stream channel.

Other studies in the inter-mountain West found that livestock trampling lowers infiltration rates but that sediment yields remain uniform after vegetation cover reaches 50 percent (Dadkhah and Gifford 1980). Additionally, in semiarid and arid settings, soil compaction might be offset by soil loosening from invertebrates (e.g. termites and ants) where enough plant litter is maintained to support large invertebrate populations (Whitford et al. 1995).

***Alternative A* (No Action)**

In both planning areas, implementing the guidelines adopted in *Arizona Standards for Rangeland Health and Guidelines for Grazing Administration* (Land Health Standards) would increase ground cover, which would provide for infiltration, permeability, soil moisture storage, and soil stability suitable for the ecological sites in the MUs. Implementation would also maintain or promote enough vegetation to maintain, improve, or restore riparian-wetland functions of energy dissipation, sediment capture, groundwater recharge, and streambank

stability, thus promoting stream channel morphology (e.g. gradient, width/depth ratio, channel roughness, and sinuosity) and functions suitable for climate and landform.

Alternative B

In Agua Fria National Monument expected impacts to soil resources from rangeland/grazing management in uplands would be similar to those described for *Alternative A*. However, limiting grazing in riparian areas to the winter would encourage more rapid recovery of riparian vegetation and reduce impacts to soils from grazing.

In the Bradshaw-Harquahala Planning grazing in riparian areas would also be limited to the winter. Winter-only grazing in riparian areas would encourage more rapid recovery of riparian vegetation and reduce impacts to soils from grazing.

Alternative C

In both planning areas impacts to soils from grazing in uplands would be similar to those discussed for *Alternative B*. Some reduction in upland grazing could occur. Grazing in riparian areas would be eliminated, increasing soil cover and reducing streambank damage from grazing under *Alternative B*. For grazing allotments that lack adequate fencing, the entire pasture would be closed to grazing. *Alternative C* would substantially reduce upland grazing as well as the use of riparian areas. This adjustment could be substantial in pastures or allotments that cannot be fenced in riparian areas from the upland areas. In these cases, the whole pasture could be closed from grazing.

Alternative D

In both planning areas soils would benefit from closing livestock grazing allotments, canceling livestock authorizations for the duration of the plan, and installing fencing to control livestock use of unfenced public lands.

Alternative D would result in the greatest improvement of the current impacts from livestock grazing on soil. Soil disturbance, soil compaction, and erosion would be lower than under any of the other Alternatives.

***Alternative E* (Preferred Alternative)**

Impacts for both areas would be similar to those described for *Alternative B*.

4.8.10 From Minerals Management

***Alternative A* (No Action)**

In the Agua Fria National Monument, minerals management is not expected to affect soil resources. Existing mining claims are limited to casual use and valid existing rights. Impacts to soils, such as erosion and vegetation disturbance, would be limited to small areas under casual use.

Under the current management of the Bradshaw-Harquahala Planning Area, mining that involves building access roads, is likely to disturb soils. Road building would increase soil erosion, disturbance, and compaction.

Should exploration or development of locatable, saleable, and/or leasable minerals be pursued, special stipulations would be included in the mining plan of operations after the results of site-specific EAs for each action are known. Impacts cannot be projected before preparing such assessments, which would include methods, mitigation, and rehabilitation plans to meet the conditions required to protect soil. Therefore, such measures could minimize effects on soils.

Locatable Minerals

Mining itself might disturb soils and potentially result in accelerated erosion and loss of soil productivity. These effects to soils could be mitigated under 43 CFR 3715 and 43 CFR 3809, the regulations that implement the Federal Land

Policy and Management Acts (FLPMA) mandate to prevent unnecessary or undue degradation from the surface disturbance of mining under the Mining Law of 1872.

Saleable Minerals

Extracting mineral materials would result in loss of soils and vegetation cover in mining areas and could lead to increased soil erosion.

Leasable Minerals

Mining that could occur in areas remaining open to leasable minerals development could degrade soils through compaction and increased erosion. From the RFD scenario described for the section of Chapter 4, Impacts on Minerals and Energy Resources, the likely scope of leasable mineral development is small. Therefore, impacts to soil are also likely to be small.

Alternative B

Impacts of minerals management on soil would be similar to those discussed for *Alternative A*.

Alternative C

Impacts to soils in Agua Fria National Monument would be similar to those discussed for *Alternative A*.

In the Bradshaw-Harquahala Planning Area impacts to soil resources from minerals management would be similar to those discussed for *Alternative A*, but the closure of many areas to mineral entry, mineral material disposal, and mineral leasing under *Alternative C* would reduce potential soil disturbance from mining.

Alternative D

In Agua Fria National Monument impacts to soil from minerals management would be similar to those discussed for *Alternative A*.

In the Bradshaw-Harquahala Planning Area impacts to soil resources would be similar to those discussed for *Alternative A*, but the closure of many areas to mineral entry, mineral material disposal, and mineral leasing under *Alternative D* would even further reduce potential soil disturbance from mining.

***Alternative E* (Preferred Alternative)**

In both planning areas soil impacts from mining are expected to be similar to those under *Alternative A*, except that the closure to mineral disposal in ONAs and allocations to maintain or enhance wilderness characteristics would reduce the potential for mining-related soil disturbance.

4.8.11 From Fire Management

***Alternative A* (No Action)**

Where prescribed burning is conducted in Agua Fria National Monument, the use of heavy equipment and mechanical thinning of trees could affect soils, increasing the potential for soil erosion. Soil moisture and productivity could be reduced in the short term, but increased in the long term. Prescribed burning would offer the following benefits:

- increasing vegetation diversity,
- moving vegetation communities in target areas toward a natural desert grassland community, and
- reducing the risk of catastrophic fires.

These benefits would result in more vegetation cover that would reduce soil erosion.

Under the current management of both planning areas, full suppression of wildfires is needed to maintain healthy Sonoran Desert communities, which are highly sensitive to fire. Full suppression in interior chaparral or desert grassland communities, which are fire-adapted vegetation types, would limit the natural beneficial affects of fire, encouraging vegetation type conversions towards higher proportions of

woody species. As a result, herbaceous cover on the soil surface would likely decline with related soil effects, including decreased infiltration and increased runoff and erosion. The use of heavy equipment during suppression could also increase soil disturbance and potentially increase erosion.

***Alternatives B, C, D,* and *E* (Preferred Alternative)**

Impacts are similar to those described in *Alternative A*, except that fire use would be allowed in adapted ecosystems. When lightning fires occur, larger wildfires could be allowed to occur, resulting in short term increases in soil loss. The long term recovery of natural fire adapted vegetation communities that respond rapidly to post fire conditions should make this a very short period.

Management actions of full suppression would continue in Sonoran Desert vegetation communities and in Wildland-Urban Interface (WUI) areas. In these areas, full wildfire suppression would have impacts similar to those described for *Alternative A*.

4.8.12 From Wild Horse and Burro Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

No wild horses or burros inhabit Agua Fria National Monument.

Under the current and alternative management of the Bradshaw-Harquahala Planning Area maintaining herd numbers at current levels in the Lake Pleasant Herd Management Area (HMA) would minimize impacts to soil from wild burros. In the Harquahala HA, removal of nuisance burros and burros from sensitive habitats would improve soil stability and productivity in the Harquahala MU.

4.8.13 From Management of Transportation and Public Access

***Alternative A* (No Action)**

Increasing visitor use and vehicle travel in the area addressed by the Phoenix RMP would intensify soil erosion due to increasing numbers of OHV users and poorly engineered or non-engineered trails and routes. Despite users being confined to existing routes, erosion could increase on OHV trails ascending steep terrain and crossing unstable soils on hillsides. Overall, impacts from OHV use on soils are expected to be less than in other parts of the Bradshaw-Harquahala Planning Area as users are now restricted to using existing routes.

West of Highway 93, increased soil erosion is expected from increased visitation, multiplying numbers of routes, and greater use of OHVs on steep slopes. Bank washes would be broken down and made unstable in wash “play” areas. Soil damage and erosion could result from surface disruption, soil compaction, and damage to soil-holding plants. Soils could be permanently damaged on steep slopes and across loosely graveled gentle slopes. Vehicle tracks on the lands here, especially desert pavement surfaces and hillsides, could last for 60 years or perhaps centuries, from evidence of Native American artwork and tread marks from World War II desert training exercises.

Under the current management of the areas west of Highway 93 and north of Wickenburg, areas of concentrated recreation and OHV use could result in the loss of or reduced vegetation cover, soil compaction, and streambank instability in riparian and wash areas, thus reducing soil moisture and soil productivity.

The lack of OHV-related management facilities and amenities would contribute to increasing damage to soils across the Bradshaw-Harquahala Planning Area. Vegetation and infiltration could decrease, wash bank and riparian area stability would decline throughout the area and increased

amounts of soil would be exposed to erosion and compaction. All new routes would be built in ways intended to minimize soil disturbance, erosion, and compaction.

Alternative B

In Agua Fria National Monument, impacts to soil resources, including increased surface disturbance and erosion, might occur in the Front Country and Passage Zones due to increased transportation and public visitation. In the monument, 38 miles of route would be closed and 5 miles of route would be built. The net reduction of 33 route miles would likely reduce soil disturbance, erosion, and compaction by OHV use. All of the routes that would be closed or opened are located in moderate to very severe potential soil erodibility areas.

In the Bradshaw-Harquahala Planning Area route closures in Tule Creek ACEC and allocations to maintain or enhance wilderness characteristics within the Castle Hot Springs and Harquahala Management Units would slightly reduce soil disturbance, erosion, and compaction by OHV use. Some of these routes are in soil mapping units with moderate potential soil erodibility, but most are in slight potential erodibility.

Alternative C

Impacts on the national monument would be similar to those discussed for *Alternative B.* In the monument, 50 miles of route would be closed and 6 miles of new route would be built. Moreover, this net reduction of 44 miles of route would marginally protect more soil resources than *Alternative B.*

Reducing vehicle travel routes and use in Harquahala Mountains ONA, and the allocations to maintain or enhance wilderness characteristics within the Black Canyon MU, the Hassayampa MU, and the Harquahala MU, would reduce recreation and OHV-related erosion, compaction, and surface disruption of soils. Some of these routes are in soil mapping units with moderate potential erodibility areas, but most are in slight potential erodibility.

Alternative D

Impacts on the national monument would be similar to those discussed in *Alternative C*. In the monument, 122 miles of route would be closed and no new routes would be built. Consequently, this alternative would provide the most protection to soil resources due to route closures.

Soil erosion resulting from vehicular travel would be curtailed by eliminating or mitigating recreation vehicle use in the allocations to maintain or enhance wilderness characteristics within the Black Canyon MU, the Hassayampa MU, and the Harquahala MU.

Restricting vehicle use to designated routes would further reduce soil impacts in all other parts of the planning area. As routes are designated, reclaimed, or reduced in width for non-motorized use, cover vegetation would increase, increasing infiltration and reducing the amount of soil exposed to erosion and compaction.

***Alternative E* (Preferred Alternative)**

Impacts on the national monument would be similar to those discussed for *Alternative C* and *D*, except that 70 miles of route would be closed and one mile of new route built. The net reduction of routes would be 69 miles. This reduction in route mileage would reduce soil disturbance more than *Alternatives B* and *C*, but less than *Alternative D*.

Soil erosion caused by vehicular travel would be curtailed by eliminating vehicle use in Tule Creek ACEC, and by reducing vehicle routes and cross-country travel in allocations to maintain or enhance wilderness characteristics and the Harquahala Mountains and Black Butte ONAs. Curtailing or reducing vehicle use in the above areas would benefit soil resources by eventually reducing the potential for soil

disturbance, compaction, and erosion caused by motorized activities.

4.8.14 From Management of Wilderness Characteristics

***Alternative A* (No Action)**

There are no impacts expected.

Alternative B

For the management of wilderness characteristics 56,040 acres would be allocated. In these areas soil disturbances, compaction, and erosion caused by human induced activities would be reduced.

Alternative C

Impacts would be the same as *Alternative B* except that 107,510 acres would be allocated for the management of wilderness characteristics. Soil disturbance created by these designations would be reduced the most in this alternative.

Alternative D

Impacts would be same as *Alternative B* except that 91,480 acres would be allocated for the management of wilderness characteristics. This alternative would provide more protection than *Alternative B*, but less than *Alternatives C* and *E*.

***Alternative E* (Preferred Alternative)**

Impacts would be the same as *Alternative B* except that 96,420 acres would be allocated for the management of wilderness characteristics. Soil protection as a result of these designations would be more than *Alternatives B* and *D*, but less than *Alternative C.*

4.9 Impacts on Air Quality

Air Quality Impacts from OHVs

Most of the air emissions generated in both planning areas are generated by OHVs. OHV use is an important recreation activity for residents of Maricopa and Yavapai Counties. On a countywide basis, OHVs generate much fugitive dust and tailpipe emissions.

Table 4-1 shows estimated current countywide emission rates for fugitive dust and nitrogen oxides (NOx) generated by countywide OHV use in the two counties. Table 4-1 also compares the OHV emission rates to the regional emissions generated inside the densely populated Phoenix nonattainment areas. Although no estimates were made to apportion OHV use in both planning areas, only a fraction of the countywide use listed in Table 4-1is likely to affect the planning areas. Countywide emissions generated by OHVs are only a small fraction of the overall regional emissions, and most of the countywide OHV use occurs in remote rural areas. Therefore, one can reasonably conclude that OHVs cause elevated air pollutant concentrations immediately near the routes on which they operate but that OHVs are unlikely to contribute to any meaningful regional air quality impacts that would affect the Phoenix nonattainment area or sensitive areas downwind of Phoenix.

Note that the current countywide OHV emission rates shown in Table 4-1 might increase in the future. The population of both Maricopa and Yavapai Counties are forecast to increase dramatically, and historical per-capita OHV use has increased faster than the rate of population growth. Thus, future emissions of fugitive dust would likely be higher than the current rates listed in Table 4-1. But recently enacted Federal emission limits for OHVs would ensure that the tailpipe emissions from individual OHVs would decrease in the future. Therefore, countywide nitrogen oxides emissions from OHVs could decrease in the future if the emission reductions from individual OHVs more than offset the increase in the number of OHVs operating.

General Conformity Regulatory Requirements

Each of the Alternatives specifies a different set of parcels that would be suitable for land disposal. Land disposal in the Bradshaw-Harquahala Planning Area is a Federal action that is subject to the Federal General Conformity air quality regulations, if the land disposal triggers induced population growth that would increase regional air emissions in the Phoenix nonattainment areas for ozone and PM_{10}. If the General Conformity rule applies, BLM is required to implement one of the following actions:

- Through discussions with the Maricopa Association of Governments (MAG) and the Arizona Department of Environmental Quality (ADEQ), confirm that MAG has already accounted for population growth and emissions from the land disposal parcels inside the nonattainment area and that MAG has included those emissions in its nonattainment area plans that are periodically submitted to Environmental Protection Agency (EPA) for approval.
- If induced growth emissions from the disposal parcels have not been included in the MAG Nonattainment Area Plans, BLM must implement emission offsets for the entire induced emissions from parcels inside the nonattainment areas.

Forecast Land Disposal Population Growth and Emissions

Table 4-2 lists the Year 2025 population and air pollutant emissions that would be generated by land disposal parcels in the ozone and PM_{10} nonattainment areas. The table assumes that

Table 4-1. Estimated Emissions from Countywide OHV Use

County	Annual OHV Trips	PM^{10} Emissions		Nitrogen Oxides (NO_x) Emissions	
		Emission Factor (lbs/trip)	Annual Countywide Emissions (tons/yr)	Emission Factor (lbs/trip)	Annual Countywide Emissions (tons/yr)
Maricopa	2,087,000(1)	4(3)	4,200	0.14(4)	146
Yavapai	1,195,000(2)	4(3)	2,400	0.14(4)	84
Total Emissions From All Sources In Phoenix Nonattainment Areas		Total PM^{10} Emissions (Year 2001)	79,500(5)	Total NO_x Emissions (Year 1999)	81,000(6)

Example calculation (NOx emissions within Maricopa County)
NO_x emission factor = 0.14 lbs per 25-mile ORV trip
Maricopa County ORV usage = 2,087,000 trips/year
Annual NO_x emissions = (2,087,000 trips/year) x (0.14 lbs/trip) / (2000 lbs/ton) = 146 tons per year of NO_x

Data Sources:

(1) Arizona State Parks, 2003

(2) Arizona State Parks, 2003

(3) Emission factor from Imperial Sand Dunes Recreation Area EIS (BLM 2003), assuming 25 miles per OHV trip

(4) NO_x emission factor from Imperial Sand Dunes Recreation Area EIS (BLM 2003)

(5) Maricopa Association of Governments (MAG) 2000

(6) MAG 2002

each parcel would be developed to a residential density based on that parcel's Regional Analysis Zone (RAZ) designation. For perspective, the table compares emissions from the land disposal parcels with the overall emissions from the entire nonattainment area.

Note that Table 4-2 lists air emissions only in the Phoenix nonattainment area. More population growth and emission increases would occur outside the nonattainment areas. As described later in this section, emission increases outside the nonattainment area have been accounted for in MAG air quality analyses.

It is not clear whether residential development of BLM land disposal parcels represents "induced growth" subject to General Conformity. The air quality agencies (MAG, ADEQ, and EPA) are aware of the upcoming land developments, and they have already accounted for the population growth in their air quality plans to improve regional air quality. BLM consulted with MAG and confirmed that MAG has already accounted for population growth and emissions from BLM's land disposal parcels within and outside the nonattainment area. MAG assumes that each BLM parcel would become fully developed according to the same time schedule and residential density as all other marketable parcels in the respective RAZ. MAG then estimates the residential emissions from all parcels (including BLM's) and uses the emissions to model air quality concentrations. The emission estimates and air quality modeling have been included in MAG's most recent nonattainment and maintenance plans.

Estimated emissions from population and transportation for the combined land disposal parcels inside the nonattainment areas exceed the General Conformity applicability thresholds: 50 tons/year of NO_x; and 70 tons/year of PM_{10}. Thus, if one assumes that the population residing on the land disposal parcels is “induced growth,” BLM's land disposal for each Alternative requires a General Conformity analysis. The required analysis is presented below.

General Conformity Analysis: Air Quality Impacts of Land Disposal

As described previously, land disposal would allow residential development on now-rural parcels, thereby contributing to regional population growth and regional air pollutant emissions. BLM's land disposal actions might be determined to trigger Federal General Conformity air quality requirements. In any case BLM's actions satisfy the General Conformity requirements for the following reasons:

- MAG and ADEQ have already accounted for full residential development of BLM's parcels within and outside the nonattainment areas. The population, vehicle travel, and emissions from each BLM parcel have been assumed to increase under the same schedule and intensity as the neighboring parcels.
- The future increases of emissions from BLM parcels inside the nonattainment areas have been directly accounted for. The emissions from each one-acre gridded parcel have been included in MAG's periodic emission inventories and air quality modeling used to show future improvements in ambient concentrations as part of the nonattainment plans and maintenance plans approved by EPA.
- Future emission increases for parcels outside the nonattainment area have been indirectly accounted for. MAG models emissions from all parcels inside the nonattainment by synthesizing each parcel into composite one-acre grid cells for input to the air quality computer model. Emissions from residential areas outside the nonattainment area are indirectly included in the computer modeling by specifying “boundary condition” (i.e. upwind) ambient concentrations at the nonattainment area boundary. As a worst-case assumption, MAG assumes that these upwind concentrations would remain constant in the future. In reality, the upwind

concentrations are likely to decrease in the future because major improvements in tailpipe emissions from off-road vehicles (ORV) and non-road engines would more than offset forecast population growth.

- The predictive modeling in MAG's nonattainment plans and maintenance plans showed that air quality in the nonattainment area can be improved by implementing EPA-approved air quality regulations. The air quality control measures approved by EPA include the following:
    - PM_{10} emission reductions can be achieved by tightening controls on construction, by paving roads and parking areas, and by enhancing street sweeping.
    - Emission reductions for ozone precursors emitted by off-road vehicles can be achieved mainly by encouraging the public to continue to replace their existing cars with new, cleaner vehicles. MAG would be required to continue to operate its Enhanced Inspection/Maintenance program for passenger cars to demonstrate the expected ongoing improvements do, in fact, occur.
    - Emission reductions from stationary industrial sources would be achieved by implementing new, more stringent, regulations on volatile organic compound emissions.

From the above analysis, one can conclude that BLM's land disposal actions satisfy the General Conformity Regulation. New residential development on previously rural BLM's land would have a minor effect on air quality immediately downwind from each new development. The ambient concentrations near each residential development would be less than allowable State and Federal limits. MAG's air quality modeling shows that regional air quality would continue to improve even after accounting for future population growth.

Air Quality Issues of Utility Corridors

Each of the Alternatives specifies a different set of utility access corridors, related mainly to the width of each corridor. At this time none of the utilities have filed permits to build new pipelines or transmissions lines through any of the available corridors. If new utilities were permitted in the future and were built in the narrower corridor, then building and maintaining the new utility would generate temporary, localized fugitive dust impacts immediately nearby. In those cases, EAs or, as suitable, Environmental Impact Statements (EISs) would be required for each new utility. The EA or EIS for each action would specify required fugitive dust controls. Any construction in nonattainment areas would have to comply with county dust control requirements. Typical dust control measures include the following:

- watering unpaved roads and staging areas,
- prohibiting work during high winds,
- covering or watering temporary stockpiles,
- washing trucks entering public streets from construction zones,
- sweeping paved areas, including public streets, and
- promptly revegetating disturbed areas.

4.9.1 From Special Area Designations

***Alternative A* (No Action)**

Most special area designations specify limiting, curtailing or mitigating land use development and OHV use. Restrictions resulting from special area designations are likely to increase emissions in the future because of forecast regional population growth and increases in regional OHV use.

Under its current management, two areas in Agua Fria National Monument have special area designations: Larry Canyon ACEC (80 acres) and Perry Mesa ACEC (9,580 acres). Larry Canyon ACEC would continue to be closed to motorized vehicles under *Alternative A*. Motorized vehicles in Perry Mesa ACEC are limited to designated roads and trails. Since Larry Canyon ACEC is inaccessible to vehicles, fugitive dust and emissions do not occur there. Restricting motorized vehicles to designated roads and trails in Perry Mesa ACEC would allow the continued generating of fugitive dust and tailpipe emissions.

Emissions from OHV use at the RCA and two MRMAs, would likely increase as a result of regional population growth and increased regional OHV use. OHV emissions might cause localized, temporary air quality impacts along the roads and trails, but would be likely to contribute little to regional air quality impacts when compared to the much larger emissions generated by the densely populated Phoenix metropolitan area.

Under the current management of the Bradshaw-Harquahala Planning Area BLM would continue to prohibit OHV use in five wilderness areas (96,820 acres) and encourage OHV use on one back country byway (Harquahala Mountain Summit Road).

Increased visitor use travel along the 10.5 mile Harquahala Mountain Summit Road Back Country Byway would increase fugitive dust in the immediate area of Blue Tank Wash and the Harquahala Mountains Wilderness, but this increase is not considered of more than local significance. Motorized vehicles are prohibited in wilderness areas and so designation of wilderness areas would not contribute to air emissions.

Alternative B

Site-specific recreation prescription in ACECs, RNAs and SRMAs would likely shift OHV users away from these areas to sites where OHV recreation is allowed and intensify vehicle travel and OHV use in the remaining accessible areas long designated routes. The result would be (1) reduced localized air quality impacts in the new restricted areas and (2) increased temporary and localized, degraded air quality in the remaining OHV areas.

Alternative C

The existing Harquahala Mountain Summit Road Back Country Byway, designating the Constellation Mine Road and Bloody Basin Roads as back country byways and later use of these roadways could attract more regional OHV users, drawing them away from other OHV areas. This shift in location is not expected to increase regional OHV use or regional fugitive dust emissions. The shift would concentrate more emissions onto each byway, thereby increasing localized air quality impacts.

In the Bradshaw-Harquahala Planning Area, BLM would designate seven ACECs, further shifting OHV use and possible air quality impacts.

Reducing vehicle travel routes and use in Harquahala Mountains ONA would reduce fugitive dust emissions in the immediate area of these land use designations.

Alternative D

Impacts from designating either new ACECs would be similar to *Alternative B*. The relative shift in air quality impacts between newly restricted areas and the remaining accessible areas would be greatest under *Alternative D* because it would apply new restrictions on the most land.

Air quality effects and fugitive dust emissions from vehicular travel and OHV use would be curtailed by eliminating or mitigating recreation vehicle use in the Sheep Mountain RNA.

***Alternative E* (Preferred Alternative)**

Site-Specific prescriptions and restrictions applied on ACECs (including ONAs), along with cultural and wildlife management prescriptions, would shift the locations of increases in OHV use and resulting fugitive dust and emissions. These actions would probably not affect the total future amounts of either OHV use or fugitive dust emissions throughout Agua Fria National Monument or the Bradshaw-Harquahala Planning Area.

4.9.2 From Lands and Realty Management

***Alternative A* (No Action)**

Most of the air quality issues from Lands and Realty Management are related to population growth and emissions involving land disposal, as described previously in section 4.9. From these sections one can conclude that BLM's actions satisfy all General Conformity requirements and that land disposal actions would not delay the region's compliance with the air quality standards.

New residential development on previously rural BLM's land would have a minor effect on air quality immediately downwind from each new development. The ambient concentrations near each residential development would be less than allowable State and Federal limits. MAG's air quality modeling shows that regional air quality would continue to improve even after accounting for future population growth.

Impacts on air quality would occur in two distinct phases and intensities. The first construction (or reconstruction) phase would contribute to elevated levels of criteria pollutants and fugitive dust, but generally over a limited area and only for short periods. Longer term impacts would result from continuing maintenance operations but generally at a much lower level of production of pollutants. All utility construction proposals would be subject to air quality restrictions (e.g. fugitive dust best management practices), procedures, and stipulations defined in site-specific environmental analysis of the project.

Air Quality Issues of Utility Corridors

Existing utility rights-of-way in the monument would be modified, removed, or maintained in accordance with BLM's agreements with utility providers for as long as the demand exists for the utility. Within the Bradshaw-Harquahala Planning Area, all major utilities would be routed through designated corridors. If new utilities were permitted in the future, then building and maintaining the new utility would generate temporary, localized fugitive dust impacts immediately nearby which would require mitigation. Implementing available dust control best management practices would ensure that any air quality impacts would be temporary and would be limited to the immediate area of the construction.

Air Quality Impacts Caused by Ongoing Maintenance

Under the current management of both planning areas ongoing maintenance and improvement of facilities and roadways would require continued use of construction equipment. This use would continue and could generate fugitive dust and tailpipe emissions by earthmoving and the use of heavy equipment. Each construction or maintenance action would cause a temporary, localized increase in ambient pollutant concentrations for the duration of the activity.

Alternative B

Alternative B would narrow the existing utility corridor in Agua Fria National Monument. This change is not expected to alter existing utility maintenance in the corridor and new utility construction could be permitted, subject to air quality procedures and stipulations defined in site-specific environmental analysis of the project. Thus, narrowing the existing utility corridor is not expected to affect air quality, but it would shift the location of future air quality emissions into a smaller area.

In the Bradshaw-Harquahala Planning Area new utility corridors would be designated for future expected demands. These designations would respond to the demand for the intensification of the power grid and would be consistent with the utility regulations of the Arizona Corporation Commission. Designating new utility corridors and widening the Black Canyon corridor for utility development might result in new pipelines or transmission lines being built through the area. Any such construction would likely generate fugitive dust and tailpipe emissions through earthmoving and the use of heavy equipment.

Impacts from ongoing maintenance and improvement of facilities and roadways would be the same as *Alternative A.*

Alternative C

Under *Alternative C* the Black Canyon utility corridor would be eliminated from Agua Fria National Monument. This action would maintain current emissions of criteria pollutants and fugitive dust. Though the utility corridor would be eliminated, BLM would continue to authorize existing utilities. Air quality impacts from ongoing maintenance would be the same as *Alternative A.*

In the Bradshaw-Harquahala Planning Area impacts would be the same as *Alternative B.*

Right-of-way applications in corridors would precipitate site-specific environmental analysis that would address air quality and actions to minimize impacts. Any construction in nonattainment areas would be subject to comply with county air quality rules.

Alternative D

Impacts in Agua Fria National Monument would be similar to those described for *Alternative C.*

In the Bradshaw-Harquahala Planning Area no new electric and gas corridors would be designated. The portion of the Black Canyon Multi-Use corridor would be extended so that it would be continuous north and south on BLM's land. If utilities elect to use this corridor in the future, they would generate criteria pollutants and fugitive dust through earthmoving and the use of heavy equipment. All utility construction in the planning area would be subject to air quality restrictions, procedures, and stipulations defined in site-specific environmental analysis for the project.

***Alternative E* (Preferred Alternative)**

Impacts under *Alternative E* would be similar to those described for *Alternative C.*

4.9.3 From Management of Soil, Air, and Water Resources

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

Under the current management of both planning areas, soil, water, and air management would promote soils and ground cover and implement preventive erosion measures. This approach would reduce localized emissions of naturally occurring windblown fugitive dust.

4.9.4 From Biological Resource Management

***Alternative A* (No Action)**

In the Agua Fria National Monument, continued measures to protect biological resources, including the use of prescribed fire and mechanical vegetation treatment, may result in small amounts of temporary, localized emissions as discussed in section 4.9.11.

In the Bradshaw-Harquahala Planning Area, continued measures to protect ground cover, biological areas, and habitats would minimize emissions of criteria pollutants and windblown fugitive dust. Implementation of Land Health

Standards is expected to result in progressive increases in ground cover, which would result in reduced production of windblown fugitive dust not related to roads. In addition, measures designed to improve wildlife habitat would limit disturbance from building construction, land clearing, removal of downed wood, or woodcutting, which would also reduce emissions of criteria pollutants.

Alternative B

Impacts would be similar to those under *Alternative A*.

Alternative C

In Agua Fria National Monument two new WHAs would be allocated for enhancing pronghorn habitat. Four new ACECs would be designated for managing biological resources. This action would limit vehicle routes and prohibit new recreational site developments in pronghorn movement corridors, improving air quality in the newly designated areas. However, emissions might increase in the remaining areas where OHV use and recreational site developments are allowed.

The use of prescribed fire to improve habitat for pronghorn would have the same impacts as those discussed for *Alternative A*.

In the Bradshaw-Harquahala Planning Area BLM would designate seven ACECs. This would increase the acreage under strict management for motorized recreation and result in fewer cultural resource areas devoted to intensive public use. Localized air quality impacts would be reduced in the newly restricted areas while increasing the temporary, localized air quality impacts at the remaining OHV and public use areas.

Alternative D

In Agua Fria National Monument two wildlife habitat areas and one ACEC would be designated for managing biological resources. Motor vehicle routes that fragment pronghorn habitat and cross known pronghorn movement corridors would be closed, limited, or mitigated.

Alternative D would redesignate the most land subject to OHV restrictions. The impacts of this action would be similar to *Alternative C*, except that the relative shift in air quality impacts between newly restricted areas and the remaining accessible areas would be greatest under *Alternative D.*

All fences in the national monument would be removed. Removing fences would generate small amounts of localized, temporary emissions of criteria pollutants and fugitive dust.

The use of prescribed fire would have the same impacts as those discussed for *Alternative A*.

In the Bradshaw-Harquahala Planning Area impacts would be similar to those under *Alternative A*.

***Alternative E* (Preferred Alternative)**

Air quality impacts under *Alternative E* would be similar to those under *Alternative C*.

4.9.5 From Cultural Resource Management

***Alternative A* (No Action)**

There no impacts on air quality expected from existing Cultural Resource Management (CRM) in either planning area.

Alternative B

In both planning areas developing access, interpretive facilities, and interpretive media at selected sites would result in more vehicle trips as visitors access these areas. Five sites in the Agua Fria National Monument would be developed for high public use standards, which allows for the building of parking areas. Eight areas in the Bradshaw-Harquahala Planning Area would be managed as SCRMAs with sites

developed for public visitation. The result would be increased emissions of criteria pollutants and fugitive dust.

Alternative C

In Agua Fria National Monument impacts would be similar to those discussed for *Alternative B*. However, impacts would be of lower magnitude because only one site would be developed to High public use standards and nine sites would be developed to Moderate public use standards.

In the Bradshaw-Harquahala Planning Area impacts would be similar to those discussed for *Alternative B,* except the impacts would be of lower magnitude because only four areas would be managed as SCRMAs.

Alternative D

In Agua Fria National Monument only the Pueblo la Plata site complex would be developed for public visitation. Air quality impacts from vehicle traffic would be limited to Bloody Basin Road and the Pueblo la Plata area. Therefore, the levels of airborne pollutants under *Alternative D* would be lower than under *Alternatives B* or *C*.

In the Bradshaw-Harquahala Planning Area levels of pollutants generated by site visits would be lower than under *Alternatives B* or *C* because only two areas would be managed as SCRMAs with sites developed for public visitation.

***Alternative E* (Preferred Alternative)**

In Agua Fria National Monument two sites would be developed for public visitation under High public use actions, and six sites would be developed in accordance with Moderate public use management actions. The projected impacts on air quality would be lower than expected under *Alternative B* and greater than expected under *Alternatives C* and *D.*

In the Bradshaw-Harquahala Planning Area six areas would be managed as SCRMAs with sites developed for public visitation. The projected impacts on air quality would likely be lower than expected under *Alternative B* and greater than expected under *Alternatives C* and *D.*

4.9.6 From Paleontological Resource Management

Alternatives A (No Action), B, C, D,* and *E (Preferred Alternative)

There are no impacts to air quality expected as a result of paleontological resource management in either planning area.

4.9.7 From Recreation Management

Each of the Alternatives would impose new restrictions on motorized recreation in portions of the planning areas. These restrictions would shift OHV users away from the newly restricted areas but might increase OHV uses in the remaining areas. Adverse air quality impacts would be reduced in the newly restricted areas, but there could be temporary, localized increases in emissions in the remaining areas accessible to OHVs.

***Alternative A* (No Action)**

Prohibiting cross-country OHV use in Agua Fria National Monument would reduce levels of criteria pollutants and fugitive dust. In the Bradshaw-Harquahala Planning Area OHV travel would generate increased emissions of criteria pollutants and fugitive dust.

The current recreation uses (hiking, target shooting, viewing prehistoric sites, and dispersed camping with a 14-day limit) could generate emissions of criteria pollutants and fugitive dust from OHV travel, as well as emissions and smoke from campfires and stoves. Over time, as these uses continue to increase, so will the emission of criteria

pollutants associated with them. Under *Alternative A*, an unlimited number of competitive races could be authorized between October 15 and March 31, and in areas currently not used for such activities. This increased activity would potentially increase the amount of fugitive dust. However, all proposed races will be required to comply with county air quality standards thereby significantly reducing the potential for any noticeable increase of airborne emissions.

Areas open to camping would generate criteria pollutants and fugitive dust from OHV travel, as well as small amounts of emissions and smoke from campfires and stoves. The use of roadways and trails by motor vehicles would result in tailpipe emissions and fugitive dust from vehicular travel. Building and maintaining recreation-related roadways, trails, and facilities would generate temporary and short-lived emissions of criteria pollutants and fugitive dust from heavy equipment and earthmoving.

Alternative B

In Agua Fria National Monument emphasis in the Back Country RMZ would be on managing and maintaining the character of the natural landscape. In the Front Country RMZ, more focus could be placed on recreation and interpretation. OHV use in the portions of the national monument accessible to OHVs would generate emissions of criteria pollutants and fugitive dust.

Site-specific recreation prescriptions in ACECs, ONAs, RNAs, SRMAs, allocations to maintain or enhance wilderness characteristics, RMZs, and other allocations would likely shift OHV users away from these areas to areas where OHV recreation is allowed and intensify vehicle travel and OHV use in the remaining accessible areas along designated routes. The result would be (1) reduced localized air quality impacts in the newly restricted areas and (2) increased temporary and localized, degraded air quality in the remaining OHV areas.

Thus, new and displaced OHV users would increase criteria pollutants and fugitive dust concentrations in and immediately near designated routes. The number of competitive races would be limited to 14 which is significantly higher than current conditions. However emissions of particulate matter are not expected to be considerable due to mitigation measures placed on these races to comply with county air quality standards. In addition, countywide OHV emissions are only a small fraction of the total emissions generated by the Phoenix metropolitan area. They are unlikely to contribute any regional air quality impacts that would affect the metropolitan area or any sensitive areas downwind of Phoenix.

Emissions of criteria pollutants and fugitive dust in the planning areas would be reduced in some areas by route closures or restrictions. In the Bradshaw-Harquahala Planning Area net dirt roads would be reduced by 82 miles, and there would be 24 fewer miles of dirt road in Agua Fria National Monument. These route closures would likely reduce fugitive dust emissions in the immediate area along the routes. Regionally, these closures would not decrease vehicle use or emissions and fugitive dust.

Building and maintaining roadways, trails, and recreation facilities would generate temporary and short-lived emissions of criteria pollutants and fugitive dust from heavy equipment and earthmoving. BLM's development activities would comply with local and county dust control ordinances to limit emissions and fugitive dust.

Alternative C

In Agua Fria National Monument impacts from recreation on air quality would be similar to *Alternative B*, except that more vehicle routes would be closed or limited to motorized vehicles.

In the Bradshaw-Harquahala Planning Area, impacts of OHV use would be similar to *Alternative B*, except BLM would designate seven ACECs, further shifting OHV use and possible air quality impacts.

Alternative C would implement well-planned, sited, and managed SRMAs and address intensive recreation and OHV use and vehicle route designations at Table Mesa, the Hieroglyphic Mountains, Stanton, Wickenburg, San Domingo Wash, and Vulture Mine locales. The SRMAs would reduce air quality effects and fugitive dust emitted by improper activity, scheduled OHV events, and intensive OHV use. The number of competitive races would be limited to 6 per year which is slightly higher than current conditions. Air quality emissions from these activities would remain the same or lessen over time due to management actions.

Alternative D

Vehicular access would be limited under *Alternative D*, and a Back Country RMZ would be established throughout most of Agua Fria National Monument to preserve natural landscapes. Most Cultural Resource Management areas would be designated for limited public use. No other areas for intensive public use would be developed to replace the areas that would become restricted. Larger areas would be managed for more primitive recreation. This approach is not expected to reduce overall regional emissions, but it would (1) shift air quality impacts away from newly restricted areas and (2) intensify localized air quality impacts in the remaining areas where OHV recreation remains accessible. The relative shift in air quality impacts between newly restricted areas and the remaining accessible areas would be greatest under *Alternative D* because it would apply new restrictions on the most land.

In Agua Fria National Monument BLM would issue no SRPs. The decrease in visitors to the area from reduced recreation would lead to fewer vehicle trips, which would decrease emissions of criteria pollutants. Camping would generate criteria pollutants and fugitive dust from OHV travel, as well as small amounts of emissions and smoke from campfires and stoves. Building and maintaining roadways, trails, and facilities would generate emissions of criteria pollutants and fugitive dust from heavy equipment and earthmoving.

In the Bradshaw-Harquahala Planning Area new restrictions on OHV use would be enacted on more land under *Alternative D* than under any of the other Alternatives.

In the Bradshaw-Harquahala Planning Area 1,108 miles of routes would be closed. The route closures would reduce opportunities for air quality emissions and fugitive dust. Phasing out the use of the Hieroglyphic Mountains SRMA for OHV use would improve air quality and lessen dust emissions by eventually reducing and ending motorized activities on 16,510 acres.

Alternative D would implement well-planned, sited, and managed SRMAs addressing intensive recreation and OHV use and vehicle route designation at Table Mesa, the Hieroglyphic Mountains, Stanton, Wickenburg, San Domingo Wash, and the Vulture Mine areas. The result would be reduced air quality effects and fugitive dust emitted by improper activity, scheduled OHV events, and intensive OHV use. Under this alternative, no competitive races would be allowed. Therefore, air quality emissions from these activities would be expected to be reduced over time due to management actions.

***Alternative E* (Preferred Alternative)**

Impacts of site-specific prescriptions and restrictions within the Agua Fria National Monument and the Bradshaw-Harquahala Planning Area would be similar to *Alternative C.*

The impacts of SRMAs would be similar to *Alternative C*

The number of competitive races in this alternative would be limited to eight. Air quality effects and fugitive dust emissions would be negligible due to mitigation measures placed on these races to comply with county air quality standards. Therefore, air quality emissions from these activities would remain the same or be reduced over time due to management actions.

4.9.8 From Visual Resource Management

***Alternative A* (No Action)**

No policy standards are now directed toward visual resources.

***Alternatives B, C, D,* and *E* (Preferred Alternative)**

The managing of areas under Class I, II, and III standards could contribute to restrictions on some kinds of land development and use. The overall regional levels of construction-related pollutants and fugitive dust would be reduced if projects are modified or prohibited to satisfy VRM objectives.

4.9.9 From Rangeland Management

***Alternative A* (No Action)**

Under current grazing management, proper grazing practices should maintain adequate vegetation cover to keep windblown dust levels to near natural conditions. In areas of livestock concentration, such as around waters, salt grounds, and corrals, greatly reduced vegetation cover would increase potential windblown dust emissions. The affect of this windblown dust is generally localized near the source. Implementing the *Standards for Rangeland Health* (Land Health Standards) and the *Guidelines for Grazing Management* (Rangeland Management) would allow regular evaluation of grazing practices and remediation of problems that might lead to reduced air quality.

Alternatives B

Air quality impacts of *Alternative B* would be similar to those described for *Alternative A*, except that winter-only grazing of riparian areas would lead to higher vegetation densities in those areas. These higher densities would slightly reduce the potential for windblown dust.

Alternative C

Impacts of *Alternative C* would be similar to those under *Alternative B*, except that higher vegetation densities in riparian areas would be achieved more quickly with no grazing than with winter-only grazing.

Alternative D

In both planning areas existing livestock grazing allotments would be closed and any current livestock authorizations would be cancelled for the duration of the plan. This approach would decrease the amount of fugitive dust generated by livestock removing forage and ground litter. In addition, places livestock concentrate would slowly revegetate, reducing dust emissions even more.

***Alternative E* (Preferred Alternative)**

Impacts would be the same as those described for *Alternative B*.

4.9.10 From Minerals Management

***Alternative A* (No Action)**

There are no impacts expected in Agua Fria National Monument.

In the Bradshaw-Harquahala Planning Area locatable, saleable, and leasable mineral development could create short-term and periodic increased emissions of criteria pollutants and fugitive dust from construction, vehicular traffic, and other activities. Federal mineral rights on scattered lands that are outside the planning area and designated open to location, entry, and patenting could create short-term and periodic increased emissions of criteria pollutants and fugitive dust from construction, vehicular traffic, and other activities. In areas that would remain open to mineral exploration and development continued mining would result in long-term increases in emissions. However, these increases would likely be localized and are

subject to Federal and State emission regulations designed to mitigate impacts to air quality. For facilities in nonattainment areas, such regulations could result in off-sets or other facility-specific mitigation that would reduce air quality impacts.

Each of the Alternatives specifies a different set of areas where mining would or would not be allowed. From the Reasonable Foreseeable Development Scenarios described for section 4.17, one can estimate the following mineral development:

- 2 oil and gas exploratory wells, which could disturb as much as 20 acres;
- 60 to 100 small locatable mines and 1 or 2 large mines, which could disturb 1400 to 2400 acres;
- as many as 20 saleable mineral pits, which could disturb as much as 800 acres, over the next 20 years.

Air quality impacts from such mining would be mainly fugitive dust from equipment at the mine site, in addition to dust and exhaust from haul trucks. Any mining in the PM_{10} nonattainment area would have to comply with Maricopa County dust abatement and air quality rules. The impact of these operations would be mainly local (within 1/2 mile of the mine and haul road) and would contribute to the PM_{10} particulate count in the nonattainment area.

Alternatives B* and *C

In the Bradshaw-Harquahala Planning Area impacts would be the same as those discussed for *Alternative A*.

Alternative D

In the Bradshaw-Harquahala Planning Area reconveyed lands would be closed per public land order. *Alternative D* would also reduce the amount of land open to location, entry, and patent of locatable, saleable, and leasable minerals. This action would reduce emissions of criteria pollutants and fugitive dust.

***Alternative E* (Preferred Alternative)**

Impacts of *Alternative E* would be similar to those described for *Alternative A*.

4.9.11 From Fire Management

***Alternative A* (No Action)**

The use of prescribed fire and mechanical vegetation treatment in the Agua Fria National Monument would result in short-term, localized episodes of smoke and reduced visibility. Burning prescriptions account for smoke and contain smoke management plans. These plans require burning conditions that encourage rapid smoke dispersal and discourage smoke drift into either highly populated areas or ADEQ Class I or II airsheds. ADEQ would continue to require that BLM obtain prescribed burning approvals before each event to ensure that prescribed burns are conducted only during favorable weather to reduce air quality impacts. In this way, air quality impacts from prescribed burning are minimized.

When wildfires strike wilderness areas, suppression strategies are selected on a case-by-case basis in considering fire control opportunities, environmental impacts, and risks to public health and safety. Smoke might degrade local and regional air quality during these wildfires. The degree of smoke production and air quality impact depends on the suppression approach employed and the weather at the time of the fire.

Wildfires both on and off the national monument would also increase levels of smoke and reduce visibility during the fire. Weather conditions might cause high smoke columns and smoke drift into both high population areas and over ADEQ Class I and II airsheds. In most years, these events are of short duration (1 week or less) but might persist for longer periods. Multiple fire incidents, either simultaneously or sequentially, could increase the effects from smoke, or could increase the duration of the

smoke impact. Typically, the fire season is from April through July. The use of heavy equipment and the mechanical thinning of trees would generate small amounts of temporary, localized emissions of fugitive dust and tailpipe exhaust.

***Alternatives B, C, D,* and *E* (Preferred Alternative)**

Air quality impacts would be the same as described for *Alternative A*, except that naturally occurring wildfires could be managed to meet resource objectives in fire adapted ecosystems if conditions are favorable. Smoke management would be a consideration in making the decision to manage a wildfire, similar to the process applied for prescribed fires. The opportunity for smoke drift into populated areas and/or Class I or II airsheds would be increased over that described for *Alternative A*.

4.9.12 From Wild Horse and Burro Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

There are no impacts expected.

4.9.13 From Management of Transportation and Public Access

***Alternative A* (No Action)**

Prohibiting cross-country OHV would reduce levels of criteria pollutants and fugitive dust. In the Bradshaw-Harquahala Planning Area OHV travel would generate increased emissions of criteria pollutants and fugitive dust.

Any potential opening of new routes would increase fugitive dust during construction as well as increase emissions created by vehicles once the route is opened.

Alternative B

The net amount of roads closed or opened in the Agua Fria National Monument could have impacts on emissions and fugitive dust. In Agua Fria National Monument 140 miles of route would be left open and 33 net miles of route would be closed. Route closures could reduce fugitive dust created by construction as well as reduce emission of vehicles that used the route.

In the Bradshaw-Harquahala Planning Area net dirt roads would be reduced by 82 miles, and there would be 24 fewer miles of dirt road in Agua Fria National Monument. These route closures would likely reduce fugitive dust emissions in the immediate area along the routes. Regionally, these closures would not decrease vehicle use or emissions and fugitive dust. Route closures would concentrate more vehicles on remaining roads and thereby increase localized air quality impacts and fugitive dust levels.

Building and maintaining roadways, trails, and recreation facilities would generate temporary and short-lived emissions of criteria pollutants and fugitive dust from heavy equipment and earthmoving. BLM development activities would comply with local and county dust control ordinances to limit emissions and fugitive dust.

Alternative C

In Agua Fria National Monument, impacts on air quality would be similar to *Alternative B*, except that more vehicle routes would be closed or limited to motorized vehicles (44 miles).

In the Bradshaw-Harquahala Planning Area, impacts of OHV use would be similar to *Alternative B* except BLM would designate seven ACECs, further shifting OHV use and possible air quality impacts.

Alternative D

In Agua Fria National Monument, negative impacts to air quality would be the least due to the highest amount of route closures over other Alternatives (122 miles).

In the Bradshaw-Harquahala Planning Area 1,108 miles of routes would be closed. The route closures would reduce opportunities for air quality emissions and fugitive dust.

***Alternative E* (Preferred Alternative)**

In the Agua Fria National Monument, impacts would be the same as *Alternative B*, except that more net route miles would be closed (70 miles).

Impacts in the Bradshaw Harquahala Planning Area would be similar to those described under *Alternative B*.

4.9.14 From Management of Wilderness Characteristics

***Alternative A* (No Action)**

There are no impacts expected.

Alternative B

Under this Alternative, 56,040 acres would be allocated to the management of wilderness characteristics. Allocations to manage wilderness characteristics, which would limit or restrict vehicle use, could intensity vehicle travel to remaining accessible areas resulting in reduced localized air quality impacts in newly restricted sites and increased temporary and localized, degraded air quality in other areas.

Alternative C

Impacts would be the same as described in *Alternative B*, except that more area would be allocated to the management of wilderness characteristics (107,510 acres).

Alternative D

Impacts would be the same as described in *Alternative B,* except that more area would be allocated to the management of wilderness characteristics (91,480 acres), but less area would be allocated than in *Alternative C*.

***Alternative E* (Preferred Alternative)**

Impacts would be the same as described in *Alternative B* except that more area would be allocated to the management of wilderness characteristics (96,420 acres), but less area would be allocated than in *Alternative C* and more than in *Alternative D*.

4.10 Impacts on Water Resources

Impacts to water resources include effects on watershed resources such as soils, groundwater, vegetation cover, and surface water quality and quantity. These factors contribute to the riparian functional condition. Riparian system proper functioning condition, as defined in BLM's Riparian-Wetland initiative, is also included. The functioning condition of riparian-wetland areas is a result of interaction among geology, soil, water, and vegetation. Riparian-wetland areas are in proper functioning condition under the following conditions:

- Adequate vegetation, landform, or large woody debris is present to dissipate stream energy from high water flows, thereby reducing erosion and improving water quality.
- Sediments are filtered, bed-load is captured, and floodplains develop.
- Flood water retention and groundwater recharge are improved, root masses that stabilize streambanks against cutting action develop; and diverse ponding and channel characteristics are created to provide the habitat and the water depth, duration, and temperature needed for fish production, waterfowl breeding, and other uses.
- Greater biodiversity is supported.

This analysis focuses on management actions that could change the hydrologic functions of the

planning areas. The functions of most concern are soil compaction and vegetation removal, which lead to increased runoff, erosion, and later sediment deposition downslope or into a stream. Please review Section 4.8 for the discussion of impacts on soils.

Soil compaction along roads that traverse slopes can create an impermeable barrier to downslope subsurface water flow. This barrier can convert subsurface runoff to surface runoff. They can then route surface runoff to stream channels, and increase peak flows and sediment delivery to streams (Megan and Kidd 1972). Therefore, watersheds with higher road densities, especially roads close to streams, have a higher probability of increased peak flows and sediment yield.

4.10.1 From Special Area Designations

***Alternative A* (No Action)**

Under the current management of Agua Fria National Monument, Perry Mesa ACEC is likely to continue to experience minor degradation of water quality. The degradation occurs from disturbances created by vehicle and OHVs entering stream channels near road crossings and the effects of delivery of sediment from roadways into stream channels.

The national monument's eligible WSR segments would continue to be managed for nonimpairment to WSR values. Management actions to preserve these values would limit or preclude development or vehicular activities that would disturb soil and vegetation. Moreover, no new disturbance and the recovery of existing disturbance would likely reduce erosion and sedimentation, improving the river's hydrologic functions.

Current management of the Bradshaw-Harquahala Planning Area has designated five wilderness areas: Hells Canyon (9,900 acres), Hassayampa River Canyon (11,840 acres), Harquahala Mountains (22,880 acres), Hummingbird Springs (31,200 acres), and Big Horn Mountains (21,000 acres). Under current management in these wilderness areas, erosion and sedimentation of streams would be reduced, and hydrologic function of the areas is likely to improve because of restrictions on motorized vehicles. Managing other uses to minimize disturbance would also improve hydrologic function.

Table 4-3. Areas of Critical Environmental Concern (ACEC) Acreages

ACEC	Alternative A (Current)	Alternative B	Alternative C	Alternative D	Alternative E (Preferred)
Agua Fria National Monument					
Agua Fria Riparian Corridor				13,070	
Indian Creek			330		
Larry Canyon	80		50		
Lousy Canyon			80		
Perry Mesa	9,580				
Silver Creek			350		
Subtotal:	9,660		810	13,070	
Bradshaw-Harquahala Planning Area					
Baldy Mountain ONA				9,080	
Belmont-Big Horn Mountain				77,730	
Black Mesa			5,540	5,540	
Black Butte Raptor Area/ONA			800	14,480	8,260
Harquahala Mountain ONA			41,670	74,940	74,950
Sheep Mountain RNA			4,270	4,270	
Tule Creek		640	640	640	640
Vulture Mountain Raptor Area			2,790	6,120	6,120
Subtotal:		640	55,710	192,800	89,970
Total Acres:	**9,660**	**640**	**56,520**	**205,870**	**89,970**

Alternative B

Under *Alternative B* the impacts of special area designations on water resources in the National Monument would be the same as those described for *Alternative A*.

In the Bradshaw-Harquahala Planning Area managing Tule Creek ACEC would include its closure from mineral development (withdrawal from mineral entry). Withdrawal would eliminate the potential for disturbance to streambanks, soils, and ground cover from mining equipment/vehicle use and other related activities. In the portion closed to vehicles, former routes would revegetate, improving hydrologic function.

Alternative C

Designating four ACECs in Agua Fria National Monument (Silver Creek, Indian Creek, Larry Creek, and Lousy Canyon) will impact water resources by closing the areas to grazing and vehicles. This would encourage revegetation of disturbed areas and would improve hydrologic function.

In the Bradshaw-Harquahala Planning Area six ACECs are proposed under *Alternative C* (Table 4-3).

The following management actions would improve hydrologic function by encouraging revegetation of disturbed areas and reducing erosion and downstream sedimentation:

- mineral entry withdrawal,
- changes or elimination of livestock grazing, and
- closure or mitigation of motorized vehicle routes.

Alternative D

In Agua Fria National Monument, the designation of the Agua Fria River Riparian Corridor ACEC, which would include the ACECs proposed by *Alternative C,* would have impacts similar to *Alternative C.* Management

actions include closing, limiting, or mitigating vehicle routes and planned land acquisitions along Indian Creek. These actions would reduce OHV impacts to native vegetation, streambanks, and water quality. This ACEC is unlikely; however, to result in any measure of protection for water resources beyond that provided by the proclamation (Appendix A).

In the Bradshaw-Harquahala Planning Area impacts under *Alternative D* would be similar to those described for *Alternative C*, but *Alternative D* would close more areas to mineral entry.

***Alternative E* (Preferred Alternative)**

Alternative E would propose no new special area designations in Agua Fria National Monument. Impacts to water resources would be the same as described for *Alternative A*.

In the Bradshaw-Harquahala Planning Area management prescriptions for four ACECs (89,970 acres) would result in impacts similar to those described for *Alternative C*.

4.10.2 From Lands and Realty Management

***Alternative A* (No Action)**

Under the current management of Agua Fria National Monument, lands and realty management is subject to valid existing rights granted before the national monument's designation. Activities might continue if they are not precluded by the proclamation (Appendix A) and do not conflict with the established purpose.

In Agua Fria National Monument, actions for managing valid existing rights could lower water quality under the following conditions:

- construction-related delivery of pollutants and sediment occurs near surface drainages, or
- areas of groundwater recharge or natural processes of wetland or riparian function (e.g. runoff rate, soil erosion rate, water infiltration rate) are compromised.

Disturbances would be temporary, so hydrologic function would probably not change in the long-term.

In the Bradshaw-Harquahala Planning Area, impacts from disposal of as much as 54,370 acres outside MUs, include the potential loss of vegetation from developing those lands and possible increased erosion and sediment yield. Eventual development of the disposal lands in the Upper Agua Fria River watershed could also increase sediment yield in the upstream tributaries of the Agua Fria River and lower the water quality in Agua Fria National Monument. An increase in development could include an increase in the number of wells and increased groundwater use, which could lower groundwater levels and decrease contributions of groundwater to surface flows in the monument.

Acquiring privately owned and State-held lands in the Black Canyon and Lake Pleasant RCAs would create two large blocks of federally managed lands. These acquisitions would consolidate management and help develop healthy native plant communities in the upland and the riparian communities. This outcome, in turn, might affect water resources by increasing ground cover and potentially reducing sediment yield.

Similarly, acquiring lands in the Cordes Junction, Bumble Bee/Williams Mesa MRMAs, and the 4-mile reach of State land along the Hassayampa River would help BLM institute the land health standards that would protect and potentially improve the vegetation and might reduce sediment yield.

Building and maintaining facilities in planned transportation/utility corridors and at communication sites could degrade water quality as construction and operation create ground disturbance that could lead to increased soil erosion and result in increased stream turbidity.

Construction could also disturb riparian vegetation and change the proper functioning condition over limited areas of construction.

Alternative B

The Black Canyon utility corridor would be maintained but narrowed. This narrowing would affect water resources by reducing potential impacts from building and operating utilities in the corridor. Controls on development would minimize runoff into streams and route disturbance in such a way as to minimize impacts to water resources.

In the Bradshaw-Harquahala Planning Areaimpacts from disposal of land would be similar to *Alternative A*, except as much as 58,400 acres are available for disposal.

Building and maintaining planned transportation/utility corridors and communication sites would have impacts similar to those described for *Alternative A*.

Alternative C

Impacts on water resources in the Agua Fria National Monument would potentially be lower from the elimination of the Black Canyon utility corridor which would prohibit more utility right-of-way allocations. Impacts from operating and maintaining current facilities with prior existing rights would be similar to *Alternative A*.

The impacts of disposing of 49,100 acres of BLM-managed Federal lands would be similar to those for the disposal of lands under *Alternative B*.

Building and maintaining planned transportation/utility corridors and communication sites would have impacts similar to those described for *Alternative A*.

Alternative D

Impacts in Agua Fria National Monument would be the same as those described for *Alternative C*.

The impacts on water resources from acquiring private or State lands would be similar to those described for *Alternative B*.

Building and maintaining planned transportation/utility corridors and communication sites would have impacts similar to those described for *Alternative A*.

***Alternative E* (Preferred Alternative)**

Impacts in both planning areas would be similar to *Alternative B*.

4.10.3 From Management of Soil, Air, and Water Resources

***Alternative A* (No Action)**

In Agua Fria National Monument water resources are generally expected to improve through applying erosion prevention measures such as (1) limits on grazing access along streams and (2) control of OHV use in the river corridor. Management would focus on maintaining and improving riparian vegetation cover, which would reduce streambank erosion and sediment yield and generally contribute to the proper functioning condition of riparian areas. In the Bradshaw-Harquahala Planning Area water resources would benefit from incorporating salinity control measures (such as runoff controls and drainage routing) into erosion prevention strategies and rehabilitation treatments. Water resources would also benefit from implementing strategies for assuring spring flows. These actions would increase riparian and upland vegetation cover, which would reduce erosion and sediment yield.

***Alternatives B, C, D,* and *E* (Preferred Alternative)**

In both planning areas management prescriptions for soil, air, and water resources would protect water quality to meet Federal and State standards for designated uses. Moreover,

all land tenure decisions (such as land sales or exchanges) would be reviewed for their impacts to water resources (including protection of instream flows).

The Alternatives progress in their protection of soils, air, and water resources with *Alternative A* being the least protective and *Alternative D* being the most protective. Therefore, *Alternative E* is similar to the protections of *Alternative C.*

4.10.4 From Biological Resource Management

***Alternative A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

In Agua Fria National Monument impacts to water resources are expected from designating the Agua Fria River riparian corridor, which includes management actions, such as planting cottonwood and willow along the Agua Fria River and its tributaries. These changes in riparian vegetation would improve functional condition of the riparian zone.

In the Bradshaw-Harquahala Planning Area impacts to water resources are expected from acquiring water rights to maintain or enhance spring/riparian habitats in the planning unit, which would improve the hydrologic functioning condition of those systems. Additionally, removing all burros at water sources in the Big Horn, Granite Wash, and Harquahala Mountains would reduce soil disturbance and potential soil erosion near those locations, and would promote growth of riparian vegetation at springs, seeps, and streams throughout the planning areas.

Management prescriptions for biological resources would benefit water resources by conserving, enhancing, and restoring water bodies and by increasing native grasses on upland sites and streambanks. These grasses would protect soil, increase infiltration, and reduce sediment yield. BLM would monitor water quality to ensure compliance with Federal and State standards.

4.10.5 From Cultural Resource Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

There are no impacts expected.

4.10.6 From Paleontological Resource Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

There are no impacts expected.

4.10.7 From Recreation Management

***Alternative A* (No Action)**

Under the current management of both planning areas, sites with concentrated recreation could lose vegetation cover (both in riparian and upland vegetation communities) and undergo soil compaction. In riparian areas streambank stability could decrease. Decreased streambank stability could increase soil erosion, sediment yield, and sediment deposition.

SRPs would have conditions and stipulations in place to prevent damage to active or seasonal water courses. Authorized SRPs would not greatly affect current watershed conditions.

Under the current management of the Bradshaw-Harquahala Planning Area unlimited cross-country OHV use on the public lands west of Highway 93 could increase soil erosion, sediment yield, damage to banks of drainages, and sediment deposition. Limiting vehicles to existing routes would maintain current conditions.

Also, in the Bradshaw-Harquahala Planning Area, impacts to water resources from recreation management are expected from the increased water use by visitors and the proliferation of unplanned and unmanaged recreational trails and facilities. Increased water use includes the need to secure legal entitlement to water for recreation and domestic uses (e.g. equestrian trails, campgrounds) and possibly drilling wells or developing spring sources to provide water for visitors.

Impacts from recreation management include the following:

- soil compaction from visitor use and OHV traffic,
- erosion due to vegetation loss,
- increased sediment yield due to concentrated use in and near water,
- decreased water quality by leaking OHV engine oil, and
- degradation of air quality by OHV engine emissions.

Alternative B

In the Front Country (57,900 acres) and Passage (300 acres) RMZs within Agua Fria National Monument sediment would continue to move from roadways into stream channels in certain areas open to OHV use. OHVs crossing streams would continue to increase turbidity in stream channels. OHVs crossing streams could degrade water quality by leaking engine oil. In *Alternative B* there would be 145 miles of open motorized route.

In the Bradshaw-Harquahala Planning Area allocating eight SRMAs and two areas to maintain or enhance wilderness characteristics for management of recreation use could reduce soil erosion and sediment yield into drainages due to (1) building new facilities, such as parking lots and staging areas, and (2) maintaining a diverse network of motorized vehicle routes. These actions would harden some of the heavily used areas and would require motorized vehicles to stay on designated trails. Some activities that degrade water resources, as described in *Alternative A*, would continue.

Alternative C

In the Agua Fria National Monument, impacts would be similar to those described for *Alternative B*; except the Front Country RMZ would be reduced to 42,410 acres and the Passage RMZ would be reduced to 70 acres. Open motorized routes would also be reduced to 135 miles.

Impacts under *Alternative C* are expected to be similar to those described for *Alternative B*, but to a lesser degree due to (1) an increase in closed miles of motorized routes (Appendix N) and (2) the addition of more-restrictive motorized and non-motorized recreation prescriptions in nine SRMAs, six areas allocated to maintain or enhance wilderness characteristics, three ONA ACECs, one RNA ACEC, and nine other ACECs.

Alternative D

In the Agua Fria National Monument, impacts would be similar to those described for *Alternative C;* except the Front Country RMZ would be reduced to 1,530 acres and the Passage RMZ would be 990 acres. Open motorized routes would also be reduced to a total of 47 miles.

In the Bradshaw-Harquahala Planning Areaimpacts are expected to be similar to those described for *Alternative C*, but to a significantly lesser degree. *Alternative D* proposes a greater net closure of motorized travel routes and the addition of more-restrictive motorized and non-motorized recreation travel prescriptions in nine SRMAs.

***Alternative E* (Preferred Alternative)**

In the national monument, impacts would be similar to those under *Alternative C* and *D* because of moderately restrictive limitations on vehicular access and visitor use in a Back Country Zone of 57,200 acres. Riparian and upland vegetation would benefit from decreased access, resulting in improved functional condition of riparian zones. As a result, improvements would occur in streams from increased riparian zone health and streambank stabilization, enhancing stream morphology.

Impacts in the Bradshaw-Harquahala Planning Area are expected to be similar to those described for *Alternative C.* As modeled in Appendix N, the net closure of motorized travel routes would be similar to those in *Alternative B.* Application of motorized and non-motorized recreation travel prescriptions would occur in three large SRMAs and six Recreation Management Zones (RMZs).

4.10.8 From Visual Resource Management

***Alternative A* (No Action)**

There are no impacts expected.

***Alternatives B, C, D,* and *E* (Preferred Alternative)**

Applying VRM Class I, II, and III standards and objectives to all new projects and land use authorizations could result in restrictions on some kinds of land development and use in the national monument and in all management units. Streams and drainages would experience decreased delivery of sediment due to limitations on construction projects and OHV use.

4.10.9 From Rangeland Management

***Alternative A* (No Action)**

Except for the Larry Canyon ACEC, livestock grazing would continue under the terms of existing permits and leases. Impacts to water resources would include trampling and reduced vegetation, resulting in increased soil erosion in riparian areas (see section 4.8). Livestock grazing in riparian areas can also reduce streambank stability by reducing vegetation cover. This can lead to increased sediment yield, sediment deposition in streams, and possible changes in stream morphology, which reduces the functional condition of the riparian system.

In the Bradshaw-Harquahala Planning Area, applying rangeland health standards to livestock grazing would decrease soil disturbance, compaction, and erosion. Water resources would benefit from reduced sediment yield and deposition in streams, as well as from enhanced overall riparian functional condition. In both planning areas the guidelines adopted in Arizona Guidelines for Grazing Administration (see Rangeland Management) would benefit water resources by:

- maintaining or promoting ground cover that would provide for infiltration, permeability, soil moisture storage, and soil stability suitable for the ecological sites in management units; and
- maintaining or promoting sufficient vegetation to maintain sediment capture, groundwater recharge, and streambank stability, thus promoting stream channel morphology (e.g. gradient, width/depth ratio, channel roughness, and sinuosity) and functions suitable to climate and landform.

With the implementing of these guidelines, hydrologic function would improve with decreases in soil erosion, sediment yield, and sediment deposition in streams.

Alternative B

In both planning areas, impacts to water resources from rangeland/grazing management in uplands would be similar to those described for *Alternative A* except that grazing in riparian areas would be limited to winter, which would further reduce impacts to riparian hydrologic functions. This practice would reduce impacts to riparian vegetation and provide enhanced stabilization of stream morphology and decreased stream erosion.

Alternative C

In both planning areas, impacts to water resources from grazing in uplands would be similar to those described for *Alternative A*, except that upland grazing would be greatly reduced and grazing in riparian areas would be eliminated. This would further reducing impacts to hydrologic functions and significantly improve riparian vegetation and stream morphology.

Alternative D

In both planning areas water resources would benefit from the following:

- closing existing livestock grazing allotments,
- canceling all current livestock authorizations for the duration of the plan, and
- building fencing to control livestock use of the unfenced public lands.

Of all the Alternatives, *Alternative D* would cause the greatest improvement in water resources and riparian zone vegetation. Soil disturbance, sediment yield, and sediment deposition in streams would be lower than under any other Alternative.

***Alternative E* (Preferred Alternative)**

For the national monument, impacts would be the same as those under *Alternative B*, under which livestock would not graze in riparian areas during winter. Vehicular access would also be limited in the Back Country RMZ, which would benefit both riparian and upland vegetation to some extent by lessening damage to riparian areas, thus improving the overall functional condition of hydrologic processes in the riparian zones. Decreased erosion and sediment loading in streams would result.

For the Harquahala-Bradshaw Planning Area, impacts would be similar to *Alternative A*. management actions would focus on improving proper functioning condition; although, no specific restrictions are prescribed at this time. Restrictions such as seasonal grazing limitations could be implemented if monitoring finds deteriorating functional conditions.

4.10.10 From Minerals Management

***Alternative A* (No Action)**

For the national monument all Federal minerals would be withdrawn from all forms of mineral entry, including exploration. Thus, no impacts to water resources are expected from new mining claims. Valid existing mining claims might be developed, which could degrade water resources. These claims are gold placer claims and could affect water resources if they are developed, because stream gravels are processed by suction dredge and washed and screened to concentrate the gold particles. Impacts from placer mining could include the following:

- increasing sediment and turbidity in the stream,
- disrupting the streambed,
- changing stream morphology, and
- altering streamflow patterns and possibly riparian areas.

In the Bradshaw-Harquahala Planning Area, should exploration or development of mineral resources be pursued, special stipulations would be incorporated into the operating plan after the results of site-specific environmental assessments for each action are known. Impacts

cannot be projected before preparing such assessments, which would include methods, mitigation, and rehabilitation plans to meet the required conditions established in aquifer protection permits, Section 404 permits, and other permits for protecting water quality. Adverse effects to water resources from minerals management would then be minimized.

Locatable Minerals

The planning area would generally be left open to mineral location and development. Exploration for and development of locatable minerals are likely to somewhat degrade water resources and could result in increased soil erosion, sediment yield, and sediment deposition in streams, and changes in stream morphology. BLM would continue to administer mining in the Bradshaw-Harquahala Planning Area on a case-by-case basis and comply with regulations to prevent unnecessary and undue degradation of the environment (43 CFR 3715 and 43 CFR 3809).

Saleable Minerals

BLM-administered mineral estate serves as a major source of aggregate. Removing aggregate from floodplains could impair floodplain hydrologic function by destabilizing streambanks and contributing to increased erosion and sedimentation. Increased soil erosion, sediment yield, and sediment deposition in streams could also result.

Leasable Minerals

Areas open to leasable mineral development under current management could become a potential source of water quality degradation, if they are mined.

Alternative B

Impacts to Agua Fria National Monument would be the same as for *Alternative A*.

In the Bradshaw-Harquahala Planning Area, potential impacts on water resources are related to the amount of land open to mineral development (see Table 4-4). All Federal lands would be open to mineral entry except for areas legislatively withdrawn and other specially segregated areas. Impacts for this Alternative would be similar to *Alternative A.*

Alternative C

Impacts to Agua Fria National Monument would be the same as for *Alternative A*.

As in *Alternative B*, potential impacts in the Bradshaw-Harquahala Planning Area are related to the amount of land open to mineral development. Under this Alternative, the impacts would be substantially lower than those under *Alternative B* because more land would be removed from mineral development.

Alternative D

Impacts to Agua Fria National Monument would be the same as for *Alternative A.*

Impacts in the Bradshaw-Harquahala Planning Area would be lowest under this Alternative since the most amount of land would be removed from mineral development.

***Alternative E* (Preferred Alternative)**

Impacts to Agua Fria National Monument would be the same as for *Alternative A*.

In the Bradshaw-Harquahala Planning Area under *Alternative E*, impacts would be similar to those under *Alternative A*, except that riparian areas in the Black Canyon corridor would be closed to mineral material disposal, which would keep activity that could reduce water quality from occurring in those areas.

For the Bradshaw-Harquahala Planning Areaimpacts to mining would be the same as those under *Alternative B.*

4.10.11 From Fire Management

***Alternative A* (No Action)**

Where prescribed burning is conducted in Agua Fria National Monument the use of heavy equipment could disturb soil cover, thereby increasing soil erosion and stream sedimentation. The benefits of prescribed burning would greatly outweigh the potential harm from the use of heavy equipment.

Prescribed burning would allow fire to create a natural mosaic and establish vegetation communities of uneven age classes. Species diversity would be maintained, desirable perennial grasses would increase, and brush would decrease. This would increase ground cover, which results in increased infiltration and reduced runoff, erosion, and sedimentation. Because fire-related disturbances are temporary, long-term impacts to water resources would be unlikely.

Under the current management of both planning areas, full suppression of wildfires would decrease desirable perennial grasses and increase brush. The resulting increase in bare ground could increase soil erosion, sediment yield, and sedimentation. Shrubs would continue to invade the upland areas at the expense of desirable perennial grasses. As a result, herbaceous cover on the soils surface would decline with related hydrologic effects, including lower infiltration, increased runoff, increased erosion, and increased sedimentation. Over time, greater peak flood flows and sedimentation could alter channel morphology. Possible adjustments to stream channels include increased bank instability, filling of pools, and channel widening. Use of heavy equipment during suppression could also degrade soils by promoting an increase in soil disturbance.

***Alternatives B, C, D,* and *E* (Preferred Alternative)**

In both planning areas fire use, including natural starts, prescribed burning and mechanical treatments, would have impacts similar to those described in *Alternative A* for the Agua Fria National Monument.

4.10.12 From Wild Horse and Burro Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

No wild horses or burros are present in Agua Fria National Monument, so no impacts would occur.

In the Bradshaw-Harquahala Planning Area removing burros that damage sensitive areas, such as Browns Canyon, would allow those areas to recover from intense use, leading to improved vegetation conditions on streambanks and improved hydrologic function.

4.10.13 From Management of Transportation and Public Access

***Alternative A* (No Action)**

Proliferation of unplanned and unmanaged routes could continue to degrade stream bank stability and water resources.

Under the current management of the Bradshaw-Harquahala Planning Area unlimited cross-country OHV use on the public lands west of Highway 93 could increase soil erosion, sediment yield, damage to banks of drainages, and sediment deposition. Limiting vehicles to existing routes would maintain current conditions.

Alternative B

In Agua Fria National Monument sediment would continue to move from roadways into stream channels in certain areas open to OHV

use. OHVs crossing streams would continue to increase turbidity in stream channels. OHVs crossing streams could degrade water quality by leaking engine oil.

Closing routes would reduce the above described impacts. Riparian and upland vegetation would benefit from decreased access, resulting in improved functional condition of riparian zones.

In the Bradshaw-Harquahala Planning Area, maintaining a diverse network of motorized vehicle routes would harden some of the heavily used areas and would require motorized vehicles to stay on designated trails.

Alternative C

Impacts under *Alternative C* are expected to be similar to those described for *Alternative B,* but to a lesser degree due to an increase in closed miles of motorized routes.

Alternative D

Impacts are expected to be similar to those described for *Alternative C*, but to a significantly lesser degree. *Alternative D* proposes a greater net closure of motorized travel routes.

***Alternative E* (Preferred Alternative)**

In the national monument, impacts would be similar to those under *Alternative C* and *D* because of moderately restrictive limitations on vehicular access and visitor use.

Impacts in the Bradshaw-Harquahala Planning Area are expected to be similar to those described for *Alternative C*.

4.10.14 From Management of Wilderness Characteristics

***Alternative A* (No Action)**

Currently no areas are allocated for the management of wilderness characteristics. As a result, no impacts are expected.

Alternative B

In the Agua Fria National Monument no impacts are expected.

In the Bradshaw-Harquahala Planning Area, 56,040 acres would be allocated for the management of wilderness characteristics. These management areas could reduce soil erosion and sediment yield into drainages caused by human activity.

Alternative C

Impacts would be the same as *Alternative B,* except that a larger area would be allocated for management of wilderness characteristics (107,510 acres).

Alternative D

Impacts would be the same as *Alternative B* except that 91,480 acres would be allocated for management of wilderness characteristics.

***Alternative E* (Preferred Alternative)**

Impacts would be the same as *Alternative B* except that 96,420 acres would be allocated for management of wilderness characteristics.

4.11 Impacts on Biological Resources

Data Summary/Analytical Assumptions

The statements made in the analysis of impacts to the biological resources are based on the professional judgment of biologists reviewing and analyzing the Alternatives.

All activities undertaken or authorized by the BLM are subject to standard policy and guidance for the implementation of the Endangered Species Act and the National Environmental Policy Act. These policies and procedures should be fundamental considerations when evaluating the impacts of management actions and decisions on listed species.

4.11.1 From Special Area Designations

***Alternative A* (No Action)**

According to the current management guidance for Agua Fria National Monument, designating Larry Canyon and Perry Mesa ACECs are decisions that would remain in place following the implementing of this RMP. The 80-acre Larry Canyon ACEC was designated to protect pristine riparian habitat. As a result, motor vehicles and mineral entry are prohibited. However, Larry Canyon ACEC is located entirely within a steep canyon inaccessible to cattle and without any vehicle routes. Because the national monument proclamation withdrew the area from mineral entry, retaining the ACEC designation provides no measure of protection not otherwise provided by the proclamation (Appendix A).

Perry Mesa ACEC would provide the same level of protection from OHV impacts as provided by the proclamation.

In the eligible WSR segments of the Agua Fria River, wildlife habitat would benefit from actions taken to ensure no adverse impacts occur to values that define suitability for designation. Vehicle restrictions would reduce streambank erosion, water quality degradation, and adverse impacts to riparian vegetation and wildlife habitat.

Retaining the Harquahala Mountain Summit Scenic Road, which is an unpaved OHV route, would harm wildlife. Vehicle traffic along the route would occasionally disturb bighorn sheep and occasionally kill desert tortoises.

Management actions in designated wilderness areas (Hells Canyon, Hassayampa River Canyon, Harquahala Mountains, Hummingbird Springs, and Big Horn Mountains) would protect vegetation and wildlife habitat by continuing to restrict OHV use of these areas.

Alternative B

As in *Alternative* A, in Agua Fria National Monument continued management of the areas suitable for wild and scenic river corridors would protect sensitive riparian habitat. Designating Bloody Basin Road as a back country byway would likely increase recreation use of the area, thereby increasing ground disturbance from vehicular use and periodic maintenance. Wildlife deaths might occur as vehicular use increases. Bloody Basin Road crosses both arms of the pronghorn antelope movement corridor, near the Horseshoe Ranch and west of Badger Springs Wash, connecting habitat in Agua Fria National Monument to habitat in the Prescott and Tonto National Forests. Increased recreational use of the Bloody Basin Road Back Country Byway might impede pronghorn movement in the corridor and potentially alter behavior, including breeding.

In the Bradshaw-Harquahala Planning Area, designating Tule Creek ACEC would protect 1.3 miles of riparian habitat for the endangered Gila topminnow and other riparian and aquatic species by focusing conservation management on the area's regionally important deciduous

riparian vegetation. Closing the stream channel to vehicle use and livestock grazing and withdrawing this area from mineral entry would do the following:

- protect streambanks,
- reduce soil erosion, and
- limit riparian habitat damage from mining equipment/vehicle use and other mining.

The management actions would benefit 640 acres of Category II desert tortoise habitat by providing more protection and management emphasis to the area.

Designating the Constellation Mine Road as a Back Country byway could increase recreational use of the roadway and could increase human disturbance of wildlife populations and vehicle-related wildlife mortality.

Impacts from wilderness management would be the same as described for Alternative A.

Alternative C

Four new ACECs would be created in the national monument to protect 810 acres of rare riparian deciduous forest and habitat that supports the Gila chub, yellow-billed cuckoo, and several other priority species. Limiting vehicular travel in the Silver Creek (350 acres), Indian Creek (330 acres), Larry Creek (50 acres), and Lousy Canyon (80 acres) ACECs would have little effect on wildlife because only Silver Creek has any vehicular access which is only a single ford. As in *Alternative A*, these ACECs are unlikely to result in any measure of wildlife habitat protection beyond that currently provided by the monument proclamation (Appendix A), the Endangered Species Act (ESA), and Land Health Standards.

In the Bradshaw-Harquahala Planning Area six ACECs are proposed for designation under *Alternative C*: Harquahala Mountains (64,170 acres), Vulture Mountains (2,790 acres), Black Butte Raptor (800 acres), Sheep Mountain RNA (4,270 acres), Black Mesa (5,540 acres), and Tule Creek (640 acres).

The management actions for designating the Harquahala Mountain ACEC would (1) increase forage for bighorn sheep by reducing livestock competition during lambing season and (2) protect unique vegetation communities. Banning new vehicle routes would reduce impacts to vegetation and the likelihood of habitat fragmentation. Spring sources would be protected from livestock impacts, increasing riparian vegetation, wildlife cover, and forage. Management actions would better protect desert tortoise habitat from conflicting human activities. Some temporary impacts to vegetation and wildlife habitat might occur during fence building to exclude livestock from springs.

Management actions related to designating the Vulture Mountains and Black Butte ACECs would benefit nesting raptors by reducing the potential for human harassment within 1/2 mile of nest sites during the nesting season and providing added protection against disturbance of adjacent foraging areas. The actions would also provide more protection for desert tortoise habitat from conflicting human activities.

Management actions related to designating the Sheep Mountain RNA ACEC would benefit wildlife, including desert tortoises, by reducing human harassment and providing some protection of habitat from ground disturbances, including mining.

Impacts related to designating Tule Creek ACEC would be similar to those described for *Alternative B*. Impacts related to designating Constellation Mine Road as a back country byway would be similar to those described for *Alternative B*. Designating Black Mesa ACEC, while not specifically for biological resources, would provide management emphasis and some degree of habitat protection from mining disturbances. Wilderness management would have the same impacts as described for *Alternative A*.

The designation of these 10 total ACECs in the planning areas would add additional protection to 60,420 acres of Category I desert tortoise habitat, 15,310 acres of Category II habitat and 2,050 acres of Category III habitat as well as emphasize protection of 10.4 miles of riparian habitat. See Table 4-5 for comparisons of tortoise and riparian habitats protected in ACECs and WHAs by alternative.

Table 4-5. Desert Tortoise Habitat Acres by Alternative

Desert Tortoise Habitat	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E
ACEC (Total Acres)	*9,660*	*640*	*56,520*	*192,800*	*89,970*
Category 1 (ac)	0	0	37,470	51,920	51,570
Category II (ac)	0	640	5,890	106,030	19,040
Category III (ac)	0	0	5,940	15,510	7,750
Riparian (mi)	15.50	1.30	10.40	49.50	1.70
WHA (Total Acres)	*0*	*64,220*	*196,510*	*57,530*	*179,640*
Category I (ac)	0	60,420	6,520	0	3,610
Category II (ac)	0	1,710	126,740	2,850	129,340
Category III (ac)	0	2,050	10,690	3,630	4,040
Riparian (mi)	0	0.40	14.70	5.00	14.70

Alternative D

In Agua Fria National Monument the Agua Fria River Riparian Corridor ACEC (13,070 acres) would include the ACECs proposed by *Alternative C* but would also incorporate much more riparian habitat. Management actions include closing, limiting, or mitigating vehicle routes and prioritizing land acquisitions along Indian Creek. These actions would benefit wildlife species and habitat, including the Gila chub, yellow-billed cuckoo, and several other priority species in a few areas. OHV impacts to native vegetation, streambanks, and water quality would be reduced. However, this ACEC is unlikely to result in any measure of wildlife habitat protection beyond that provided by the monument proclamation (Appendix A), the Endangered Species Act, and Land Health Standards.

In the Bradshaw-Harquahala Planning Area eight ACECs are proposed for designation under *Alternative D*: the Baldy Mountain ONA (9,080 acres), Sheep Mountain RNA (4,270 acres), Vulture Mountains (6,120 acres), Harquahala Mountains ONA (74,940 acres), Belmont-Big Horn Mountains (77,730 acres), Black Butte Raptor ONA (2,580 acres), Black Mesa (5,540 acres), and Tule Creek (640 acres).

Management actions and impacts related to designating Sheep Mountain RNA ACEC would be similar to those described for *Alternative* C, but would also include removing all fencing, which would allow unimpaired movement of wildlife with large home ranges.

Fencing would be removed because grazing would be eliminated on BLM's lands.

Impacts of designating Vulture Mountains ACEC would include those described for *Alternative C*. In addition, *Alternative D* would expand the ACEC from 2,790 acres to 6,120 acres, protect nest sites from disturbances within 1 mile and include the total closure of the area to mineral entry, protecting nesting raptors and desert tortoise habitat from a wider range of potential threats.

Black Butte Raptor ONA ACEC would be expanded to 2,580 acres to protect a larger area. The impacts would be similar to those described for *Alternative C,* but would include the total closure of the area to mineral entry, protecting nesting raptors and desert tortoise habitat from a wider range of potential threats over a larger area.

Management actions in Harquahala Mountains ACEC would be similar to those described for

Alternative C but would include prohibiting the building of new livestock fences and removing all fencing, which would facilitate wildlife movement throughout the area. Closing the ACEC to all forms of mineral entry would result in minimal human intrusion and less ground disturbance from mining. These management actions would benefit the resident bighorn sheep population, desert tortoises, and other wildlife by reducing mining impacts to vegetation.

Designating Belmont-Big Horn Mountains ACEC would benefit wildlife populations and habitat by doing the following:

- reducing or limiting vegetation disturbance and harassment from some activities,
- potentially acquiring important habitat, and
- eliminating fences that hinder deer and bighorn sheep movement.

Management actions would add management emphasis and protection to desert tortoise habitat.

Designating Baldy Mountain ACEC would benefit wildlife, including desert tortoises, by reducing human harassment and providing some protection of habitat from ground disturbances, including mining.

Impacts of designating Tule Creek ACEC would be similar to those described for *Alternative B* but would include protecting more area from vehicle disturbances, which affect upland wildlife, including desert tortoises.

Impacts from wilderness management would be the same as described for *Alternative A*.

The designation of these nine ACECs would add additional protection to 66,940 acres of Category I desert tortoise habitat, 167,710 acres of Category II habitat and 6,000 acres of Category III habitat as well as emphasize protection of 49.5 miles of riparian habitat. See Table 4-5 for comparisons of tortoise and riparian habitats protected in ACECs and WHAs by Alternative.

***Alternative E* (Preferred Alternative)**

In Agua Fria National Monument impacts of designating Bloody Basin Road as a Back Country byway would be similar to those described for *Alternative B*.

In the Bradshaw-Harquahala Planning Area four ACECs are proposed for designation: Harquahala Mountains ONA ACEC (74,940 acres), Vulture Mountains ACEC (6,120 acres), Black Butte ONA ACEC (8,260 acres), and Tule Creek ACEC (640 acres).

Impacts of designating Tule Creek ACEC would be similar to those described for *Alternative C*. Impacts of designating the Vulture Mountains ACEC would be similar to those described for *Alternative D* except that the habitat would remain susceptible to mining disturbances.

Designating and managing the Harquahala Mountains ONA ACEC would reduce motor vehicle disturbances to bighorn sheep, desert tortoises, and other wildlife. It would also set a high priority on restoring and maintaining vegetation diversity, spring sources, and healthy wildlife populations. Closing Browns Canyon to livestock grazing would increase riparian vegetation diversity and abundance, thus improving habitat quality for wildlife. Limiting the building of new roads and fences would facilitate wildlife movement throughout the area. Allocating the area as VRM Class II may affect wildlife management activities (see section 4.11.8 From Visual Resource Management). Developing visitor facilities might alter wildlife movement through and around those facilities.

Management actions for designating the Black Butte ONA ACEC would benefit nesting raptors (1) by reducing the potential for human harassment within 1 mile of nest sites during the nesting season and (2) by providing added protection against disturbance of adjacent foraging areas. The actions would better protect desert tortoise habitat from conflicting human activities. Allocating the area as VRM Class II may affect wildlife management activities (see

section 4.11.8 From Visual Resource Management).

The designation of these four ACECs would add additional protection to 74,490 acres of Category I desert tortoise habitat, 19,040 acres of Category II habitat and 7,780 acres of Category III habitat as well as emphasize protection of 1.7 miles of riparian habitat. See Table 4-5 for comparisons of tortoise and riparian habitats protected in ACECs and WHAs by Alternative.

Impacts from wilderness management would be the same as described for *Alternative A.*

4.11.2 From Lands and Realty Management

***Alternative A* (No Action)**

In Agua Fria National Monument, continued use of the existing utility right-of-way is expected to temporarily harm vegetation because of ground disturbance during operation and maintenance. These activities can also encourage the establishment of invasive weeds in or next to the disturbed areas.

Acquiring privately owned and State-held lands in the Black Canyon and the Lake Pleasant RCAs would create two large blocks of federally managed lands. These blocks would consolidate management and help develop healthy native plant communities in upland and riparian communities. Healthy native plant communities, in turn, would benefit wildlife, including special status species; such as desert tortoise, by providing adequate forage, cover, and breeding habitat.

Similarly, acquiring lands in the Cordes Junction, Bumble Bee, and Williams Mesa MRMAs and the 4 mile reach of State land along the Hassayampa River would help BLM institute the Land Health Standards that would protect and restore wildlife habitat in these areas.

Building more utilities, transportation corridors, and communications sites would disturb vegetation in the facility footprint and could encourage the establishment of invasive weeds in or next to the disturbed areas. Linear features normally authorized by right-of-way can have the following affects:

- fragment habitat,
- prevent wildlife movement,
- result in loss of habitat
- result in wildlife collisions,
- increase human presence and harassment,
- displace individual animals,
- degrade habitat quality, and
- facilitate long-term human population growth.

Building and operating facilities in the Meade-Phoenix and Parker-Liberty transportation corridors, the Central Arizona Project corridor, the future gas line corridor, and the El Paso Natural Gas Company's No. 1104 corridor could create barriers to wildlife movement and disturb Category I, II, and III tortoise habitat.

Alternative B

In Agua Fria National Monument narrowing the Black Canyon utility corridor would reduce potential impacts to vegetation and wildlife habitat during the building and operating of utilities.

Impacts from disposing of up to 53,143 acres of land outside the MUs would include the potential loss of vegetation and wildlife habitat on those lands, including 10,709 acres of desert tortoise habitat.

Acquiring lands meeting the criteria described for Management Common to All Action Alternatives would benefit vegetation and wildlife by consolidating management under Federal ownership and reducing the potential for habitat disturbance from non-Federal projects.

Building and maintaining facilities in planned transportation and utility corridors and

communication sites would have similar impacts to those described for *Alternative A.* The Black Canyon Corridor would be expanded 1 mile west of its current western boundary to accommodate future utilities outside the national monument. There are no current plans by industry to construct additional utility lines through that corridor within the life of this plan. Proposals for utility development would be confined to the expanded corridor and impacts would be addressed in an Environmental Assessment or Environmental Impact Analysis conducted when a project is proposed.

Alternative C

Eliminating the Black Canyon utility corridor would prohibit more utility rights-of-way in Agua Fria National Monument. No other utility impacts to vegetation or wildlife habitat are expected beyond operating and maintaining the existing facilities with prior existing rights.

In the Bradshaw-Harquahala Planning Area the impacts on biological resources from acquiring non-Federal lands and disposing of 49,100 acres of BLM managed Federal land would be similar to those described for *Alternative B.*

Building and maintaining planned transportation and utility corridors and communication sites would have similar impacts to those described for *Alternative A*. The Black Canyon Corridor would be expanded 2 miles west of its current western boundary to accommodate future utilities outside the national monument. There are no current plans by industry to construct additional utility lines through that corridor within the life of this plan. Proposals for utility development would be confined to the expanded corridor and impacts would be addressed in an Environmental Assessment or Environmental Impact Analysis conducted when a project is proposed.

Alternative D

In Agua Fria National Monument eliminating the Black Canyon utility corridor would have impacts similar to those described for *Alternative C.*

In the Bradshaw-Harquahala Planning Area, building and maintaining facilities in planned transportation and utility corridors and at communication sites would have impacts similar to those described for *Alternative A.* The portion of the Black Canyon corridor west of Interstate 17 would remain the same as it is currently, but the corridor would be expanded south to include BLM's land past Black Canyon City and across Table Mesa. This would create a couple of very narrow places in the corridor which may make it impractical for future utility development, or which will limit placement of facilities, increasing the possibility of having power line towers impacting sensitive resources.

The impacts on biological resources from acquiring private or State lands would be similar to those described for *Alternative B.*

***Alternative E* (Preferred Alternative)**

In Agua Fria National Monument narrowing the Black Canyon utility corridor would have impacts similar to those described for *Alternative B.*

In the Bradshaw-Harquahala Planning Area the impacts on biological resources from acquiring non-Federal lands and disposing of 38,755 acres of BLM's managed Federal lands would be similar to those described for *Alternative B.*

In the Bradshaw-Harquahala Planning Area, building and maintaining facilities in planned transportation and utility corridors and at communication sites would have impacts similar to those described for *Alternative A,* but the portion of the Black Canyon corridor west of Interstate 17 would be expanded westward 1 mile from the Bumblebee area south, and 2 miles from Bumblebee north. The impacts of the corridor expansion would be similar to those describe in *Alternatives B* and *C.*

The impacts on biological resources from acquiring private or State lands would be similar to those described for *Alternative B*.

4.11.3 From Management of Soil, Air, and Water Resources

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

Implementing activity plans to maintain or improve watershed conditions, soil cover, and water flows would benefit biological resources by maintaining or improving riparian vegetation quality, species diversity, and water quality in select drainages.

4.11.4 From Biological Resource Management

***Alternative A* (No Action)**

In Agua Fria National Monument proposed landscape improvements, such as cottonwood and willow plantings along the Agua Fria River and its tributaries, would increase the density and quality of the riparian plant communities and improve the quality of wildlife habitat.

Firewood collection within the monument would be prohibited where it affects wildlife habitat, so no impact to biological resources is expected.

Continued stocking of federally listed sensitive native fish such as the Gila chub, Gila topminnow, and desert pupfish, into suitable habitat in the Agua Fria watershed could increase the population size, geographic distribution, and overall viability of these native fishes.

Modifying livestock fencing would facilitate pronghorn antelope movement between lambing and foraging areas.

Protecting Arrastra Creek, Antelope Creek, Weaver Creek, and the Harquahala Mountains would maintain vegetation and wildlife habitat.

Cooperating with the Arizona Game and Fish Department (AGFD) to acquire water rights in addition to reducing competition for water among big game species, livestock, and burros would ensure the legal availability of water and maintenance of flows in seeps and springs throughout the Bradshaw-Harquahala Planning Area. This water would maintain aquatic and wetlands vegetation and wildlife.

The use of native plant species when restoring or rehabilitating disturbed or degraded rangelands would reestablish native rangeland plant communities and improve forage and habitat quality for wildlife.

Protecting significant cliff areas in the Big Horn and Vulture Mountains and the Black Butte area would benefit raptors, including golden eagles, by reducing human harassment during their nesting season. Limits on the use of the area by wild burros and restrictions on other rights-of-way would protect raptor foraging areas from degradation and disturbance.

Protecting bighorn sheep lambing areas in the Harquahala Mountains from habitat disturbance and disposal would increase forage quality and quantity and reproductive success in sheep populations.

Alternative B

Most of the management prescriptions for biological resources apply to all action Alternatives; therefore, with the exception of allocated wildlife habitat areas and other special areas that influence habitat management, there is little difference between Alternatives. All of the actions discussed below are designed to maintain or improve the condition of priority wildlife populations and priority habitats.

Applying the Land Health Standards to all BLM-authorized activities would benefit biological resources by:

- reducing soil erosion,
- restoring and maintaining the functional condition of riparian habitats,
- ensuring that progress is made toward desired plant communities in both riparian and upland areas, and
- reducing the presence of invasive species.

Implementing these standards would place a high priority on the habitat needs of special status species where wildlife and other land uses conflict.

Reintroducing, transplanting, and supplemental stocking of wildlife, including game, nongame, and endangered species, would enhance biological resources by (1) restoring or maintaining wildlife populations, distributions, and genetic diversity and (2) contributing to the conservation and recovery of listed species.

Implementing desert tortoise management standards and actions would lead to conserving and protecting tortoise populations and habitat. Habitat protection for tortoises would affect other wildlife species that use the same habitat, such as rosy boa, chuckwalla, Gila monster, mule deer, and desert bighorn sheep.

Management direction provided by Desired Future Condition (DFC) objectives would benefit biological resources. The objectives would protect and conserve priority habitats and priority species, implement approved recovery plans, and contribute toward the conservation and recovery of listed threatened or endangered species.

Considering the impacts of permitted activities on priority wildlife species and priority habitats in determining conformance with the management direction provided by the DFC objectives would ensure maintenance of habitat quantity and quality, minimize or avoid "Take" of migratory birds, and generally conserve biological resources.

Management direction provided by DFC objectives would benefit biological resources by establishing habitat standards whereby habitat quality would be protected for many riparian and upland species. These objectives would be considered part of Standard Three of the Land Health Standards and be implemented using BLM's discretion.

The management action designed to protect springs and seeps would affect biological resources by protecting from overexploitation these important habitat features and their value to biological resources and natural processes.

The management action to maintain wildlife water availability would ensure that water-dependant wildlife would continue to have access to existing water sources and new water sources could be built where needed to maintain, restore, or enhance populations. This action would affect the distribution and abundance of some wildlife during some seasons. Research is ongoing to look at impacts of artificial wildlife waters.

Implementing standards for artificial water design, water quality monitoring, and water rights protection would benefit biological resources by protecting aquatic wildlife habitat quality and quantity as well as wildlife access to water.

Prohibiting domestic sheep and goat grazing within nine miles of occupied desert bighorn sheep habitat will significantly reduce the likelihood of disease transmission to the wild sheep populations.

Guidance on exotic species management would benefit biological resources by protecting native wildlife and plants by emphasizing the restoring and maintenance of native species.

The management action to evaluate and mitigate impacts to sensitive wildlife habitat would benefit biological resources by giving wildlife habitat a priority over motorized recreation when conflicts are found.

Land tenure decisions would affect biological resources by ensuring that endangered species

conservation or recovery values are retained on Federal lands.

The management action to continue to manage wildlife habitat cooperatively and in partnership with the AGFD and other entities would benefit biological resources by focusing management emphasis and resources on high-priority issues and avoiding costly redundancy.

The Agua Fria National Monument Proclamation (Appendix A) describes wildlife and habitats, emphasizing their management. This emphasis places a high priority on biological resources when conflicts arise between wildlife management and other land uses.

Collection of dead and down firewood for campfire use in the monument would remove small amounts of dead woody material used by some wildlife species. In most places the woody material selected for firewood is from species targeted for reduction in plans to enhance the diversity and health of the native desert grasslands. Impacts to biological resources are expected to be negligible. Collection of firewood in riparian areas could reduce habitat for wildlife dependent on dead and down woody material. Though the impact of wood collection is expected to be low, provisions to temporarily or permanently close areas to wood collection to prevent resource damage should ensure it.

In the Bradshaw-Harquahala Planning Area impacts to biological resources from firewood and vegetation collection would be essentially the same as those described for the national monument, except that noncommercial collection of some wood and cacti skeletons is allowed. Restricting commercial collection would protect from overexploitation stands of ironwood and mesquite that provide valuable habitat for many birds and other wildlife. In addition to closing, limiting, or mitigating motorized vehicle routes in the Harquahala Mountains WHA (64,220 acres), prohibiting the building of rangeland improvements in Browns Canyon and the Inner Basin would benefit biological resources by reducing impacts to Sonoran desertscrub, chaparral vegetation, and priority wildlife habitat, including habitat for mule deer, bighorn sheep, and desert tortoise.

The designation of the Harquahala Mountain WHA would add additional protection to 60,420 acres of Category I desert tortoise habitat, 1,710 acres of Category II habitat and 2,050 acres of Category III habitat as well as 0.4 miles of riparian habitat in Browns Canyon by emphasizing wildlife habitat management in this area. See Table 4-5 for comparisons of tortoise and riparian habitats protected in ACECs and WHAs by alternative.

Alternative C

Impacts to biological resources would be similar to those described for *Alternative B*, except as described below.

The allocation in Agua Fria National Monument of the Pronghorn Fawning Habitat WHA (16,810 acres) and the Pronghorn Movement Corridor WHA (22,520 acres) would do the following:

- limit or mitigate vehicular access to achieve DFCs,
- prohibit developing new recreational facilities,
- require in all fences meet BLM standards, and
- emphasize management of wildlife habitat, thereby reducing pronghorn habitat fragmentation and movement restrictions

In these managed areas, prescribed burns would improve pronghorn forage quality and reduce the abundance and spread of invasive species.

Allocating the Belmont/Big Horn Mountains WHA (77,730 acres) and Date Creek Mountains WHA (2,850 acres) would require the closure, limitation, or mitigation of motorized vehicle routes to reduce impacts to wildlife populations and habitat fragmentation. In the Belmont/Big

Horn Mountains, this allocation would also protect bighorn sheep and desert tortoise populations from habitat fragmentation and allow unrestricted movement and greater use of this habitat, maintaining genetic diversity and population health of bighorn sheep. Other management actions for these areas include (1) acquiring State and private lands and (2) prohibiting the building of new fences. These actions would protect and maintain Sonoran desertscrub vegetation communities by restricting land disturbance.

Allocating the Harquahala/Belmont/Big Horn WHA (140,790 acres) would have impacts on biological resources similar to those described for the Belmont/Big Horn Mountains WHA and would also ensure that the needs of bighorn sheep are given priority consideration during evaluation of any future road improvements.

Allocating the Upper Agua Fria River Basin Habitat Corridor WHA (9,907 acres) would benefit biological resources (1) by eliminating conflicts with vehicle routes that degrade wildlife habitat value and (2) by allowing pronghorn and mule deer to move between BLM lands and national forest lands by eliminating the building of new fences.

The designation of the WHAs would add additional protection to 6,520 acres of Category I desert tortoise habitat, 129,590 acres of Category II habitat and 7,840 acres of Category III habitat as well as 14.7 miles of riparian habitat by emphasizing wildlife habitat management in these areas. See Table 4-5 for comparisons of tortoise and riparian habitats protected in ACECs and WHAs by alternative.

Alternative D

Impacts to biological resources would be similar to those described for *Alternative B*, except as described below.

In Agua Fria National Monument impacts of allocating the Pronghorn Movement Corridor and the Pronghorn Fawning Habitat WHAs would be similar to those described for *Alternative C*, except that all fences would be removed in the absence of livestock grazing and substantial obstacles to movement would be eliminated.

Impacts of allocating Date Creek Mountains WHA would be similar to those described for *Alternative C*, except that all existing fences would be removed and mineral material and vegetation sales would be prohibited. These management actions would allow big game to move throughout the areas and would eliminate potential tortoise habitat destruction from mineral material sales.

Impacts of allocating the Upper Agua Fria River Basin Habitat Corridor WHA (21,443 acres) would be similar to those described for *Alternative C*, except that the management would be applied to a larger area and all fences would be removed, facilitating big game movement.

The designation of the WHAs would add additional protection to 2,850 acres of Category II habitat and 3,630 acres of Category III habitat as well as five miles of riparian habitat by emphasizing wildlife habitat management in these areas. See Table 4-5 for comparisons of tortoise and riparian habitats protected in ACECs and WHAs by alternative.

***Alternative E* (Preferred Alternative)**

Impacts to biological resources would be similar to those described for *Alternative B* except as described below.

Impacts of allocating the Pronghorn Movement Corridor WHA and the Pronghorn Fawning Habitat WHA would be similar to those described for *Alternative C*. *Alternative E* would prevent impacts to pronghorn during the fawning season from human activity resulting from special recreation use permits.

Impacts of allocating the Belmont/Big Horn Mountains WHA would be similar to those described for *Alternative C* for allocating Belmont/Big Horn Mountains WHA and the

Harquahala/Belmont/Big Horn Wildlife Corridor WHA.

The designation of the WHAs would add additional protection to 3,610 acres of Category I desert tortoise habitat, 129,340 acres of Category II habitat and 4,040 acres of Category III habitat as well as 14.7 miles of riparian habitat by emphasizing wildlife habitat management in these areas. See Table 4-5 for comparisons of tortoise and riparian habitats protected in ACECs and WHAs by alternative.

4.11.5 From Cultural Resource Management

***Alternative A* (No Action)**

Management actions for cultural resources that prohibit surface disturbance near known archaeological sites would protect vegetation and wildlife habitat in those areas.

Alternative B

In Agua Fria National Monument biological resources could be degraded by implementing High public use at four sites, if developed. However, if these site developments include visitor facilities with gravel parking areas, restrooms, and picnic facilities; vegetation loss and increased human activity could alter wildlife use of the area and lead to habitat loss and fragmentation. Any potential impacts to pronghorn or other biological resources in the national monument would be tempered by the requirement that management actions be consistent with the national monument proclamation (Appendix A). A portion of Black Mesa, along with the Badger Springs Wash area, is located in a pronghorn migration corridor. Public use of the sites could disturb the movements of the pronghorn. Impacts of developing four cultural sites to Moderate public use, including such improvements as hardened trails and signs, would be lower than developing them to High public use. No impacts are expected from Low public use developments.

In the Bradshaw-Harquahala Planning Area impacts would be similar to those described for the monument, but wildlife resources affected would depend on the site location, size, and surrounding habitat. Impacts would be reduced by the decision to manage desert tortoise habitat for no net loss in amount or quality. Descriptions of cultural use categories are included in Appendix E.

Alternative C

In Agua Fria National Monument biological resources could be degraded by implementing High public use at two sites, if developed. Impacts would be similar to those described for *Alternative B* but at fewer sites. Impacts from developing the eight Moderate public use sites described would be similar to those described for *Alternative B* but at more sites. Overall, development of public use sites is expected to have lower impacts than in *Alternative B*.

In the Bradshaw-Harquahala Planning Area impacts would be similar to those described for *Alternative B*, but in fewer locations.

Alternative D

Impacts from developing the two Moderate public use sites described would be similar to those described for *Alternative B* but at fewer sites. There would be no conflicts with pronghorn migration corridors.

In the Bradshaw-Harquahala Planning Area impacts would be similar to those described for *Alternative B*, but in fewer locations than in *Alternative C*.

***Alternative E* (Preferred Alternative)**

In Agua Fria National Monument biological resources could be degraded by implementing High public use at three sites, if developed. Impacts would be similar to those described for

Alternative B. Impacts from developing the four Moderate public use sites would be similar to those described for *Alternative B*. Excluding the two Black Mesa pueblos from public use would remove conflicts with pronghorn migration corridors. However, interpretive use of the Rollie site could constrain migration between the southern and northern portions of Black Mesa.

In the Bradshaw-Harquahala Planning Area impacts would be similar to those described for *Alternative B*.

4.11.6 From Paleontological Resource Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

There are no impacts to biological resources expected under any Alternative.

4.11.7 From Recreation Management

***Alternative A* (No Action)**

In the Agua Fria National Monument recreation uses would be allowed to the extent that they are consistent with the primary purpose of the monument to protect the objects identified in the proclamation.

In the Bradshaw-Harquahala Planning Area current levels of recreation management would inadequately protect biological resources. Informal concentrated recreational use areas would continue to develop and grow causing increasing levels of habitat loss and disturbance. The location and use of these areas would continue to be unplanned and may conflict with sensitive biological resources, priority species or priority habitats, including riparian areas and desert tortoise habitat.

Alternative B

In Agua Fria National Monument the allocation of 57,900 acres of Front Country and 300 acres of Passage RMZs would emphasize public recreation use. This use could encourage ground disturbance in and near recreation use areas and access roads, degrading vegetation and wildlife habitat. Additionally, both campgrounds proposed by *Alternative B* would be in pronghorn movement corridors. Human activity in these campgrounds could affect pronghorn behavior, reducing the value of fawning areas on Black Mesa and modifying pronghorn movement in the Bloody Basin Road area.

Allocating 12,700 acres of Back Country RMZ would emphasize natural primitive landscapes, resulting in limited access and less ground disturbance to vegetation and wildlife habitat.

In the Bradshaw-Harquahala Planning Area seasonally restricting motorized speed or timed events in Category I and II desert tortoise habitat would avoid impacts to desert tortoises from these types of activities.

Limiting designation of rock crawling areas to areas where biological values do not exist or could be mitigated would protect biological resources.

In the Table Mesa SRMA 20 acres allotted for OHV staging areas would destroy any remaining vegetation in these areas. In the Hieroglyphic Mountains SRMA, 30 acres allotted for OHV staging areas would destroy any remaining vegetation in these areas. In the Wickenburg SRMA, allotting 20 acres for OHV staging areas would destroy any remaining vegetation in these areas. In the San Domingo SRMA, allotting 10 acres for OHV staging areas would destroy any remaining vegetation in these areas.

Alternative C

Impacts to biological resources in Agua Fria National Monument would be similar to those under *Alternative B* except that visitor use impacts on the Front Country RMZ could affect 42,410 acres. The developed campground in the Badger Springs area would be in a narrow

portion of the pronghorn movement corridor, where human activity could affect pronghorn behavior, reducing the value of fawning areas on Black Mesa.

Impacts to biological resources in the Back Country RMZ would be similar to those described for *Alternative B*, except that the Back Country RMZ would be expanded to 28,420 acres.

Impacts to biological resources from allocating a Passage RMZ would be similar to those described for *Alternative B*, except that the Passage RMZ would occupy just 70 acres.

Within the Bradshaw-Harquahala, impacts from staging areas and route designations would be similar to those described for *Alternative B*, except the size of the disturbance and vegetation loss would be less.

Alternative D

Impacts to biological resources in Agua Fria National Monument would be similar to those under *Alternative B*, except that visitor use impacts of the Front Country RMZ would affect 1,530 acres. The national monument would have no developed campgrounds, decreasing possible impacts to pronghorn behavior in the pronghorn movement corridor.

Impacts to biological resources in the Back Country RMZ would be similar to those described for *Alternative B* except that the Back Country RMZ would be expanded to 68,380 acres.

Impacts to biological resources from allocating a Passage RMZ would be similar to those described for *Alternative B*, except that the Passage RMZ would consist of 990 acres.

Within the Bradshaw-Harquahala, impacts from staging areas and route designations would be similar to those described for *Alternative C*, except that the size of the disturbance and vegetation loss would be greater, especially in Castle Hot Springs SRMA.

Shifting uses in the Hieroglyphic Mountains SRMA from motorized to nonmotorized over the life of the plan would reduce habitat fragmentation and disturbance and the displacing of wildlife.

***Alternative E* (Preferred Alternative)**

Impacts to biological resources in Agua Fria National Monument would be similar to those under *Alternative B*, except that visitor use impacts of the Front Country RMZ would affect 12,440 acres. As in *Alternative D*, the national monument would have no developed campgrounds.

Impacts to biological resources in the Back Country RMZ would be similar to those described for *Alternative B* except that the Back Country RMZ would be 57,200 acres. Impacts to biological resources from allocating a Passage RMZ under *Alternative E* would be similar to those described for *Alternative B* except that the Passage RMZ would consist of 1,300 acres.

Within the Bradshaw-Harquahala, impacts from staging areas and route designations would be similar to those described for *Alternative C*.

4.11.8 From Visual Resource Management

***Alternative A* (No Action)**

In the Lower Gila North MFP (BLM 1983) area, impacts to biological resources from designating areas as VRM Class I will influence the design and location of wildlife management developments, including water facilities, by requiring that the level of change from the characteristic landscape be very low and not attract attention from key observation points. Some types of habitat developments may be precluded at some locations depending on design and site characteristics. This allocation may also limit or preclude some types of developments that could destroy habitat or adversely affect wildlife populations. VRM

Class I for the entire planning area is allocated only within designated wilderness areas and equals 96,820 acres. The Phoenix RMP (BLM 1988a) area has no VRM classification except where designated wilderness is VRM Class I.

In the absence of VRM allocations, implementation actions use VRM Class III standards. VRM Class III would allow wildlife related developments to attract the attention but not dominate the view of the casual observer. Though efforts would be made to minimize the visual impacts of wildlife related developments, few limitations would be likely imposed on placement or design.

Alternative B

Impacts to biological resources would be similar to those under *Alternative A*, except that the area in VRM Class I would be 96,820 acres and VRM Class II would be allocated to 486,800 acres.

Similar to the VRM Class I description in *Alternative A*, VRM Class II will influence the design and location of wildlife management developments, except that they should not attract the attention of the casual observer from key observation points.

Alternative C

Impacts to biological resources would be similar to those under *Alternative B*, except that the area in VRM Class I would increase to 109,570 acres and the area in VRM Class II would increase to 502,610 acres.

Alternative D

Impacts to biological resources would be similar to those under *Alternative B*, except that the area in VRM Class I would decrease to 298,310 acres and the area in VRM Class II would decrease to 340,880 acres.

***Alternative E* (Preferred Alternative)**

Impacts would be similar to those described for *Alternative B*, except that the area in VRM Class I would increase to 98,820 acres and the area in VRM Class II would increase to 488,250 acres.

4.11.9 From Rangeland Management

***Alternative A* (No Action)**

Prohibiting livestock grazing in Larry Canyon ACEC in Agua Fria National Monument would not affect biological resources because the ACEC is inaccessible to cattle. Adhering to the *Rangeland Health Standards* would benefit biological resources by doing the following:

- reducing soil erosion,
- restoring and maintaining the functional condition of riparian habitats, and
- ensuring that progress is made toward desired plant communities in both riparian and upland areas, including reducing the presence of invasive species.

Implementing these standards would prioritize the habitat needs of special status species, where wildlife and other land uses conflict. Implementing changes in grazing practices and management systems as a result of the *Rangeland Health Standards* would also increase vegetation density and cover, which provide forage and cover for wildlife.

Modifying all fences to facilitate big game movement would benefit biological resources by allowing unimpeded movement of pronghorn and other game between seasonal use areas.

Developing new range water sources might benefit biological resources by making usable some habitat that would not otherwise be suitable because of a lack of water. Some wildlife might expand or increase as a result of the increased water availability. However, the presence of range waters might alter the behavior of some wildlife species, populations, or individuals. Wildlife might become

dependent on these water sources and be adversely affected if the water source is not maintained. While designed to be wildlife friendly, range water sources can result in mortality to some small mammals and birds, which can become trapped in troughs and storage tanks not designed or maintained to BLM's standards.

Range waters might also be a potential source of disease transmission to some game species. These waters tend to concentrate livestock use and result in over-utilization of vegetation and soil alterations in the area of influence, generally within a half mile of the water source.

Habitat alteration resulting from concentrated use can reduce forage availability for some wildlife, including desert tortoise and mule deer. Range waters and their resulting concentrations of livestock can attract cowbirds, which are nest parasites on many native songbirds, including the endangered southwestern willow flycatcher.

Alternative B

Impacts from adhering to the *Rangeland Health Standards* would be the same as in *Alternative A.*

Implementing ephemeral allotment designations when warranted would eliminate year-long livestock use of perennial shrubs and trees in Sonoran desertscrub vegetation communities, where precipitation and vegetation production are low. The absence of perennial use would likely increase native grass production, shrub and tree cover, and habitat complexity essential for many small mammals and birds.

Allowing the consideration of allotment retirement when lands are devoted to other public purposes could increase plant species diversity and wildlife habitat complexity in areas of implementation.

In Agua Fria National Monument limiting livestock grazing in riparian areas to winter only (November 1 to March 1), implemented through the allotment evaluation process, would do the following:

- ensure recruitment and survival of cottonwood, willow, ash, and sycamore trees;
- reduce livestock loafing along creek bottoms, which degrades streambanks and alters channel morphology, thereby increasing the channel width-depth ratio and creating a deeper channel with more pools;
- allow the accumulation of vegetation in the herbaceous layer that protects the natural function of streams.

These effects would increase the diversity and abundance of plant species and the complexity of the wildlife habitat, benefiting a number of wildlife species, including endangered fishes and migratory birds.

In the Bradshaw-Harquahala Planning Area, implementing riparian management through the allotment evaluation process would have effects on biological resources similar to those described for Agua Fria National Monument, except that impacts would occur more slowly and management techniques could vary.

Impacts from water developments and fences would be the same as those described in *Alternative A.*

Alternative C

In Agua Fria National Monument impacts to biological resources from closing all riparian pastures to livestock grazing would be similar to those described for *Alternative B* for the winter season of use, except that the vegetation and stream channel response would likely be more pronounced and occur more quickly due to the lack of vegetation utilization and trampling. Upland areas in riparian pastures would likely respond to the absence of livestock grazing by increasing vegetation ground cover and litter. Wildlife forage would increase because livestock would remove no annual production. Individual plants would not be hedged. Most

plants would produce more seeds and accumulate decadent material and litter in the absence of livestock utilization. This accumulation of vegetation material would increase wildlife habitat diversity and abundance, which in turn would result in increases in populations of wildlife depending upon vegetation cover.

In the Bradshaw-Harquahala Planning Area impacts to biological resources would be similar to those described for Agua Fria National Monument.

Closing the Harquahala Mountains ONA ACEC to livestock grazing during bighorn sheep lambing season (January 1 – April 1) would increase wildlife forage quality and availability and eliminate competition between bighorn sheep and livestock for forage during the critical lambing season. These benefits should increase lamb fitness and survival.

Prohibiting the developing of facilities that would increase livestock use in Browns Canyon and the Inner Basin would eliminate concentrated livestock use from sensitive riparian and upland habitat areas.

Impacts from water developments and fences would be the same as those described in *Alternative A.*

Alternative D

The affects of removing all livestock from Federal lands in both planning areas would be similar to those described for riparian and upland areas under *Alternative C*. However, *Alternative D* would affect a much larger area.

Eliminating all range improvements that serve no purpose in the absence of livestock grazing would remove many fences and corrals that hinder natural movement of pronghorn, mule deer, and bighorn sheep.

Impacts from water developments would be greatly reduced due to the limitations and restrictions on grazing. Facilities that are not needed for other management purposes or are creating negative impacts would be removed.

***Alternative E* (Preferred Alternative)**

Alternative E would have impacts similar to those described for *Alternative B*.

4.11.10 From Minerals Management

***Alternative A* (No Action)**

Agua Fria National Monument is closed to new mineral entry. This closure removes the threat of vegetation clearing, habitat loss, and exotic plant introduction that could occur as a result of mining.

In the Bradshaw-Harquahala Planning Area minerals actions would be evaluated on a case-by-case basis and impacts to biological resources would be mitigated and avoided to the extent allowable by regulation. Some residual loss of desert tortoise habitat is likely as a result of mining conducted under the 3809 regulations. This unmitigated loss is expected to be relatively small.

Alternative B

In Agua Fria National Monument impacts to biological resources would be similar to those described for *Alternative A*.

Closing Tule Creek ACEC to mineral entry, mineral leasing, geothermal leasing, and mineral material disposal would reduce ground disturbances and impacts to vegetation and wildlife habitat, including habitat for the endangered Gila topminnow and desert tortoise.

Closing the Hassayampa “Box” area to mineral entry would reduce ground disturbance and impacts to vegetation and wildlife habitat, including priority riparian habitat.

Opening reconveyed lands to mineral entry could result in mining and mineral material sales in areas now closed. Mining could disturb priority habitats, including riparian areas and desert tortoise habitat, and could degrade the value of these habitats to wildlife.

Alternative C

In Agua Fria National Monument impacts to biological resources would be similar to those described for *Alternative A*.

Impacts to biological resources in Tule Creek ACEC would be similar to those described for *Alternative B*.

Closing Sheep Mountain RNA ACEC to mineral entry would reduce the potential for ground disturbance and mining-related impacts to vegetation and wildlife habitat, including desert tortoise habitat.

Closing the Harquahala Mountains ONA ACEC to mineral entry would reduce the potential for ground disturbance and mining-related impacts to vegetation, spring sources, and wildlife habitat, including desert tortoise and bighorn sheep habitat.

Opening reconveyed lands with high mineral potential to mineral entry could result in mining and mineral material sales in areas now closed to those activities. Mining could disturb priority habitat, including that of desert tortoises. Priority riparian habitat on reconveyed lands would be protected from mining disturbances.

Alternative D

In Agua Fria National Monument impacts to biological resources would be similar to those described for *Alternative A*.

Keeping reconveyed lands closed to mineral entry would protect from mining disturbances priority wildlife habitats, including riparian areas and desert tortoise habitat.

Impacts to biological resources in Tule Creek ACEC would be similar to those described for *Alternative B*.

Impacts to biological resources from closing the Harquahala Mountains ONA ACEC, Baldy Mountain ONA ACEC, and Sheep Mountain RNA ACEC to mineral entry would be similar to those described for *Alternative C*.

Impacts to biological resources from closing the Belmont-Big Horn ACEC to mineral material disposal and leasing would be similar to those described for *Alternative B* for the lands allocated to maintain or enhance wilderness characteristics.

***Alternative E* (Preferred Alternative)**

In Agua Fria National Monument impacts to biological resources would be similar to those described for *Alternative A*.

Impacts to biological resources in Tule Creek ACEC and other areas closed to mineral development would be similar to those described for *Alternative B*.

Impacts to biological resources from management of reconveyed lands would be similar to those described for *Alternative C*.

4.11.11 From Fire Management

***Alternative A* (No Action)**

The use of prescribed fire in Agua Fria National Monument would particularly affect pronghorn habitats by doing the following:

- removing old, woody vegetation,
- promoting the growth of healthy new plants for forage,
- eliminating shrubs that allow predators to ambush pronghorn,
- increasing the quality of fawn hiding cover, and

- helping control or potentially eliminate invasive species and restore the natural fire cycle.

Full wildland fire suppression of naturally set fires in the national monument could interrupt the natural fire cycle required for proper successional development of plant communities. Suppression of natural fires can promote the growth of invasive or exotic species and allow a buildup of the existing fuel load.

Full suppression of all fires in the Bradshaw-Harquahala Planning Area would have the same impacts to fire-adapted communities (grassland and chaparral) as those shown above.

Full suppression of fires in Sonoran desertscrub habitat in the Bradshaw-Harquahala Planning Area would affect vegetation and wildlife by decreasing mortality to species not adapted to fire.

***Alternatives B, C, D,* and *E* (No Action)**

Vegetation and wildlife (particularly pronghorn antelope) would benefit from prescribed burning and mechanical treatment of the vegetation in the planning areas. Impacts would include a temporary reduction in the availability of forage. Over the long term these treatments would do the following:

- eliminate invasive species,
- reduce the fuel load, and
- improve and maintain the species diversity of perennial grasses and forbs.

The treatments would also reduce the population size of invasive species in fire-adapted environments throughout the planning areas, reducing competition between invasive species and native vegetation for available space, nutrients, and water.

Allowing natural fire starts to burn when conditions are suitable would allow the natural fire cycle to occur in fire-adapted grassland and chaparral plant communities. These fires would create a natural mosaic of vegetation of different successional stages as well as improve forage and reduce hazardous fuels.

Full suppression of fires in Sonoran desertscrub habitat in the Bradshaw-Harquahala Planning Area would have the same impacts as described in *Alternative A.*

4.11.12 From Wild Horse and Burro Management

***Alternative A* (No Action)**

No impacts are expected in Agua Fria National Monument.

In the Harquahala Herd Area (HA), concentrated burro use of sensitive habitats, especially in Browns Canyon in the Harquahala Mountains, would continue to cause degradation of those habitats and increase competition between wildlife species and burros for limited forage and water resources. Maintaining the burro herd within the 80,800-acre Lake Pleasant Herd Management Area (HMA) at the Appropriate Management Level (AML) determined in the Lake Pleasant Herd Management Plan will minimize competition between burros, wildlife, and livestock.

Alternative B

Impacts are the same as in *Alternative A.*

Alternatives C* and *D

By eliminating the burro population in the Harquahala HA, sensitive habitats where burros now concentrate will begin to recover and mule deer and bighorn sheep would not compete with burros for forage, water, or other habitat.

Impacts in the Lake Pleasant HMA are the same as in *Alternative A.*

***Alternative E* (Preferred Alternative)**

Removing nuisance burros and burros impairing sensitive habitats would result in impacts similar to those described for *Alternatives C* and *D*.

Impacts in the Lake Pleasant HMA are the same as in *Alternative A*.

4.11.13 From Management of Transportation and Public Access

***Alternative A* (No Action)**

In Agua Fria National Monument, biological resources would benefit from prohibiting cross-country OHV use, which would prevent the destruction of vegetation and priority wildlife habitats and habitats for priority species.

In the Bradshaw-Harquahala, prohibiting cross-country OHV use in the management area covered by the Phoenix Resource Management Plan (BLM 1988a) would provide some protection for sensitive desert tortoise habitat but plan language makes enforcement difficult due to the lack of route designation or signing. Vehicle use of routes that degrade the value of sensitive riparian and tortoise habitat would likely continue and increase. Allowing cross-country OHV use in the area covered by the existing Lower Gila North Management Framework Plan (BLM 1983) would harm vegetation and wildlife by increasing the incidence of habitat destruction and by degrading cover and forage. Open OHV use could cause the loss of priority habitat and habitat for priority species, including desert tortoise.

Route proliferation would likely continue as a result of not designating open routes. Habitat loss and fragmentation would likely continue to increase with time. Human disturbance to wildlife populations in more remote areas would likely increase as more vehicle routes are established.

Alternative B

Designating 140 miles of road as open and closing 38 miles in the Agua Fria National Monument would reduce habitat fragmentation and human disturbance to priority habitat and priority species, including riparian and pronghorn habitats. Closed roads would reclaim and restore habitat.

In the Bradshaw-Harquahala Planning Area, designating vehicle routes and closing undesignated routes and cross-country travel would benefit biological resources by reducing (1) habitat fragmentation, (2) vegetation destruction, and (3) human disturbance of wildlife.

Alternative C

Impacts in Agua Fria National Monument would be similar to those described for *Alternative B* except that 129 miles of roads would remain open, providing less habitat fragmentation.

Alternative D

Impacts in Agua Fria National Monument would be similar to those described for *Alternative B*, except that 47 miles of roads would remain open, fragmenting even less habitat than under *Alternative C*.

***Alternative E* (Preferred Alternative)**

Impacts in Agua Fria National Monument would be similar to those described for *Alternative B* except that 101 miles of roads under *Alternative E* would fragment fewer habitats than would *Alternative C* but more than would *Alternative D*.

4.11.14 From Management of Wilderness Characteristics

***Alternative A* (No Action)**

There would be no impacts to biological resources because there are no areas managed for wilderness characteristics in this Alternative.

Alternative B

In both management areas, allocations to maintain or enhance wilderness characteristics would recognize wildlife populations and habitat as important aspects of naturalness and actively manage them. Such management would minimize impacts to wildlife. Allocating 56,040 acres to maintain or enhance wilderness characteristics in the Harquahala Management Unit, along with restrictions to roads and vehicles, would reduce disturbances to priority wildlife habitats.

Closing lands allocated to maintain or enhance wilderness characteristics to mineral material disposal would reduce ground disturbance and impacts to vegetation and wildlife habitat.

Alternative C

Impacts would be similar to *Alternative B*, except that allocating 107,510 acres to maintain or enhance wilderness characteristics in 3 management units, along with restrictions to roads and vehicles, would further reduce disturbances to priority wildlife habitats.

Alternative D

Impacts would be similar to *Alternative C*, except 91,480 acres would be allocated to maintain or enhance wilderness characteristics.

***Alternative E* (Preferred Alternative)**

Impacts would be similar to *Alternative C*, except 96,420 acres would be allocated to maintain or enhance wilderness characteristics.

4.12 Impacts on Cultural Resources

The projected impacts on cultural resources relate to three main issues:

- resource protection
- scientific research, and
- public education and interpretation.

These issues reflect the informational, heritage, and educational values that are attributed to archaeological sites and places of traditional cultural importance. These values are correlated with allocations to scientific, traditional, and public uses.

Protecting significant cultural resources is an overarching goal of all of the Alternatives, as well as a directive that is accorded special emphasis in Agua Fria National Monument. In addition, because the significance of an archaeological or historical site may be closely related to its scientific research potential, the consequences of implementing the Alternatives on current and future research opportunities need to be determined. Finally, even though no stipulations were made in the Agua Fria National Monument Proclamation (Appendix A) for public use, some degree of onsite public education and interpretation is considered desirable, though not to the detriment of the cultural resources that Agua Fria National Monument was created to protect. In the Bradshaw-Harquahala Planning Area, demand is also increasing for opportunities for cultural heritage tourism.

The Alternatives discussed in Chapter 2 differ mainly in the proposed number of sites and priority management areas that would be allocated to public use. The No-Action Alternative (*Alternative A*) corresponds to the current management plans for both of the planning areas. The action Alternatives

represent differing intensities of public use, ranging from relatively High (*Alternative B*) to Moderate (*Alternative C*) to Low (*Alternative D*). Selected archaeological sites would be made available for increased public visitation and interpretation under *Alternatives B* and *C*. Most cultural resources would be excluded from public use under *Alternative D*. Generally, the greater the public use is expected to be, the greater the potential for cultural resource damage. However, increased use also provides greater opportunities for public education and promotion of responsible stewardship.

4.12.1 From Special Area Designations

***Alternative A* (No Action)**

Cultural resource inventories, such as those described in section 3.6, would continue throughout the planning areas in each Alternative. These studies are nonintrusive and have no noticeable affect on the locations in which they are conducted.

Cultural resources represent one of the outstanding values for which the Agua Fria River was recommended as suitable for wild and scenic river designation. BLM guidance mandates the protection of these values. Actions implemented to protect wildlife habitat and scenic values, which are also regarded as outstanding, are also likely help to preserve the integrity of cultural resources in the river corridor. For example, the closure of Badger Springs Wash to vehicles has helped to protect the integrity of the Badger Springs petroglyph site.

Within designated Wilderness Areas, prohibitions of motorized and mechanized use, as well as restrictions on development will continue to preserve cultural resources in their current condition.

Alternative B

No impacts are expected from removing the Perry Mesa and Larry Canyon ACEC designations because the monument proclamation (Appendix A) provides a higher level of protection for cultural resources across a more extensive landscape.

An increased number of users resulting from Back Country byway designations would likely affect cultural resources along Bloody Basin and Constellation Mine Roads. Potential impacts include the possibility of increased vandalism and accelerated erosion at roadside sites. Increases in traffic could create a need for more frequent maintenance or stabilization to preserve the historical masonry features of Constellation Road. Other effects include greater opportunities for public education and cultural heritage tourism.

Designating Tule Creek ACEC would help protect cultural resources by restricting motorized access and eliminating grazing from fenced areas. These actions would limit surface disturbances that could damage archaeological features.

Alternative C

Impacts from designating Bloody Basin and Constellation Mine Roads as Back Country byways would be similar to those discussed for *Alternative B*.

Among the special designation areas described for *Alternative C*, the Black Mesa, Tule Creek, Black Butte, and Harquahala Mountains ACECs are known to contain significant cultural resources. These and other proposed ACEC designations would include restrictions on transportation routes, rights-of-way, livestock grazing, and minerals actions. Such restrictions would help protect cultural resources by limiting public access and ground-disturbing activities. The management prescriptions for the Black Butte ACEC allow for restricting activities that might threaten the integrity of the Vulture obsidian source, an important cultural resource.

Alternative D

Because *Alternative D* proposes no Back Country byways, no impacts to cultural resources are expected.

ACEC designations would have similar impacts to those discussed for *Alternative C*. Designating more ACECs would further restrict motorized access and other land uses, thereby better protecting cultural resources.

Alternative E (*Preferred Alternative*)

Impacts from designating Bloody Basin and Constellation Mine Roads as Back Country byways would be similar to those discussed for *Alternative B*.

ACEC designations would have impacts similar to those discussed for *Alternative C*. Rather than being designated as an ACEC, the Black Mesa area would be nominated to the National Register of Historic Places as the Black Mesa Rim Archaeological District. Cultural resources would be protected by management actions identified as common to all Alternatives for the Black Mesa/Bumble Bee priority area in section 2.7.3.6. These actions include road closures, fencing to exclude livestock from sites, signing, and frequent monitoring.

This area would also be excluded from public use except for a current special recreation permit that focuses on approved site recording and educational activities. ACEC status would provide limited added protection to the area. A National Register listing would underscore the cultural importance of the area in support of BLM's efforts to protect it through a partnership. The Black Mesa Rim Archaeological District would be next to, as well as complementary to the Perry Mesa National Register District.

4.12.2 From Lands and Realty Management

***Alternative A* (No Action)**

Land acquisitions allowed under current management guidelines could approve acquiring significant archaeological sites in and around Agua Fria National Monument, thereby enhancing values that the national monument was created to protect. Added protection afforded to cultural resources under BLM's management, such as applying the Archaeological Resources Protection Act (ARPA), would also help ensure that sites are available for future scientific or public uses. Land acquisitions could also secure places of traditional cultural importance that could be managed to protect traditional uses or heritage values.

Installing new above-ground utilities in the existing right-of-way corridor would degrade the physical integrity and visual setting of Agua Fria National Monument's natural and cultural landscape.

Disposal of lands in the Upper Agua Fria River basin might remove significant cultural resources from Federal protection**.** Conversely, acquiring lands in the Black Canyon and Lake Pleasant RCAs would likely increase the level of protection now given cultural resources on non-Federal lands.

The disposal of 54,370 acres of BLM-managed land in the Bradshaw-Harquahala Planning Area could potentially place cultural sites at risk, though individual parcels would be evaluated on a case-by-case basis. However, most parcels are small, isolated, and near current or future urban growth areas where the potential for cultural vandalism is increasing. However, before parcels are disposed of, cultural survey is conducted and the significance of cultural resources found can be a reason to halt the disposal. Therefore, acquiring State and private lands would likely increase the level of protection for cultural resources on those lands.

Alternative B

Non-Federal land acquisitions in and next to Agua Fria National Monument would have

similar impacts to those discussed for *Alternative A*.

Restrictions on new utility or transportation corridors or telecommunication site areas in Agua Fria National Monument would eliminate any ground disturbance or visual intrusions that could damage the physical integrity or visual setting of cultural resources.

Acquiring or disposing of lands in the Bradshaw-Harquahala Planning Area might add or remove significant cultural resources from Federal protection. Impacts would be assessed on a case-by-case basis once specific parcels have been selected. Disposal impacts would be similar to *Alternative A*, except 58,400 acres would be available for disposal.

Widening the Black Canyon utility corridor, and creating new electric and gas corridors in the Bradshaw-Harquahala Planning Area could disturb cultural resources in designated areas. Construction activities and access requirements might threaten disturbance of archaeological sites in new right-of-way corridors or along new access roads. Installing above-ground utilities might detract from the visual integrity of site settings.

On the other hand, establishing specific corridors encourages project applicants to place utility lines in certain confined areas, which helps to confine cultural resource impacts. In these corridors, BLM would work with applicants to develop route and project design Alternatives that emphasize avoidance of impacts to cultural resources. Treatment plans would specify avoidance requirements or other actions such as scientific data recovery or aerial installation of power lines to mitigate adverse impacts should avoidance be infeasible.

Alternative C

Non-Federal land acquisitions in and next to Agua Fria National Monument would have similar impacts to those discussed for *Alternative A*.

Eliminating the Black Canyon utility corridor from Agua Fria National Monument would reduce the likelihood that cultural resources would be affected by ground disturbance or visual intrusions from future utility development.

Widening the Black Canyon utility corridor to the west and creating new electric and gas corridors in the Bradshaw-Harquahala Planning Area could have impacts to cultural resources similar to those discussed for *Alternative B*.

Impacts of land disposal and acquisition in the Bradshaw-Harquahala Planning Area would be similar to *Alternative A*, except the disposal of 600 acres, as identified under method one, is not likely to significantly affect cultural resources. The disposal of 49,100 acres, as delineated through method two, could potentially place cultural sites at risk as in *Alternative A*.

Alternative D

Non-Federal land acquisitions in and next to Agua Fria National Monument would have similar impacts to those discussed for *Alternative A*.

Eliminating the Black Canyon utility corridor from Agua Fria National Monument would have impacts similar to those discussed for *Alternative C*.

Acquiring State and Federal lands in the Bradshaw-Harquahala Planning Area would likely increase the level of protection for cultural resources on those lands, similar to *Alternative C*. Under this Alternative, no lands would be available for disposal and so no impacts would be expected.

***Alternative E* (Preferred Alternative)**

Non-Federal land acquisitions in and next to Agua Fria National Monument would have similar impacts to those discussed for *Alternative A*.

Projected impacts to cultural resources in Agua Fria National Monument would be similar to those described for *Alternative C*.

Projected impacts to cultural resources in the Bradshaw-Harquahala Planning Area would be similar to those described for *Alternative B*. Lands available for disposal would total 38,755 acres.

4.12.3 From Management of Soil, Air, and Water Resources

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

Where BLM implements measures that improve soil stability and vegetation cover, cultural resources are expected to be better protected from soil erosion.

4.12.4 From Biological Resource Management

***Alternative A* (No Action)**

Modifying existing fences in Agua Fria National Monument to allow wildlife movement would have little effect on cultural resources. New fences could disturb sites or detract from the visual setting of the primitive landscape.

Restricting public access in sensitive wildlife habitats would likely help protect cultural resources in those areas (e.g. Harquahala Mountains, Vulture Mountains).

Alternative B

There are no impacts expected from removing Larry Canyon ACEC (designated mainly to protect biological resources) because the monument proclamation (Appendix A) provides a higher level of protection for cultural resources across a more extensive landscape.

In general, actions implemented to protect wildlife habitats would support the protection of cultural resources by restricting ground-disturbing activities. Building new water sources could disturb surface artifacts and features, as well as subsurface archaeological deposits. Surveys would be conducted to find and avoid archaeological sites or mitigate disturbance to them from new water sources.

Ensuring connectivity of habitats for wildlife, through such actions as seasonal restrictions on travel and other activities in wildlife migration corridors, could limit access to cultural resources and restrict opportunities for archaeological research and cultural heritage tourism.

***Alternatives C, D,* and *E* (Preferred Alternative)**

Limiting vehicle routes in pronghorn corridors might restrict access to cultural resources, which would protect sites from human intrusions, but limit opportunities for scientific research, site monitoring, and interpretive development.

Impacts of modifying fences in Agua Fria National Monument would be similar to *Alternative A*.

Closing or limiting vehicle routes in sensitive wildlife habitats in the Bradshaw-Harquahala Planning Area should help protect cultural resources by restricting public access that could contribute to intentional or inadvertent damage. Each Alternative varies the number of vehicle routes limited or closed, as described in Appendix N. Generally, the more routes closed or limited would result in more protection of cultural resources.

4.12.5 From Cultural Resource Management

***Alternative A* (No Action)**

Restrictions on surface disturbances in Agua Fria National Monument following current interim guidelines would help protect cultural

resources but could limit archaeological research opportunities, as well as the compiling of related information useful for public education and interpretive development.

BLM would continue to implement actions to monitor, document, and protect significant cultural resources in both planning areas. Existing management guidance for the Bradshaw-Harquahala Planning Area emphasizes compliance with Section 106 of the National Historic Preservation Act (NHPA) as described in section 2.7.1.5. Proposed authorizations or actions that may impact cultural resources would be required to implement treatment plans for avoiding or mitigating adverse effects. Such actions are generally funded by the project applicants or by the BLM's programs that initiate them, rather than by the cultural heritage program. Impacts from management of cultural resources would be minimal.

Alternative B

Under all action Alternatives, BLM's Phoenix Field Office (PFO) would continue to implement the highest Section 106 workload among all BLM's offices in Arizona. Each action Alternative places a greater degree of emphasis on proactive management actions carried out in accordance with Section 110 of the NHPA, which mandates identifying and protecting archaeological, historical, and cultural values; whether or not they might be affected by proposed undertakings. Inventory, protection, documentation, and monitoring projects would be described for annual work and strategic plans. This proactive approach would result in an increase in the knowledge collected from and about cultural resources in the area. Long term preservation of cultural resources and the information they can contribute depends on knowing what kinds of sites there are and where they are located. In addition, the proactive approach contained in the Alternatives will improve public enjoyment of the cultural resources in the planning areas, leading to improved recreational experiences and a heightened awareness of the sensitivity of these resources.

In the Bradshaw-Harquahala Planning Area proactive management actions would be directed mainly toward eight sites in Special Cultural Resource Management Areas. These areas contain particularly important sites that are most at risk of damage from human activities or natural processes. However, this management focus would not exclude implementing necessary protective actions at sites outside the Special Cultural Resource Management Areas.

Archaeological inventories (surveys), a proposed ethno-historic study of Native American values in Agua Fria National Monument, and ongoing tribal consultations would identify significant resources and provide information critical for implementing protection and monitoring. This information would also support allocations of sites to use categories, allowing for traditional uses, access needs, or protective measures that might be important to tribes.

Physical and administrative measures implemented to protect cultural resources would help to stop, limit, or repair damage from vandalism, erosion, and other disturbances. Signs placed to inform the public about prohibitions under the ARPA and other laws would help protect threatened sites by providing relevant information and an alert that the sites are being monitored. If vandals damage a signed site, they would be less likely to claim ignorance of the prohibitions on illegal activities and to use this argument in legal defense of their actions. Signs would be installed so as not to draw undue attention to sites.

Threats to cultural resources would be reduced by frequent and systematic monitoring of sites by BLM's staff and volunteers; in addition, to restricting information about the locations of archaeological sites that are not allocated for public use.

In the Bradshaw-Harquahala Planning Area greater emphasis would be placed on regular monitoring of compliance, with stipulations

developed to protect cultural resources in R&PP Act leases and patents.

Archaeological and historical research projects would be consistent with scientific use allocations. Scientific research would contribute significantly to local and regional knowledge of human prehistory and history. Research would also allow for training students and volunteers who need to enhance their field and analytical skills. Research would offer opportunities for developing new techniques in rock art recording and other areas. The information gained through research projects would be useful, not only for scientists and students, but also for public education and interpretive planning.

Noninvasive methods of research and site documentation, such as surveying, mapping, photography, and remote sensing, would have little effect on cultural resources beyond a temporary increase in foot traffic and footprints. Collecting samples of artifacts from the site surface would affect site integrity by removing a small portion of the site. At sites that receive a relatively high number of visitors, well-documented collections would preserve rare or important artifacts (i.e. painted pottery or projectile points) that are particularly vulnerable to loss through casual collection.

Scientific excavations would disturb cultural deposits and could disturb buried human remains and associated items. Excavations could provide important data as no other means could. To limit undue disturbances, the highest priority for research projects would be assigned to sites threatened by vandalism or other types of disturbance, as well as sites determined to be suitable for interpretive development. BLM would require proper research designs and permits. In Agua Fria National Monument research plans would be required to ensure that most architectural features and cultural deposits would remain intact at habitation sites with multiple rooms.

Scientific research would be limited to noninvasive methods at sites allocated to "conservation for future use" in the Agua Fria National Monument backcountry, south of Perry Tank Canyon. These remote sites would be protected from surface disturbances resulting from investigations.

Scientific uses (research) could conflict with traditional uses (cultural heritage values). Many Native Americans might object to research at sites that are not threatened by imminent damage. In approving research designs, BLM would seek to avoid the disturbance or removal of Native American human remains and associated items and would include stipulations to that effect. Tribes would be allowed to participate in research projects, which would benefit from their cultural perspectives. Other benefits could include enhanced knowledge of tribal history and the opportunity to include Native American perspectives in interpretive planning.

Public education, whether through onsite interpretive development or offsite programs, would increase public understanding of the multiple values and irreplaceable nature of cultural resources. Benefits would be derived through public enjoyment and enhanced knowledge, as well as greater support for the protection and responsible stewardship of these resources. Such efforts would fulfill public education mandates under the NHPA and the ARPA.

Establishing partnerships with universities, museums, nonprofit archaeological and historic preservation organizations, government agencies, tribes, and community groups would enhance opportunities for cost sharing and public participation in monitoring, protection, research, and education.

Under all Alternatives for both planning areas, specific sites would be allocated to public use to allow visitors to enjoy, appreciate, and learn about cultural resources. Interpretive efforts would be coordinated with the recreation program staff and, where suitable, with cultural heritage tourism programs managed by local communities and Government agencies. Efforts would be made to develop public use

opportunities at accessible sites near such recreational facilities as public parks, back country byways, and hiking trails.

Public use of archaeological sites entails potential problems as well as benefits. Prehistoric and historic sites hold great fascination for many people, and there is a high public demand for opportunities to visit and learn about these sites. Cultural heritage tourism is one of the fastest growing sectors of Arizona's tourism industry, which is the second largest industry in the State. Opportunities to visit cultural sites allow people to enjoy these resources and to learn about prehistoric people, archaeology, history, Native American cultures, cultural values, scientific methods, and the interrelationships between people and the natural environments in which they lived. Agua Fria National Monument offers particularly compelling opportunities to view ancient sites in an undisturbed setting that strongly evokes a feeling of traveling back in time. Public use also provides an excellent opportunity to convey a sense of common heritage with the shared responsibility of stewardship.

Public use and interpretive development of cultural resources also can economically benefit local communities. For Arizona's BLM as a whole, the magnitude of this economic contribution can roughly be estimated by multiplying the overall daily spending average for cultural heritage tourists of $118 per day by the number of visitor days recorded in BLM's Recreation Management Information System (RMIS). RMIS contains visitor use data for 31 cultural heritage sites and areas administered by BLM in Arizona. In Fiscal Year 1999, site records show a total of 9,616 visitor days. Multiplying the total visitor days by the average daily spending rate results in an estimated annual economic contribution of $1,134,688. Cultural heritage tourism at BLM's sites in both planning areas could contribute several hundred thousand dollars annually to the economies of Maricopa and Yavapai Counties.

Sites that are developed and publicized for public use are undoubtedly exposed to visitor-caused damage from surface disturbance and erosion, destabilization of standing walls, other damage to structures and features, trash dumping, multiple trailing, and theft of artifacts. Additionally, visitors tend to alter the spatial distributions of artifacts by picking them up and depositing them into piles. Rock art could be damaged by climbing, which dislodges boulders; touching or applying foreign substances, such as chalk; painted or pecked graffiti; or theft. The presence of responsible visitors would likely discourage major incidents of vandalism or theft by others, but it would be difficult to halt the cumulative effects of small-scale removal of a few artifacts at a time.

BLM would use site-selection criteria and protective measures to mitigate the impacts of public use. Most sites that are allocated to public use would be accessible sites that are already well known and visited by the public. Without BLM's authorization many of these sites have been publicized in newspapers, magazines, books, and websites. Remote, undisturbed sites would not be allocated to public use. Sites considered for public use would be evaluated as to the feasibility of treating or stabilizing selected areas to withstand visitation, for example, by building foot trails to confine and direct traffic through sites.

Site mapping and documentation would be implemented to obtain scientific data and the information needed to develop protective measures and an interpretive plan. For example, architectural mapping and rock art documentation would preserve information that could be lost through damage. Documentation would also provide a baseline condition assessment for monitoring and managing changes resulting from visitor use over time. All public use sites would be systematically monitored to evaluate any changes resulting from visitation. Ongoing damage could lead to use restrictions, new protective measures, or suspension of the site's public use status.

Not all public use sites would be open to commercial tours. Applications for special recreation permits would be evaluated on a case-

by-case basis. Commercial tour operators would be required to adhere to site-specific stipulations, for example, that could restrict access to certain areas or limit the sizes of tour groups. They would be required to help monitor damage to the sites. In developing stipulations for commercial tours, BLM would consider adopting measures implemented by Coconino National Forest to manage tour operators to archaeological sites in the Sedona area.

Sizes of tour groups, whether led by commercial operators, nonprofit organizations, or BLM, would be limited to 25 people at a time on a single site. Larger groups are difficult to monitor and manage and thus pose a greater threat of damage.

Requiring that holders of special recreation permits provide site visitors with educational information on archaeological site preservation would help disseminate information on the nature and values of cultural resources and the need to preserve them.

Under *Alternative B*, five sites in the national monument would be allocated to public use within a High use SCRMA, and four sites would be allocated to public use within a Moderate use SCRMA. Levels of public use are described in the Cultural Resources section. Except for the Pueblo la Plata group of sites, which is accessible from Bloody Basin Roadon Perry Mesa, the four other sites in the High use area are in the Badger Springs and Black Mesa areas that are relatively accessible from Interstate 17.

There are inherent conflicts of the proposed public use of the Badger Springs and Richinbar pueblos on Black Mesa, the Rollie site, and to a lesser extent, the Badger Springs petroglyph site. Although their accessibility would enhance their value as interpretive sites, there is now no access to the mesa top sites from the Interstate 17. A locked gate restricts access to the few jeep trails on the mesa, and it is dangerous to exit and enter the busy highway from that point.

With the largest number of sites allocated to High public use, *Alternative B* entails the greatest potential for damage to cultural resources from interpretive development and public visitation. Conversely, opportunities for public education and enjoyment of cultural sites would also be more numerous under *Alternative B*.

In the Bradshaw-Harquahala Planning Area, sites could be selected for public use in all eight of the Special Cultural Resource Management Areas (Appendix F). As in the monument, *Alternative B* entails the greatest potential for damage to sites from public use, as well as the greatest potential benefit of public education and the recreational opportunities and economic returns of cultural heritage tourism.

Alternative C

In Agua Fria National Monument, only the Pueblo la Plata group of sites would be allocated to a High public use SCRMA and eight sites would be allocated to a Moderate public use SCRMA. *Alternative C* would switch four sites from High use prescriptions to less-intensive management actions. Although they would be developed at a less-intensive level, there are inherent conflicts in the proposed public use of the Badger Springs and Richinbar pueblos on Black Mesa, the Rollie site, and to a lesser extent, the Badger Springs petroglyph site as stated in *Alternative B*.

With fewer sites allocated to High public use, *Alternative C* entails less potential for damage to cultural resources from interpretive development and public visitation. Conversely, opportunities for public education and enjoyment of cultural sites would be more restricted due to more primitive facilities and fewer tours under this Alternative.

In the Bradshaw-Harquahala Planning Area, sites that are described for the plan, as well as sites that meet the guidelines for public use allocations, could be selected for public use in four of the Special Cultural Resource Management Areas (Appendix F) (Black Canyon corridor, Lake Pleasant/Agua Fria, Wickenburg/Vulture, and Harquahala

Mountains). The other four Special Cultural Resource Management Areas would be excluded from public use allocations. *Alternative C* entails a moderate potential for damage to sites from public use, as well as a moderate potential benefit in public education and the recreational opportunities and economic returns of cultural heritage tourism.

Alternative D

Alternative D would allocate no sites in Agua Fria National Monument to High public use and only the Pueblo la Plata site group to Moderate public use and associated management actions. All areas outside the Pueblo la Plata group of sites would be characterized by Low public use, with no interpretive development or commercial tours.

With only one site area allocated to public use, *Alternative D* entails the least potential for damage to cultural resources from interpretive development and public visitation. Conversely, opportunities for public education and enjoyment of cultural sites would be the most limited.

In the Bradshaw-Harquahala area, sites described for the plan and sites that meet the guidelines for public use allocations would be identified for public use in two of the Special Cultural Resource Management Areas (Black Canyon corridor and Harquahala Mountains). The other six Special Cultural Resource Management Areas would be excluded from public use allocations. *Alternative D* entails the least potential for damage to sites from public use, as well as the least potential benefit for public education and the recreational opportunities and economic returns of cultural heritage tourism.

***Alternative E* (Preferred Alternative)**

In the Agua Fria National Monument three accessible sites would be allocated to a High public use SCRMA under High use prescriptions:

- the Pueblo la Plata group on Perry Mesa,
- the Rollie site on Black Mesa, and
- the Teskey homestead site near Cordes Lakes.

All sites are within the Front Country RMZ. The Rollie site is easily accessible from the Sunset Point exit of Interstate 17. The other two sites are also accessible from well-established roads. Five sites would be allocated to a Moderate public use SCRMA under management actions defined for this level of use. The Badger Springs and Richinbar pueblos would be excluded from public use with no interpretive development. A site at the southern end of Black Mesa, accessible by hiking trails, would be added to those allocated to Moderate public use.

At least 60,570 acres (85 percent of Agua Fria National Monument) would be excluded from public use allocations. In these remote areas, visitors could encounter and observe archaeological sites under conditions of solitude in pristine settings. In the public use SCRMA's, interpretive uses would be site-specific and confined to the eight site areas and their Passage RMZs.

Alternative E balances the potential for damage and the availability of opportunities for public education and enjoyment of cultural sites. Interpretive plans with monitoring and protection measures would be implemented to mitigate adverse impacts from visitation. This Alternative satisfies the public's desire to visit Agua Fria National Monument's archaeological sites, by including sites allocated to High and Moderate public use levels on both Perry Mesa and Black Mesa. Opportunities would be open to those who wish to take advantage of tours of more developed facilities at accessible sites, as well as those who would like to hike to less accessible sites that have fewer visitors but offer interesting interpretive information.

In the Bradshaw-Harquahala Planning Area, sites that are described for the plan and those that meet the guidelines for public use

allocations would be selected for public use in six of the eight Special Cultural Resource Management Areas. The Black Mesa/Bumble Bee and Harcuvar Mountains Special Cultural Resource Management Areas would be excluded from public use allocations to protect fragile and significant sites from damage. In the other six Special Cultural Resource Management Areas, selected prehistoric and historic sites would be managed for interpretive development, educational uses, and public visitation. *Alternative E* entails a moderate potential for damage to sites from public use, as well as a relatively high potential benefit for public education and the recreational opportunities and economic returns of cultural heritage tourism.

4.12.6 From Paleontological Resource Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

There are no impacts expected.

4.12.7 From Recreation Management

***Alternative A* (No Action)**

Limiting the use of motorized vehicles to designated routes would help protect cultural resources, while continued use of roads leading to large archaeological sites might increase the potential for vandalism and damage.

Continued protection and interpretation of the historic Harquahala Peak Observatory would enhance opportunities for public education and cultural heritage tourism.

No limits would be established for the number of permitted commercial guided tours and special events; however, SRPs would include stipulations designed to protect cultural resources and archaeological sites allowed for such use. However, the potential for damage to cultural resources could continue as public awareness and subsequent casual use of these areas is increased.

Alternative B

Prohibiting the placing of geocaches on archaeological sites would help protect sites in Agua Fria National Monument and in the Bradshaw-Harquahala Planning Area.

Restricting campfires and camping near archaeological sites would reduce damage from the following:

- disturbing the ground's surface,
- collecting wood components from prehistoric or historic structures,
- dismantling features to create fire rings, and
- contaminating archaeological deposits.

Where camping is not confined to previously disturbed areas, such activities could disturb subtle features that are near sites or places not easily recognized as archaeological sites.

SRPs would include stipulations developed to monitor and protect archaeological sites that have been allocated to public use. In addition to an overall limit of 25 people per tour group visiting a site at any one time, these provisions would help protect cultural resources from the disturbance of increased visitation.

Public outreach and environmental education programs would help protect cultural resources by making the public more aware of their values, fragile nature, and need for protection. Conversely, the message of responsible recreation and resource stewardship would benefit cultural resources by discouraging activities that damage both cultural and natural resources.

BLM would consider converting some reclaimed routes to hiking trails. Limiting vehicle traffic to and on fragile sites would help protect the surface of these sites and could deter illegal pothunting by increasing the difficulty of

hauling equipment and illegally-collected items to and from sites.

Alternative B would allocate a relatively large area of Agua Fria National Monument (57,900 acres) to the Front Country RMZ. Among the Alternatives, it would allow for the most extensive network of travel routes and a higher number of special recreation permits. Additionally, it would allow for potentially higher numbers of visitors with a larger number of trails and other recreational facilities. Relatively high levels of visitor traffic could increase the potential for cultural resources damage. Impacts to archaeological sites from recreation could include the following:

- surface disturbance,
- artifact theft and breakage,
- artifact piling,
- wall destabilization,
- rock art graffiti, and
- casual digging.

Conversely, the relatively large Front Country RMZ would also allow for more interpretation, which could enhance the public's understanding and stewardship of cultural resources. Limiting access and recreational facilities in the Back Country RMZ would result in fewer visitors with a lower level of impacts on cultural resources.

Impacts in the Bradshaw-Harquahala Planning Area would be the same as those described for the monument.

Casual, unmonitored activities would likely be the greatest threat, as visitors travel further into remote areas that have previously received few visitors. BLM would be better able to manage the impacts of special events because these events would not be placed in zones of high cultural resource density. Locations for proposed courses and staging areas would be evaluated through cultural resource inventories, and, if approved, courses would be designed to avoid or mitigate damage to archaeological sites. Ultimately, special events could contribute to an increase in public awareness and casual use of these areas.

Alternative B would provide the most extensive opportunities for cooperative efforts in site interpretation and cultural heritage tourism projects. Potential partners could include many agencies, parks, and communities in the Phoenix, Black Canyon City, Prescott, Dewey, Yarnell, Wickenburg, and Lake Pleasant areas. Such partnerships could promote the following:

- expanded recreational opportunities,
- enhanced public education and understanding of cultural resources, and
- increased revenues from cultural heritage tourism.

Alternative C

Alternative C would allocate a smaller proportion of Agua Fria National Monument (42,410 acres) to the Front Country RMZ with an expected reduction in levels of recreational facilities and visitation. Impacts to archaeological sites from visitor use are expected to be less extensive in the areas allocated to the Back Country RMZ than in the areas allocated to the Front Country RMZ. Site visitation and educational opportunities from the interpretive development of archaeological sites would also decline.

In the Bradshaw-Harquahala Planning Area reductions in travel routes are expected to contribute to lower levels of unintentional and intentional damage to cultural resources. Opportunities for cultural heritage tourism partnerships would slightly decrease. However, communities and agencies in the Phoenix, Lake Pleasant, Black Canyon City, and Wickenburg areas could still take advantage of interpretive opportunities, particularly those developed in conjunction with parks and recreational trails.

Alternative D

Alternative D would allocate a small area of Agua Fria National Monument (1,530 acres) to the Front Country RMZ and result in a decline in

levels of visitation to interpreted sites and recreational facilities, which would be limited to the Pueblo la Plata area and zones near major roads. *Alternative D* would also close the largest number of routes and would allow only limited motorized use in the extensive Back Country RMZ.

Emphasizing primitive recreation would reduce the levels of damage to archaeological sites from interpretive development, vehicle use, and public visitation. Conversely, this would limit the regular monitoring of archaeological sites in remote areas, which could leave some sites more vulnerable to vandalism. *Alternative D* would also restrict campground development and target shooting, which would help protect sites. There would be fewer opportunities for public education through site interpretation. Restrictions on access for permitted scientific studies would limit the scientific use of sites and the gathering of information useful for research and site management.

Alternative D would place more emphasis on non-motorized recreation in the Bradshaw-Harquahala Planning Area. Additional travel routes would be closed further reducing potential damage to cultural resources. As in Agua Fria National Monument, an emphasis on primitive recreation would reduce the levels of damage to archaeological sites. Site visitation, educational opportunities, and community partnerships for cultural heritage tourism would decline. Cooperative efforts between the cultural heritage and recreation programs would focus on the existing interpretive facilities on Harquahala Peak and the Black Canyon recreational trail.

***Alternative E* (Preferred Alternative)**

Alternative E would allocate 12,440 acres of Agua Fria National Monument to the Front Country RMZ. Developed interpretive and recreational facilities would focus on a small number of areas, such as Badger Springs and Pueblo la Plata. The relatively large area allocated to the Back Country RMZ, along with a number of route closures, would contribute to protecting cultural resources, while still allowing for unobtrusive interpretive uses and access for scientific research and monitoring. Restrictions on camping and target shooting would also help protect cultural resources.

In the Bradshaw-Harquahala Planning Area *Alternative E* would involve an intermediate level of recreational facilities, and route closures. Impacts to cultural resources would be similar to those described for *Alternative C*. Recreational activities would continue to threaten damage to cultural resources, particularly in areas most accessible from urban zones and major roads. *Alternative E* emphasizes developing community partnerships to enhance interpretive opportunities, environmental education, and the promotion of responsible stewardship. Such activities would enhance the long-term effectiveness of public education, stewardship, and cultural resource protection by enlisting citizens as partners in these efforts.

4.12.8 From Visual Resource Management

***Alternative A* (No Action)**

No VRM classes have been established under this Alternative, which could result in the steady degradation of visual landscapes that contribute to both prehistoric and historic cultural sites.

***Alternatives B, C, D,* and *E* (Preferred Alternative)**

VRM classes and actions could affect qualities that contribute to the eligibility of cultural resource sites for nomination to the National Register of Historic Places. These qualities include integrity of setting (which refers to an undisturbed physical environment surrounding a site), and integrity of feeling (which refers to a site's expression of the aesthetic or historic sense of a particular period of time). For example, integrity of setting and feeling are important aspects of archaeological sites in Agua Fria National Monument. As a result, a

large portion of the area can be regarded as a cultural landscape preserved through time.

4.12.9 From Rangeland Management

***Alternative A* (No Action)**

Grazing impacts in Agua Fria National Monument can be considered from a historical perspective. The greatest livestock damage to archaeological sites most likely occurred before the implementing of the Taylor Grazing Act (TGA) in the 1930s. From about 1915 to 1926, the Coburn Brothers Cattle Company operated the Horseshoe Ranch and ran at least 12,000 head of cattle on Perry Mesa and in Tonto National Forest (Cordes 2002:22). The Horseshoe Ranch today maintains fewer than 400 cattle, which are dispersed over the mesas during much of the year.

Continued livestock grazing could affect cultural resources in both planning areas. Cattle trampling can crush, break, and relocate surface artifacts. Standing walls can collapse or become destabilized as a result of cattle rubbing up against them and cattle trails can accelerate site erosion. The continued presence of cattle in Agua Fria National Monument might also detract from the primitive experience for visitors.

Soil erosion caused by the loss of stabilizing vegetation or the trampling of streambanks in riparian areas could damage sites. Damage is expected to be greatest in sensitive sites where livestock tend to concentrate, such as at corrals, water sources, and the livestock trails that lead to them. Fewer impacts are expected from dispersed use.

In both planning areas, implementing the guidelines adopted in Arizona Standards for Rangeland Health and Guidelines for Grazing Administration (Land Health Standards) would maintain or improve ground cover and soil stability and reduce destructive impacts to cultural resources from soil erosion.

Installing and maintaining fences, cattle guards, cattle tanks, and other range management facilities might damage the physical or visual integrity of cultural resources. The proposed locations of new facilities would be surveyed in advance to determine archaeological site impacts and to avoid or mitigate them.

Alternative B

In Agua Fria National Monument impacts to cultural resources from rangeland and grazing management in upland areas would be similar to those described for *Alternative A*. Grazing in riparian areas would be limited to winter, which would reduce the incidence of impacts to archaeological sites in those areas.

Continued grazing in the Front Country RMZ would likely increase the potential for conflict between public use of the monument and grazing use, especially near archaeological sites (e.g. Pueblo la Plata) that are slated to be developed for public interpretation. To mitigate such conflicts, cattle could be excluded from areas on and near interpretive sites.

In the Bradshaw-Harquahala Planning Area impacts would also be similar to those described for *Alternative A*. Seasonal use of riparian areas would be limited to the winter, where practical. This could reduce impacts to cultural resources from soil erosion resulting from grazing.

Grazing could be limited if needed to protect natural or cultural resources. Such limits could include seasonal restrictions or excluding grazing in affected areas. Allotment boundaries could be adjusted to preclude grazing on lands devoted to a public purpose, such as an interpretive site. This provision would reduce conflicts between visitor use and the presence of cattle. BLM could also exclude livestock through fencing or other measures from sites that are suffering a loss of physical integrity from grazing and that need to be protected from further impacts. Installing and maintaining fences, cattle guards, cattle tanks, and other range management facilities would have the same impacts as those described for *Alternative*

A, as would implementing the guidelines adopted in *Arizona Standards for Rangeland Health and Guidelines for Grazing Administration* (Land Health Standards).

Alternative C

In both planning areas reductions in upland grazing and the removal of livestock from riparian habitats would reduce damage to cultural resources in nearby areas. Other impacts are expected to be similar to those discussed for *Alternative B*.

Alternative D

Eliminating grazing on public lands in Agua Fria National Monument and in the Bradshaw-Harquahala Planning Area would eliminate grazing-related damage to cultural resources. In Agua Fria National Monument this action would remove the potential for conflict between the interpretive use of Pueblo la Plata and ranching, as well as enhance the overall primitive experience for visitors.

***Alternative E* (Preferred Alternative)**

In both planning areas, grazing impacts would be similar to those described for *Alternative B*.

4.12.10 From Minerals Management

***Alternative A* (No Action)**

Any surface disturbance resulting from minerals actions could degrade cultural resources. All authorized mineral-related activities beyond casual use require a survey to determine if cultural resources are present. Hence, in all cases impacts are mitigated. During the surveys some cultural resources might be overlooked because they are buried and not visible on the surface. Therefore, in these cases mineral development might expose them and cause inadvertent damage.

The monument's proclamation (Appendix A) prohibits new mining claims, mineral material sales, and leasing of mineral or geothermal resources, as well as protects cultural resources from any mining disturbances. Two active mining claims, held by prospecting clubs for casual mining use, existed before the national monument designation. Because only casual use is allowed without a formal determination of valid existing rights, should the claimant decide to develop these claims beyond such use, a mining plan of operation would be required for BLM's review. This process involves lengthy and complicated validity studies to determine if a mineral discovery warrants development. Should the claim be found valid, the claimant is still required to comply with laws regulating mining and not create any undue and unnecessary degradation of the environment.

In the Bradshaw-Harquahala Planning Area developing leasable, saleable, and locatable minerals can damage cultural resources through surface and subsurface disturbance or removal of archaeological deposits. Furthermore, there is the potential for the removal, whether intentional or not, of boulders containing petroglyphs or other rock art. The visual impacts of mining can degrade the visual setting and related aspects of integrity of archaeological sites.

Archaeological surveys are completed to find and evaluate cultural resources that could be affected by proposed mining. BLM has the discretion to deny approval of proposed mineral material sales that would damage cultural resources. Approved mining plans contain provisions to avoid or mitigate damage to cultural resources, if such resources would be affected. Since it is often difficult to implement avoidance, scientific data recovery is typically implemented as a mitigation measure. However, casual mining in areas smaller than 5 acres typically does not require mining plans. As such, it is difficult to monitor and mitigate the effects of casual mining on cultural resources or the effects of related activities such as camping.

Alternative B

Minerals management would not affect cultural resources under any Alternatives in Agua Fria National Monument because of prohibitions against mining.

In the Bradshaw-Harquahala Planning Area cultural resources would be protected by closing areas to mineral leasing, mineral material sales, and mineral entry. Where cultural resources are present, such closures would reduce damage to their physical and visual integrity. ACECs, lands allocated to maintain or enhance wilderness characteristics, and lands that are reconveyed to the Federal Government could be closed.

Alternative B would close the fewest number of areas to mining-related activities. The potential impacts of mineral development on cultural resources would be greatest under this Alternative.

Alternative C

Impacts would be less than *Alternative B*, because *Alternative C* includes a number of ACECs and lands allocated to maintain or enhance wilderness characteristics that have provisions for restricting mining.

Alternative D

Impacts would be similar to *Alternative C*, except *Alternative D* also restricts activities on lands that are reconveyed to the Federal Government. Therefore, the potential impacts of mineral development on cultural resources would be the least under *Alternative D*.

Alternative E (*Preferred Alternative*)

In the Bradshaw-Harquahala Planning Area the impacts of minerals management on cultural resources would be similar to those described for *Alternative B*.

Tule Creek ACEC would be withdrawn from mineral entry, closed to leasing and mineral material disposals. In the Black Canyon MU, riparian areas on reconveyed lands would be closed to mineral material sales, which could include sand and gravel mining. These restrictions would help protect cultural resources in Tule Creek ACEC and in riparian zones of the Black Canyon area.

4.12.11 From Fire Management

***Alternative A* (No Action)**

Wildfires and prescribed burns can affect cultural resources through direct exposure to fire and disturbances from the methods used to suppress and manage fires, as well as natural fuels. Flammable structures and features, such as wooden buildings and mining headframes, are particularly vulnerable to damage and destruction by fire. Damage to historical structures is a particular management concern for sites in the Bradshaw and Weaver Mountains.

The prehistoric residents of Agua Fria National Monument were likely to be well acquainted with fire as a natural process in this fire-adapted grassland ecosystem. The remains of their villages have likely been burned many times over the past centuries. Evidence reveals that the relatively low intensity of the grassland fires has spared major damage to archaeological sites. The Baby Canyon Ruin in Agua Fria National Monument and the Squaw Creek Ruin in the Tonto National Forest have been burned over in the past decade. Neither site has suffered damage to walls, artifacts, or rock art. The loss of vegetation from fire could increase the potential for soil erosion in susceptible areas, although this problem has not been observed at these two sites.

Prescribed burns would temporarily affect the visual setting of cultural resources for visitors to Agua Fria National Monument. In some cases, prescribed burns have benefited scientific studies by exposing previously obscure archaeological features in the national

monument, such as agricultural terraces (North 2002).

Fire suppression and fuels management techniques could cause surface disturbance to cultural resources. Surface disturbance could result from staging activities, vehicle tracks, the use of earth-moving equipment, or applying mechanical treatments to manage vegetation. The use of heavy equipment and mechanical thinning of trees also could temporarily disturb soils and increase the potential for erosion.

***Alternatives B, C, D,* and *E* (Preferred Alternative)**

Archaeological surveys in both planning areas, including inventories of 10 percent of areas above 3,500 feet in elevation in the Bradshaw-Harquahala Planning Area would help to find sensitive cultural resources that need to be avoided by fire and fuels management, or that require special attention during wildfire suppression.

BLM would implement measures to protect cultural resources, such as the use of minimum impact suppression tactics to reduce damage to archaeological sites as well as to natural resources. Other protection measures could include the following:

- using foam or retardant to protect historic structures;
- removing fuels around vulnerable sites;
- creating fire breaks that would protect sites while avoiding damage to them; and
- covering rock art in fire retardant fabric.

The impacts of fire management under these Alternatives would be similar to those discussed for *Alternative A*.

4.12.12 From Wild Horse and Burro Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

There are no impacts to cultural resources expected.

4.12.13 From Management of Transportation and Public Access

***Alternative A* (No Action)**

Continued restrictions that limit the use of motorized vehicles to designated routes in Agua Fria National Monument would help protect cultural resources.

Continued use of existing roads leading to large archaeological sites in Agua Fria National Monument might increase the potential for vandalism and damage to these sites as more people visit the monument.

Alternative B

All Alternatives include closures of selected routes that lead directly to archaeological sites that have been damaged or are threatened by vandalism. In many cases, there is no other obvious purpose for these routes. Where such routes are being reclaimed by natural processes, as at Pueblo Pato in Agua Fria National Monument, or where they exist at other sites that have been allocated to public use, BLM would consider converting them to hiking trails. Limiting vehicle traffic to and on fragile sites would help protect the surface of the sites and could deter illegal digging and collecting activities by complicating the task of hauling equipment and collected items to and from sites.

Alternative B would allow for a more extensive network of transportation routes, which could increase the potential for cultural resources damage. Direct impacts could include disturbance to surface features such as walls, soils, and artifacts from vehicle traffic resulting in damage, breakage, or displacement. A more extensive road network would facilitate public access to a larger number of archaeological sites,

increasing their vulnerability to vandalism and artifact theft.

Conversely, increased access would also allow for more interpretation, which could enhance the public's understanding and stewardship of cultural resources. Limiting access in the Back Country RMZ would result in fewer visitors with a lower level of impacts on cultural resources.

A more extensive network of transportation routes would also be supported in the Bradshaw-Harquahala Planning Area. In general, relatively higher levels of public access would pose greater threats to the integrity of cultural resources, as described above for Agua Fria National Monument.

Alternative C

Impacts would be similar to *Alternative B*, except *Alternative C* would allocate fewer transportation routes. More limited public access would be expected to reduce the impacts to archaeological sites from vehicle and visitor traffic in both planning areas.

Alternative D

Alternative D would close the largest number of transportation routes in both planning areas. In the monument, only limited motorized use would be allowed in the extensive Back Country zone. While this would reduce the levels of damage to archaeological sites from interpretive development, vehicle use, and public visitation, fewer areas would be available for site visitation and cultural heritage tourism projects.

Restricted access would also limit the regular monitoring of archaeological sites in remote areas, which could make some sites more vulnerable to vandalism. Restrictions on access for permitted scientific studies would limit the scientific use of sites and the gathering of information useful for research and resource management.

Alternative E (*Preferred Alternative*)

Impacts from transportation and public access would be similar to those described under *Alternative C* for Agua Fria National Monument. The number of route closures under this Alternative would contribute to protecting cultural resources, while still allowing for unobtrusive interpretive uses and access for scientific research and monitoring.

In the Bradshaw-Harquahala Planning Area *Alternative E* would involve an intermediate level of route closures. Impacts to cultural resources would likely be similar to those described for *Alternative C*.

4.12.14 From Management of Wilderness Characteristics

***Alternative A* (No Action)**

Under current resource management plans, no areas have been specifically identified for management of wilderness characteristics. Therefore, there are no associated impacts on cultural resources.

***Alternatives B, C, D,* and *E* (Preferred Alternative)**

Management of wilderness characteristics would maintain natural landscapes and remoteness, with an emphasis on primitive and non-motorized recreation. Limits on public access and motorized travel would reduce damage to remote archaeological sites from vehicle traffic and visitor use. Maintenance of wilderness characteristics would also help to preserve the visual integrity and natural settings of archaeological sites and cultural landscapes.

4.13 Impacts on Paleontological Resources

Impacts to paleontological resources include effects on resources such as petrified wood and other fossils. Paleontological resources are a nonrenewable resource that provides scientific value and clues to geologic history. Although only a minimal amount of paleontological research has been conducted in the region, 11 paleontological sites are known to occur in or close to the planning areas. None of the known paleontological sites are on BLM-managed land in either of the planning areas.

No known paleontological resources have been documented in either planning area. The geology of the planning areas is not conducive to paleontological resources. The potential for paleontological resources does; however, exist, and could be affected by surface disturbance. However, the potential for such impacts is very low.

4.13.1 From Special Area Designations

***Alternative A* (No Action)**

In Agua Fria National Monument, no significant paleontological resources are known to exist. As such, impacts to paleontological resources from special area designations are expected to be minimal. In areas of the monument where paleontological resources may be discovered, management for reduced public use would diminish potential impacts to these resources.

Paleontological resources in existing wilderness areas in the Bradshaw-Harquahala Planning Area would continue to be at low risk of inadvertent damage. Since these areas are closed to roads and are rarely visited, the impacts to paleontological resources are expected to be minimal.

***Alternatives B, C, D,* and *E* (Preferred Alternative)**

Impacts to paleontological resources in Agua Fria National Monument are expected to be the same as described for *Alternative A*.

In the Bradshaw-Harquahala Planning Area, fencing Tule Creek ACEC would prevent damage to paleontological resources caused by OHV traffic and livestock. Paleontological resources in other special area designations would be protected more than under *Alternative A* as restrictions to surface-disturbing activities are implemented.

4.13.2 From Lands and Realty Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

Activities allowed under valid existing rights in Agua Fria National Monument could affect paleontological resources if resources are discovered near land clearing and construction.

Under the current management of the Bradshaw-Harquahala Planning Area paleontological resources could be affected if land clearing and construction disturb the soil near paleontological sites. Additionally, construction in existing corridors and at telecommunication sites could inadvertently damage paleontological sites. Building of new utility lines could disturb paleontological resources by developing service roads and by other digging.

Building or maintaining utility and transportation corridors and telecommunication sites in Agua Fria National Monument is not expected to affect paleontological resources.

4.13.3 From Management of Soil, Air, and Water Resources

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

In Agua Fria National Monument, current management prescriptions to improve soil stability, increase vegetation cover, and reduce erosion might help preserve potential paleontological sites.

Under the current management of the Bradshaw-Harquahala Planning Area no impacts to paleontological resources are expected from management of soil, water, and air resources.

4.13.4 From Biological Resource Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

Throughout the planning area, no impacts to paleontological resources are expected from biological resource management.

4.13.5 From Cultural Resource Management

***Alternatives A (*No Action*), B, C, D,* and *E* (Preferred Alternative)**

Actions taken to protect cultural resources in Agua Fria National Monument would likely help preserve paleontological sites as well. Unknown paleontological resources could be unearthed or otherwise disturbed by ground disturbance in developing public access to cultural sites.

In the Bradshaw-Harquahala Planning Area no impacts are expected to paleontological resources from CRM.

4.13.6 From Paleontological Resource Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

There are no impacts expected.

BLM's PFO would classify areas because of their potential to contain vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils. The classification process would result in a sensitivity map that would enable BLM to direct protection measures or research projects toward the most significant or threatened areas. The sensitivity map would also help BLM screen proposed actions to determine effects on paleontological resources.

4.13.7 From Recreation Management

***Alternative A* (No Action)**

Under the current management of Agua Fria National Monument concentrated recreation in certain areas could inadvertently damage potential paleontological resources.

In the Bradshaw-Harquahala Planning Area illegal OHV use of four-wheel-drive vehicles, all-terrain vehicles, and motorcycles might damage paleontological resources on or near the surface. Paleontological resources might be destroyed as vehicles drive over them. Some people might also use these types of vehicles to drive to remote areas, where they could illegally collect paleontological resources. Under the current management of the Bradshaw-Harquahala Planning Area, limiting OHV travel and posting directional signing reduces the likelihood of inadvertent damage to paleontological resources. Yet the presence of roads open to the public can inadvertently encourage travel to remote areas.

Alternative B

In the Front Country and Passage RMZs in Agua Fria National Monument certain areas open to OHV use could continue to cause inadvertent damage to paleontological resources on 58,200 acres.

In the Bradshaw-Harquahala Planning Area recreation management common to all Alternatives could damage paleontological resources through ground disturbance resulting from developing recreational facilities.

169 miles of routes would be closed in the Bradshaw-Harquahala Planning Area. Reduction in miles of routes could reduce the potential impacts of motorized recreation to paleo resources.

Alternative C

Impacts to Agua Fria National Monument would be the same as described in *Alternative B,* except to a lesser degree due to the reduced amount of Front Country and Passage RMZs (42,480 acres).

In the Bradshaw-Harquahala Planning Area impacts would be similar to *Alternative B*, except the closure of more routes (382 miles would provide increased protection to paleontological over the previous alternative.

Alternative D

Impacts to Agua Fria National Monument would be the same as described in *Alternative C*, except to a lesser degree due to the smallest amount of Front Country and Passage RMZs (2,520 acres).

In the Bradshaw-Harquahala Planning Area impacts would be the least under this Alternative due to the largest amount of routes being closed (723 miles)

Alternative E (*Preferred Alternative*)

Impacts to Agua Fria National Monument would be the similar to previous Alternatives, except that more area would allocated to Front Country and Passage RMZs (13,740) than *Alternative D*, and less area than *Alternatives B and C.*

In the Bradshaw-Harquahala Planning Area impacts would be less than *Alternative B,* but more than *Alternatives C and D.*

4.13.8 From Visual Resource Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

There are no impacts expected.

4.13.9 From Rangeland Management

***Alternative A* (No Action)**

Under the current management of Agua Fria National Monument, grazing might affect paleontological resources by reducing vegetation and increasing erosion, leading to potential exposure and degradation of fossils.

Under the current management of the Bradshaw-Harquahala Planning Area, despite improved rangeland management practices from implementing the Arizona Standards for Rangeland Health and Guidelines for Grazing Administration (Land Health Standards), continued grazing might decrease vegetation growth, increase soil erosion rates, and disturb paleontological sites.

The Land Health Standards seek to maintain or promote ground cover that would provide for infiltration, permeability, soil moisture storage, and soil stability, thereby reducing the following:

- erosion rates,
- potential for exposure, and
- the degradation of paleontological sites.

Alternatives B* and *C

Impacts would be similar to those under *Alternative A.*

Alternative D

Elimination of grazing, as in *Alternative D*, could increase soil stabilization by increasing vegetation cover, reducing loss of paleontological resources to soil erosion.

***Alternative E* (Preferred Alternative)**

Impacts would be similar to those under *Alternative A.*

4.13.10 From Minerals Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

Under the current management of Agua Fria National Monument minerals management is not expected to affect paleontological resources. In the Bradshaw-Harquahala, any mining might disturb such resources, but if fossils are found during mining, potential damage would be mitigated as suitable and practical.

4.13.11 From Fire Management

***Alternative A* (No Action)**

Where prescribed burning is conducted in Agua Fria National Monument, the use of heavy equipment and mechanical thinning of trees could temporarily promote an increase in soil disturbance and affect potential paleontological sites.

***Alternatives B, C, D,* and *E* (Preferred Alternative)**

In both planning areas, fire-related activities that disturb the surface, such as the use of heavy equipment to build fuel breaks, could inadvertently affect paleontological resources.

4.13.12 From Wild Horse and Burro Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

There are no impacts expected under any Alternative.

4.13.13 From Management of Transportation and Public Access

***Alternative A* (No Action)**

In the Agua Fria National Monument, areas open to vehicular access could continue to cause inadvertent damage to paleontological resources.

In the Bradshaw-Harquahala Planning Area unmanaged or illegal vehicle use could destroy or degrade potential paleontological resources. Under the current management of the Bradshaw-Harquahala Planning Area, limiting OHV travel and posting directional signing reduces the likelihood of inadvertent damage to paleontological resources.

***Alternatives B, C, D* and *E* (Preferred Alternative)**

Impacts in the monument would be similar to *Alternative A*, except more restrictions on routes may help preserve potential sites.

In the Bradshaw-Harquahala Planning Area limiting vehicular travel to existing routes could help preserve paleontological resources by reducing the opportunity for inadvertent disturbance through OHV travel. Further restrictions on routes as dictated by each

alternative could further reduce potential damage.

4.13.14 From Management of Wilderness Characteristics

***Alternative A* (No Action)**

Currently no areas are allocated for the management of wilderness characteristics. As a result, no impacts are expected.

***Alternatives B, C, D* and *E* (Preferred Alternative)**

In areas allocated to maintain or enhance wilderness characteristics, impacts to potential paleontological resources would be reduced due to restrictions on vehicular access and the desire to retain primitive and natural characteristics.

4.14 Impacts on Recreation

This section compares the impacts of the Alternatives on outdoor recreation through changes in the recreation opportunities, settings, and access. Changes in the settings would result in a corresponding change in the opportunity to achieve a desired recreation experience in the preferred setting.

The escalating population of the Phoenix metropolitan area, coupled with the growth of other communities in the region will continue to increase recreation use of public lands. Visits to public lands are expected to grow at an annual percentage at least equal to the population growth of the region whether or not BLM provides more opportunities, facilities, or management presence.

One of the key issues affecting recreation activities is the fast growth of recreational OHV use area. The projected increase of more than two million people in Maricopa and Yavapai Counties is expected to substantially increase recreation use, especially OHV use, in the planning areas.

Agua Fria National Monument was not created for purposes of recreation, and recreation should be considered a secondary use that is permitted as long as the monument Purpose and Significance are protected.

Cultural resources in the monument would be managed according to three levels of public use for different recreation experiences (different levels described in detail in the Cultural Resources section).

Specific areas and sites for each level are described for the Alternatives.

4.14.1 From Special Area Designations

***Alternative A* (No Action)**

Existing recreation opportunities and experiences in the eligible WSR corridors and wilderness areas would be retained. Increasing motorized and non-motorized recreation on public lands surrounding existing wilderness could contribute to increased wilderness visitation. Potentially growing numbers of non-motorized users could impair solitude opportunities and contribute to trailing and campsite use impacts along the edge and in the interior of the wilderness areas.

Alternative B

Designating Bloody Basin Road as a back country byway could affect the recreation setting along the byway by increasing traffic and interaction among visitors. Opportunities for more primitive recreational experiences in the eligible WSR corridor near the river crossing could be diminished. The interpretive elements of the byway would increase visitor awareness, appreciation, and enjoyment of the national monument's natural and cultural resources.

Designating a back country byway along Constellation Mine Road would have impacts similar to the same designation on Bloody Basin Road, although the Constellation Mine Road does not cross an eligible wild and scenic river. The Constellation Mine Back Country Byway crosses an area of high OHV use with many miles of trails. Conflicts with OHV users could increase because of the increased traffic on the byway. Conflicts between byway users and large OHV groups could diminish the scenic drive experience. Moreover, there could be an increased potential for accidents at OHV trails and byway intersections because drivers might not expect multiple trail crossings in the area. The interpretive components would increase visitor awareness, appreciation, and enjoyment of the mining history of the Wickenburg area.

Designating Tule Creek ACEC would reduce opportunities for vehicular recreation by closing the fenced area to motor vehicles. The total route closure would amount to 1.1 miles. The route closure would reduce conflicts among user types and enhance the opportunity for non-motorized activities in a more natural setting. Eliminating grazing would also help retain a more natural setting for recreation and reduce conflicts with livestock. Interpretive elements would increase appreciation of the natural and cultural resources under protection in the ACEC.

In wilderness areas, establishing criteria to manage larger group activities will protect wilderness values, most notably enhancing opportunities for solitude sought by wilderness visitors. Future opportunities for commercial and vending operations in wilderness areas will be forgone as these permits will be prohibited.

Alternative C

Designating the back country byways would have impacts similar to those under *Alternative B.*

ACEC designation would have little to no impacts within Agua Fria National Monument due to the coverage of the national monument proclamation.

The effects from ACEC designations on recreation within Agua Fria National Monument are described in the national monument proclamation. Route closures could limit access for some visitors in the Silver Creek area and diminish vehicular recreation opportunities. To protect the resources in the Silver Creek area, routes can be closed without ACEC designation and these impacts could be realized anyway.

Designating Tule Creek ACEC would have impacts similar to those under *Alternative B*.

Designating ACECs in the Bradshaw-Harquahala Planning Area, comprising 87,310 acres, would improve opportunities for primitive recreation experiences like hiking, hunting, wildlife observation, camping, and sightseeing in natural settings. Non-motorized trail systems could be enhanced in some areas, and conflicts among different user types would be reduced. Selected motorized routes in the ACECs would be closed to protect resources. These closures would lessen opportunities for motorized activities. About 112 miles, or 90 percent, of the routes in ACECs would be closed; the selection of routes to remain open would be based on maintenance of connectivity of touring routes that do not affect the ACEC's resources.

Although the resources protected by ACECs are generally located in areas without many routes, connectivity in the immediate local route network could be reduced. In the Harquahala Mountains ONA the ACEC designation would prevent the future development of recreation sites and decrease opportunities to experience the area in a more developed setting. The lack of facilities for parking, staging, and interpretation would disperse motorized activities.

Impacts to wilderness areas due to group size and permit restrictions would be the same as in *Alternative B.*

Alternative D

Alternative D proposes no back country byways, and no impacts are expected.

Designating ACECs would have impacts similar to those described for *Alternative C*, except that the ACECs would encompass 354,690 acres and all 413 miles of routes in the proposed ACEC boundaries would be closed. The added management restrictions on motorized routes would increase limitations on certain recreation and would eliminate them in some areas. The route closures under *Alternative D* would reduce the connectivity of the route network more than they would under *Alternative C* and could disrupt cross-country touring routes. Motorized recreationists would be displaced and would potentially travel to nearby areas and routes with available motorized opportunities. Additional camping and off-road driving impacts would accrue along these periphery areas and routes, impacting vegetation and scenery. Increased crowding of routes would reduce the quality of dispersed recreational experiences for some users.

Impacts to wilderness areas due to group size and permit restrictions would be the same as in *Alternative B.*

***Alternative E* (Preferred Alternative)**

Designating Bloody Basin Road and the Constellation Mine Road/Buckhorn Road as back country byways would have the same impacts as described for *Alternative B*, except that Buckhorn Road would be included as part of the Constellation Mine Road Back Country Byway. This inclusion would enhance opportunities for loop trips and longer touring on these byways.

Designating Tule Creek ACEC would be the same as *Alternative B*.

Designating Black Butte and Harquahala Mountains ONAs, comprising 89,260 acres, would affect recreation by assuring opportunities for primitive recreation and solitude in natural and non-motorized settings. Non-motorized trail systems and opportunities would be enhanced, and conflicts among different user types would be reduced.

Impacts of closing selected routes in the ACECs (22.5 miles, or 14 percent) would be less than those described under *Alternatives C* and *D*, but more than *Alternative B.*

The route closures in ACECs would reduce the connectivity of the route network more than would *Alternative B* and *C*, and cross-country touring routes could be disrupted. Although the resources to be protected in ACECs are generally in areas without many routes, connectivity in the immediate local route network could be reduced.

ACEC designations would create the same impacts as in *Alternative C.*

Outstanding opportunities for backpacking, hiking, camping, hunting, and nature study would be maintained in the five designated wilderness areas.

Impacts to wilderness areas due to group size and permit restrictions would be the same as in *Alternative B*.

4.14.2 From Lands and Realty Management

***Alternative A* (No Action)**

In the Bradshaw Harquahala Planning Area, disposal of lands in the Upper Agua Fria River basin, the Table Mesa area, and Skull Valley north of Highway 89 would reduce or eliminate opportunities for recreation and could affect the Black Canyon Trail. The lands in the Table Mesa area and in Skull Valley generally experience moderate to high OHV use. Those uses could potentially relocate to other areas. The higher concentration of activities in those areas could diminish the recreation experience for some users because of the higher numbers of people encountered. The Upper Agua Fria River

basin lands support multiple recreation activities and provide some valuable linkages to Forest Service land to the east and west.

Utility and transportation corridors are not expected to impact recreation, unless potential projects are preformed. Environmental analysis of projects would determine possible impacts to opportunities for recreation, such as limits to route access and the creation of new routes for maintaining facilities.

Alternative B

Non-Federal lands in Agua Fria National Monument would be considered for acquisition if they become available from a willing seller. BLM would also consider acquiring adjacent non-Federal lands that enhance Agua Fria National Monument's values, if these lands become available from a willing seller. These two actions would affect recreation opportunities by improving access.

Impacts to the utility corridor in Agua Fria National Monument would be similar to *Alternative A,* except that the corridor would be narrowed.

Impacts in the Bradshaw-Harquahala Planning Area would be similar to those under *Alternative A,* except that lands in the Table Mesa area would be retained and recreation on those lands could continue. Acquiring lands that meet the criteria described for Chapter 2 could enhance opportunities for recreation by increasing connectivity and manageability of public lands. No impacts are expected until specific parcels are selected for acquisition.

Alternative C

Lands-related impacts to Agua Fria National Monument would be similar to those described for *Alternative B,* except that eliminating the utility corridor would remove any potential impacts from future utility proposals.

Due to the two methods that have been developed for determining which lands are potentially suitable for disposal through sale or exchange (2.4.2.1.1) differing impacts are expected under each.

No impacts are expected to result from disposing of lands selected under the first set of disposal criteria because parcels are small and generally in the Phoenix urban area. Because recreation on these parcels should be minimal, relocating the activities should not affect the relocation areas.

The 49,100 acres selected for disposal by the second set of criteria mainly consist of scattered lands disconnected from other BLM lands. Disposal of some parcels might disrupt the connectivity of the route network if the new owner closes routes across the property. Because the lands are isolated from other BLM lands, BLM could not develop new routes to mitigate the losses. Camping, target shooting, rock hounding, and other site-specific recreation could be affected for some users if such sites are on the disposed lands and are later closed. Loss of these lands would not appear to affect other recreation activities (e.g. wildlife viewing, most other motorized and non-motorized activities).

Impacts from utility and transportation corridors would be similar to those under *Alternative A.*

Alternative D

Lands-related impacts to Agua Fria National Monument would be similar to those described for *Alternative C*. Because no lands would be disposed in the Bradshaw-Harquahala Planning Area, no impacts are expected. Impacts from corridors would be similar to those under *Alternative A*.

***Alternative E* (Preferred Alternative)**

Lands-related impacts to Agua Fria National Monument would be similar to those described for *Alternative B.*

No impacts are expected to result from disposing of lands in the Bradshaw-Harquahala Planning Area because parcels are small, isolated, or

generally in the Phoenix urban area. Because recreation on these parcels is generally minimal, relocating the activities to other BLM lands is not expected to have noticeable impacts.

Impacts from other lands actions on recreation would be similar to those described for *Alternative B.*

4.14.3 From Management of Soil, Water, and Air Resources

***Alternatives A (*No Action*), B, C, D,* and *E* (Preferred Alternative)**

Maintaining or improving water quality and providing for surface and subsurface flows in Agua Fria National Monument would benefit recreation. Water is a magnet to wildlife and to recreation pursuits. Both wildlife viewing and water-related recreation, such as relaxing along a stream, provide for sustaining social, psychological, physical, and spiritual renewals.

Managing air quality could affect recreation through restrictions to protect Agua Fria National Monument's values. The potential for excessive dust might result in rescheduling or redirecting recreation events authorized through SRPs.

Managing air quality could affect certain recreational activities, such as large OHV events and motorized competitive races, by restricting or rescheduling events so that they comply with county air quality rules. Failure to meet fugitive dust and PM_{10} emission standards could cause public lands to be closed for OHV riding, permitted events, and staging for OHV and equestrian or organized group activities. Facilities and developments would have to be designed and installed with dust abatement features.

4.14.4 From Biological Resource Management

***Alternative A* (No Action)**

Modifying fencing to allow wildlife movement would improve wildlife viewing opportunities by enhancing the ability of wildlife to move throughout Agua Fria National Monument. Developing new water sources could also enhance viewing opportunities by strengthening wildlife populations and providing areas where wildlife would congregate.

Use of prescribed burns could temporarily impair recreational experiences by disturbing the visual setting and by closing burn areas to recreation. Habitat improvements could enhance wildlife populations and viewing opportunities.

Managing Arizona night lizard and Sonoran mountain king snake habitat by closing mining roads to recreational use could limit opportunities for recreation in habitat areas.

Developing wildlife waters and protecting big horn sheep habitat as described for the Lower Gila North MFP (BLM 1983) would continue to sustain wildlife populations for wildlife viewing and hunting.

The Lower Gila North MFP (BLM 1983) limits motorized vehicles in desert tortoise, Arizona night lizard, and Sonoran mountain king snake habitat to existing routes only. This management has not been implemented. The MFP planning area is considered open to cross-country travel, and current OHV recreation would continue to be allowed.

Alternative B

Impacts in the Agua Fria National Monument would be the same as *Alternative A.*

Managing desert tortoise habitat could reduce opportunities for motorized recreation by limiting the development of new routes. Limiting motorized special events to the period from October 15 to March 31 in Category I and II desert tortoise habitat would limit the potential number of events in some locations. Evaluating

permits for impacts on desert tortoise habitat (Map 2-58) could affect opportunities for events in otherwise desirable settings if impacts on desert tortoise occur in the proposed event location. Events might have to be postponed, cancelled, or relocated to a less desirable location.

Ensuring connectivity of habitat for wildlife could affect motorized recreation by closing routes that cross sensitive areas or movement corridors. Opportunities for wildlife viewing could be enhanced because wildlife would be able to move through their traditional corridors.

Designation of Harquahala Mountains Wildlife Habitat Area (WHA) would Protect sensitive wildlife habitat through route closures would diminish opportunities for motorized recreation. Enhancing wildlife habitat could affect opportunities for wildlife viewing by strengthening populations.

Ensuring connectivity of habitat for wildlife could affect motorized recreation by closing routes that cross sensitive areas or movement corridors. Opportunities for wildlife viewing could be enhanced because wildlife would be able to move through their traditional corridors.

Alternative C

Limiting routes in pronghorn corridors in Agua Fria National Monument could reduce the connectivity of the route network and diminish the motorized recreation experience of some users. Prohibiting the development of recreational sites in pronghorn corridors could affect recreation opportunities by eliminating the possibility of such facilities as restrooms, parking areas, or ramadas, which could enhance the recreation experience for some users.

Alternative C would, however, provide more areas for visitors to enjoy viewing wildlife and experiencing solitude. Wildlife corridor concerns were considered as part of the evaluation process for designating the route network for *Alternative C*.

Agua Fria National Monument has no developed recreational sites except for minimal improvements at Badger Springs and in the Cordes Lakes area. Prohibiting the development of recreational sites in pronghorn corridors would eliminate the possibility of such facilities as restrooms, parking areas, or ramadas, which could enhance the recreation experience of some users. Modifying fences to allow wildlife to move more freely could enhance wildlife viewing opportunities in the national monument.

Prohibiting new fences in the Belmont/Big Horn Mountains and Date Creek Mountains WHA areas, and the Upper Agua Fria River Wildlife Habitat Corridor would maintain the current connectivity of the route network.

In the Bradshaw-Harquahala Planning Area, closing or limiting vehicle routes in WHA areas to protect wildlife habitat would have the same impact on recreation as described in *Alternative B.* Prohibiting construction of new routes in the Date Creek Mountains WHA area and the Upper Agua Fria River Habitat Corridor could lessen motorized recreation opportunities by preventing maintenance of route connections when other routes are closed for resource protection. Fragmented route systems could diminish the recreational experience for some users and possibly lead to an increase in unauthorized cross-country travel to connect routes.

Impacts from desert tortoise restrictions would be the same as those identified in *Alternative B.*

Alternative D

Impacts from route limitations and development of sites for recreation in the pronghorn corridors in Agua Fria National Monument would be similar to those under *Alternative C.*

Removing all fences and prohibiting new ones in Agua Fria National Monument would maintain connectivity in the motorized route system developed for *Alternative D* and enhance the natural appearance of the landscape. Wildlife viewing could be enhanced because wildlife

could move throughout most of the national monument.

In the Bradshaw-Harquahala Planning Area most wildlife management would be accomplished through ACEC and WHA designation and management. Impacts would be the same as those discussed in *Alternative B* and in section 4.14.1.

Management restrictions for desert tortoises and in the Harquahala/Belmont/Big Horn Wildlife Corridor could limit recreation developments and restrict or preclude some recreation activities, diminishing the recreation experience of some users. Impacts from other desert tortoise restrictions would be the same as those identified in *Alternative B.*

***Alternative E* (Preferred Alternative)**

Designation of specified pronghorn corridors in the monument would have the same impacts as described under *Alternative C.*

Prohibiting the developing of recreational sites in pronghorn corridors could affect recreation opportunities by eliminating the possibility of such facilities as restrooms, parking areas, or ramadas, which could enhance the recreation experience for some users.

Prohibiting new fences in the Belmont/Big Horn Mountains WHA would help maintain the current connectivity of the route network.

Closing or limiting vehicle routes in the Belmont/Big Horn Mountains WHA area, the Harquahala/Belmont/Big Horn Wildlife Corridor, and the Harquahala Mountains and Black Butte ONAs would have the same impacts as *Alternative C*.

Prohibiting the building of new routes in WHA areas and ACECs would have the same impacts as described in *Alternative B.*

Impacts from desert tortoise restrictions would be the same as those identified in *Alternative B.*

4.14.5 From Cultural Resource Management

***Alternative A* (No Action)**

Current conditions would be maintained with no significant change in interpretive opportunities. Two permittees now offer cultural resource tours and activities in Agua Fria National Monument, but BLM has devised no management procedure for controlling the number of permits. More permits could lead to allocation and protection problems if larger numbers of tours and activities visit the same sites. Increased group use could also diminish the recreation experience of the general user.

The Lower Gila North MFP (BLM 1983) called for study plots and inventories to reduce land use impacts on cultural resources and to allocate sites for scientific use and preservation for future use. The study plots have not been established and should not restrict recreation at cultural sites. Allocation to scientific use or preservation would limit certain sites for commercial or general recreation use.

Alternative B

Potential closures of routes as protective measures for sites would affect certain recreational activities, especially where such activities are influenced by the interconnectedness of the route network. However, conflicts among user types could decline, and opportunities could increase for an enhanced sense of solitude and enjoyment of cultural resources in a natural setting.

Maintaining signs and developing interpretive programs would lead to a better understanding and appreciation of the sites selected to be open to the public. Increased visitation to sites resulting from promoting public access could affect the interpretive recreational experience by (1) increasing interaction with other visitors and (2) diminishing the sense of site discovery that visitors experience before sites are allocated for public access.

Also affecting opportunities for recreation would be stipulations on SRPs to limit damage such as artifact removal or displacement, and requirements for SRP holders to implement customer education programs. The recreational experience for visitors would be enhanced by learning the value of the cultural resources and the importance of retaining their integrity and of protecting sites for future recreational opportunities.

Limiting group visits to cultural sites to 25 persons at a time, could limit opportunities for some groups to experience the cultural resources at popular sites. Such limitation could maintain an enjoyable experience for the public by reducing possible overcrowding caused by large groups at sites and preserving a more natural experience.

Developing public use areas according to the various levels of development and use described in Cultural Resources in Chapter 2, would maintain opportunities for a variety of recreational experiences relating to the cultural resources in the national monument. Specifically, sites would have interpretive and educational components. Access for multiple users (including the disabled) would be improved, and sites would be stabilized and preserved for future recreational opportunities.

Improving routes and trails would open sites to a wider variety of users. Limiting motorized access to at least a quarter mile to a half mile from sites would limit the opportunities for recreation of some users but would also reduce conflicts among user types and maintain a non-motorized setting at the resources.

Educational programs and interpretive signs would raise visitor awareness and sensitivity.

Developing areas for Moderate and Low public use would enhance the experience of the general user by limiting commercial tours and allowing increased opportunities for experiencing the cultural resources in a natural setting.

Developing five sites for High public use and four sites for Moderate public use in the national monument would affect recreational opportunities involving cultural resources by increasing access and education programs on 16,000 acres. Limiting motorized access would reduce some user conflicts at the sites. A potential increase in commercial permit use for the sites could increase interaction with large groups at Low public use sites and diminish the recreational experience of some users. Public use on 49,100 acres would remain limited, with no improvements in access or interpretive elements. This lack of improvements would allow users to experience the cultural resources through discovery.

In the Bradshaw-Harquahala Planning Area developing sites for public use in all eight cultural priority areas would increase awareness and recreational opportunities for experiencing the cultural resources on 316,000 acres throughout the planning area. Some user conflicts would be reduced through controlling access of motorized vehicles. The recreation experience of some casual users could be lessened by increased interaction with large groups at sites authorized for group tours.

Alternative C

In Agua Fria National Monument, impacts under *Alternative C* would be similar to those under *Alternative B*, except that one site would be allocated to High public use and eight sites would be allocated to Moderate public use. The total area of public use would be the same. However, developing fewer sites to High public use would decrease the publicity and awareness of cultural resources and limit opportunities for recreation for some users, especially those with mobility challenges. Allocating more sites to Moderate public use would increase opportunities to experience cultural resources in a less developed setting and reduce the potential for interaction with large groups.

In the Bradshaw-Harquahala Planning Area four priority areas, comprising 276,500 acres would be allocated for public use. In these areas

impacts to recreational opportunities would be similar to those under *Alternative B.* The opportunity to experience cultural resources through self-discovery would still exist in the priority areas not allocated for public use. For those areas *Alternative C* would not provide the educational and interpretive opportunities provided by *Alternative B.*

Closing routes that lead to archeological sites in the Black Mesa ACEC would affect the ability of motorized users to access those areas and could lead to fragmentation of the route network. Restricting SRPs to educational tours involving site recording or protection could reduce recreational and educational opportunities for casual users but could lead to better protection and stewardship of sites for long-term preservation.

Alternative D

In Agua Fria National Monument no areas or sites would be developed for High public use. Only one site would be developed for Moderate public use. Awareness of cultural resources would be less under *Alternative D* than under *Alternatives B* and *C.* Opportunities for educational programs, along with the ability to experience the resources in a developed setting, would be eliminated. Lack of facilities could restrict access by certain visitors, especially those with mobility challenges. With limits on tours and group visits in Moderate public use areas, the potential for interaction with large groups would be reduced from that under *Alternatives B* and *C.* The entire national monument would be open for experiencing cultural resources through self-discovery. Opportunities for user conflicts would increase, especially at popular known sites such as Pueblo la Plata and Pueblo Pato, which would not be managed for public use.

In the Bradshaw-Harquahala Planning Area two priority areas, comprising 134,500 acres, would include sites developed for public use. Impacts would be similar to those under *Alternative B.* Educational and interpretive recreational opportunities would be reduced from those under Alternative C because fewer sites would be allocated to public use. Opportunities for self-discovery experiences would increase, as would potential conflict among user types.

***Alternative E* (Preferred Alternative)**

Impacts on recreation resources from cultural resource management would be similar to those described for *Alternative B* except for the following. Potential closing of routes in the planning areas as a protective measure for sites would affect recreational activities, especially where such activities are influenced by the interconnectedness of the route network. Visitor awareness of the cultural resources and of recreational opportunities to experience the resources through improved access and education programs would increase as a result of managing cultural resources in the following areas in the Bradshaw-Harquahala Planning Area:

- Black Mesa/Bumble Bee Cultural Resource Priority Area
- Black Canyon corridor, Lake Pleasant/Agua Fria, Wickenburg/Vulture, Weaver/Octave, Harquahala, and Galena Gulch SCRMAs.

Varying levels of public use development, similar to the levels used in Agua Fria National Monument would limit opportunities and access for some users. However, the levels would also reduce conflicts among user types. Future opportunities for recreation would be maintained by protecting the resources.

In the monument, impacts under *Alternative E* would be similar to *Alternative B* except that two sites would be developed for High public use and six sites for Moderate public use. The total area of public use would be less than *Alternative B* (12,440 acres). Public use limitations on 57,200 acres would increase the impacts over what is described in *Alternative B*.

In the Bradshaw-Harquahala Planning Area developing sites for public use in each cultural

priority area would increase awareness and recreational opportunities for experiencing cultural resources. Although some user conflicts would be reduced by controlling access of motorized vehicles, the recreation experience of some casual users could be impaired by increased interaction with large groups at sites authorized for group tours.

4.14.6 From Paleontological Resource Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

There are no impacts expected. Although including paleontological resources in the Cultural Resource Program could increase awareness recreation opportunities, no paleontological sites are known to exist on BLM's land in the planning areas.

4.14.7 From Recreation Management

***Alternative A* (No Action)**

The increasing use and intensity of non-permitted/dispersed general recreation, and permitted commercial/organized activities, could diminish the recreation experience of some users. Furthermore, it could alter the recreation setting for many activities. The changes in settings could reduce opportunities for certain types of activities, such as hiking, backpacking, non-motorized camping, hunting, and wildlife viewing; especially those in primitive or semi-primitive settings.

Current management is reactive; therefore, prescriptive actions are implemented to solve problems or reduce conflicts as they occur. Moreover, a lack of proactive management for recreation could lead to an overall decline in the quality of recreation as measured by recreation settings, opportunities, and experiences on public lands.

Recreational shooters, equestrians, hikers, bicyclists, campers, hunters, OHV users, mining clubs, and other recreation users would not be directed to areas suitable or compatible for their use. The following problems could increase in all areas, especially near expanding communities:

- heavy uses in sensitive areas,
- overcrowding,
- user conflicts,
- adverse effects on adjacent State and private lands, and
- resource conflicts.

Visitor dispersal seeks to minimize visitor impacts and social conflicts by distributing visitor use to such a large number of sites that no site develops any obvious signs of wear. Sites that are convenient or easy to access might show such signs. Pre-existing sites are more convenient, more comfortable, and require less work to use. The lack of limiting established group sizes could possible affect users because they might have forfeit a natural experience so large groups can settle in close together; which in turn, creates noise, other disturbances, or distractions.

Campfires are now allowed at dispersed campsites in the monument. Some proliferation of fire rings has occurred, though the impact is now low. Collection of dead, down, and detached woody material is allowed for campfire use. Although such fuel is generally scarce, no noticeable impact to woody vegetation has yet occurred.

Recreational target shooting would be allowed throughout Agua Fria National Monument. Many areas which have experienced high levels of such use in the past have been notorious for trash accumulation, including large amounts of spent shell casings. In addition, as visitation has increased, visitors' complaints have escalated along with conflicts between shooters and other visitors. Under the No Action Alternative these conflicts are expected to increase.

Special Recreation Management Areas/Recreation Management Zones

The No-Action Alternative would designate no Special Recreation Management Areas (SRMAs) or Recreation Management Zones (RMZs). Recreational mining clubs, OHV users, campers and other intensive users would not be directed to areas suitable or compatible for their use.

Off-Highway Vehicle Use

Agua Fria National Monument is closed to cross-country motorized travel to protect the monument objects; however, existing routes are open. Specifically, no impacts are likely to occur unless resources are found to be damaged. Closing OHV routes or activity areas to protect resources could limit recreation in some areas, but resources would be protected for future activities.

In the Bradshaw-Harquahala Planning Area 2,240 miles of vehicle routes would remain open, and recreation would not be affected. However, in the western part of the planning area that is covered by the Lower Gila North Management Framework Plan (MFP) (BLM 1983), cross-country travel by some users could affect others, by disrupting recreational and disturbing recreation settings. Additionally, recreation settings would shift over time to more motorized settings and opportunities.

Special Recreation Permits

Current conditions would continue. BLM would continue to issue SRPs on request in both planning areas. Growth in the number of permits requested is expected to meet the increased demand but could lead to overcrowded use areas and conflicts between the public and permit holders. In the Agua Fria National Monument, this increase could quickly result in visitor dissatisfaction as the anticipated impacts from the increased use could negatively impact the recreational experience expected in a national monument. In the Bradshaw-Harquahala planning area, the unlimited growth in the number of permits and the subsequent increased number of users and related impacts would eventually result in unacceptable social encounters and impede the quality of recreational experience for most users if left unmanaged. In some locales such as the Vulture Mountains, San Domingo Wash, Hieroglyphic Mountains, and Black Canyon corridor, requests for permitted commercial and competitive events could encumber all or most weekends during the peak cool-weather visitor season. Visitors not engaged in these permitted activities could be displaced to other areas or have their recreation experiences and expectations diminished. With no limits on the number of motorized competitive races the number of permits could increase to a point where the races would overshadow the casual use and organized group opportunities in the intensive OHV use areas. Consequently, this would result in decreasing recreational opportunities and quality of experience for the average motorized user. In addition, by not confining the use within appropriate use areas, visitors who prefer less intensive OHV uses and more casual rural settings could be displaced as this use moves into areas where they do not currently occur.

Alternative B

Under *Alternative B* Agua Fria National Monument's Front Country RMZ would comprise 57,900 acres and the Back Country RMZ 12,700 acres. Managing Agua Fria National Monument's Back Country RMZ for more primitive recreational opportunities would retain the semi-primitive setting and benefit visitors seeking non-motorized challenge and discovery. Activities such as camping would remain dispersed, and opportunities for solitude would be enhanced because intrusion by vehicles would be minimized. Opportunities for more primitive recreational experiences could be lost, fragmented or decline in some areas of the Bradshaw-Harquahala Planning Area due to increased development and recreation access. More remote areas could retain good to high quality non-motorized or primitive recreation opportunities and experiences.

Managing the Front Country RMZ for more visitor uses would affect opportunities for recreation by concentrating popular and more intensive uses in areas that can tolerate the higher level of use. Concentrating visitors could change the recreation setting to one offering a less primitive experience because of (1) the increased social contact and (2) the required management for more visitors. Impacts from increased noise, litter, and vehicular use would increase in the Front Country RMZ. Access for multiple types of activities would be enhanced and interpretive and educational opportunities would be open to a broad range of visitors.

Impacts to Agua Fria National Monument from dispersed camping would be similar to those under *Alternative A*. However, dispersed camping would be restricted near some facilities such as developed campgrounds, archaeological sites, and water sources. This restriction might slightly reduce the number of sites for dispersed camping and lead to other sites being established by the public. Motorized vehicles might pull off the designated road up to 25 feet. However, this might disturb the campers' solitude if parked along Bloody Basin in a camper unit. Additionally, other vehicles passing might create dust and impair visual clarity.

In contrast to *Alternative A,* campfires would be allowed at dispersed campsites in the national monument with some limitations; for example, only in built fire rings in developed campgrounds. Collecting dead, down, and detached woody material would be allowed for campfires at dispersed campsites.

Two 20-unit campgrounds would be developed at or near the two major access roads into the national monument. The ease of pulling into an established campsite with amenities offers convenience and security. Being close to other campers would enhance security and might also affect the social setting. The developed campgrounds would create a permanent disturbance at the development; however, careful site design would reduce the impacts of the disturbance to soil, vegetation, and visual resources. Developed campgrounds could also attract more visitors to the monument, creating intensified disturbance to wildlife habitat and other resources near the developed campgrounds. Camping opportunities in a developed campground would increase by 40 planned sites.

The impacts of recreational target shooting in the monument under *Alternative B* would be similar to those under *Alternative A*, except that some areas would be closed for the safety of other visitors. Some of the most popular shooting sites are within a half mile of now popular trailheads. Shooters who use these sites (such as the area near the Badger Springs trailhead) would be displaced and would have to move their use to another location. Whether that location might be within the monument is unknown.

Prohibiting material collection and paintball activities in the monument would affect visitors who have traditionally engaged in these activities. Nevertheless, this approach would maintain the landscape in a natural setting for other visitors, especially for cultural resource interpretive and educational programs.

Developing connecting route networks for hikers, bicycles, OHVs, and equestrians would affect recreation opportunities because all types of users could enjoy activities consistently, in more areas, and with fewer user conflicts.

Alternative B would significantly reduce the overall availability of public lands for competitive OHV events. Only the Hieroglyphic Mountains, San Domingo Wash, Vulture Mountains, Table Mesa, and Stanton SRMAs would allow such events, and the number of events would be limited to 16 annually. Management actions applied to the entire Bradshaw-Harquahala Planning Area address a variety of recreation concerns, including public access, target shooting, special recreation permits, organized group activities, and firewood collection. These management actions would do the following:

- reduce impacts on recreation users,

- reduce conflicts between users,
- maintain recreation opportunities and settings, and
- attempt to maintain high-quality dispersed recreation opportunities over the long term.

Special Recreation Management Areas/Recreation Management Zones

Managing 149,760 acres of public land in SRMAs for OHV and intensive recreation would focus BLM's management efforts, as well as allocate some intensive recreation uses to the Hieroglyphic Mountain, Table Mesa, Stanton, San Domingo Wash, Yarnell, Wickenburg, and Vulture Mine SRMAs. BLM would manage SRMAs to ensure that specified recreation opportunities are maintained over the long term and to reduce conflicts between users and other resources. Development of staging areas and facilities would enhance the recreational experience for some users by providing a more developed setting.

Alternative B would significantly reduce the overall availability of public lands for competitive races in comparison to the current situation. Only the Hieroglyphic Mountains, San Domingo Wash, Vulture Mountains, Table Mesa, and Stanton SRMAs would allow races; however, the number would be limited to 14 per year.

Users interested in intensive motorized and group activities would be directed to the Hieroglyphic Mountains, Table Mesa, Stanton, San Domingo, and Vulture Mine SRMAs. Developing staging areas and facilities would enhance the recreational experience for these permitted uses by providing a compatible area for these activities.

Allocating and managing the Yarnell SRMA would affect the hang gliding community by preserving take-off and landing areas for long-term use. Potential hazards would be prevented whenever possible, thereby enhancing the safety and overall experience of users.

Managing the North Black Canyon Trail SRMA would enhance the non-motorized recreation experience in the northern portion of the planning area by providing the facilities for trail use and assuring long-term access to the trail as well as connections to public land to the south and Forest Service land to the north and east.

Off-Highway Vehicle Use

The impacts of OHV management and route closures in ACECs and lands allocated to maintain or enhance wilderness characteristics would slightly reduce the amount of lands open to vehicle-based and motorized recreation opportunities in these areas due to prescribed route closures to achieve recreation settings. The overall effect of route management under *Alternative B* would be to maintain the existing recreation settings and opportunities and avoid greatly changing or diminishing motorized recreation experiences and opportunities throughout the Bradshaw-Harquahala Planning Area.

Special Recreation Permits

In Agua Fria National Monument issuing up to 12 SRPs would represent a four-fold increase from the current condition and could affect the ability of more visitors to access the monument under guided circumstances. The increase could also degrade the recreational experience of other users by (1) increasing their interaction with large groups during many activities and (2) diminishing their opportunity to enjoy experiences in desired settings.

In the Bradshaw-Harquahala Planning Area impacts regarding the number of SRPs issued would be the similar to those described in *Alternative A*. However, in *Alternative B* the number of motorized competitive races would be limited to 14 per year. Although this amount is nearly five times the amount of races currently held in the planning area, annual limits would be set for each SRMA which would spread the potential number of races throughout the five SRMAs allocated for such use. This would minimize potential user conflicts in those

SRMAs and allow diverse OHV opportunities in these areas.

However, the allowable limits in this Alternative could still potentially double the number of competitive races in those management areas where races are currently held. Also, it will keep other areas open and available for races where currently none are held. In these areas, casual users could be affected by a diminished recreational experience in areas near events. The contributing factors include; the noise, the dust, the limitations and closures of routes, the possibility of large numbers of spectators, as well as other factors which could further limit normal use of area resources which increases during the during weekends. Casual users might also be displaced from popular areas because these areas would be inaccessible or unattractive to them during scheduled events. On the other hand, the recreation experience of some visitors might be enhanced by the unexpected opportunity to observe competitive events and interact with other visitors.

Limiting competitive, commercial, and organized group events to allocated VRM standards and recreation settings in the planning areas could limit the total area open to existing events and prevent designating locations for some new events.

Alternative C

In Agua Fria National Monument impacts would be similar those described for *Alternative B.* The Front Country RMZ would occupy 42,410 acres, and the Back Country RMZ would occupy 28,420 acres.

Impacts of dispersed camping in Agua Fria National Monument would be similar to those under *Alternative B,* except in the Front Country RMZ camping would be allowed only at designated dispersed sites. Camping on established designated sites offers visitors less flexibility in choosing a location and encourages the repeated use of a limited number of sites. Designating dispersed sites would ensure that campsite location minimizes impacts to soil, visual, and biological resources. Sites for designation could be selected for their characteristics of minimizing disturbance, while offering the visitor a quality camping experience. Dispersed campsites would no longer proliferate in the Front Country RMZ.

Campfires would be allowed at dispersed campsites in the monument with some limitations; for example, only in built fire rings in the developed campground. Collecting dead, down, and detached woody material would be allowed for campfires at dispersed campsites. The impacts are expected to be the same as under *Alternative A.*

The impacts of one campground development would be similar to those described for *Alternative B*, except there would be 20 fewer sites, and visitors would be concentrated in one place instead of two.

The impacts of recreational target shooting in the national monument would be similar to those under *Alternative B,* except that the entire Front Country RMZ would be closed to shooting. Some of the most popular shooting sites are in the Front Country RMZ as delineated by *Alternative C*. Shooters who use these sites (such as the area near the Badger Springs trailhead) would be displaced and would have to move their use to another location. Whether that location might be within the monument is unknown; however, this use is expected to shift off the monument.

Managing the Agua Fria National Monument's 42,410-acre Back Country RMZ and the Bradshaw-Harquahala lands managed for wilderness characteristics together, would offer visitors primitive recreational opportunities by retaining semi-primitive landscapes and experiences. Impact on users would be the same as described under *Alternative B*, with the exception that larger amounts of land are enclosed by these land use allocations.

Developing connecting route networks for hikers, bicycles, OHVs, and equestrians would benefit recreational opportunities by allowing all types of users to enjoy activities consistently, in more areas, and with fewer conflicts.

Management actions applied to the entire Bradshaw-Harquahala Planning Area would address a variety of recreation concerns, including public access, target shooting, SRPs, organized group activities, and firewood collecting. These actions would do the following:

- reduce impacts on natural and cultural resources,
- resolve conflicts among recreation users,
- maintain recreation opportunities and settings,
- increase public safety, and
- attempt to maintain dispersed high-quality recreation opportunities over the long term.

Special Recreation Management Areas/Recreation Management Zones

The impacts of managing SRMAs would be similar to those under *Alternative B*. Providing staging and trail areas for multiple recreation activities and creating new trails would enhance the recreation experience by increasing opportunities and reducing user conflicts.

Alternative C would significantly reduce the overall availability of public lands for motorized competitive races. Only the Hieroglyphic Mountains, San Domingo, Vulture Mountains and Stanton SRMAs would allow races, and the number would be limited to six per year.

Off-Highway Vehicle Use

The impacts of OHV management and route closures in ACECs and lands allocated to maintain or enhance wilderness characteristics would be similar to *Alternative B*, except more area would be designated as ACECs and WHAs resulting in increased limitations on areas available for motorized recreation.

Special Recreation Permits

Impacts in Agua Fria National Monument would be similar to those under *Alternative B*, except no more than six SRPs would be issued. This figure represents double the number of current permits and could diminish recreational opportunities for some users.

In the Bradshaw-Harquahala Planning Area impacts regarding the number of SRPs issued would be the same as in *Alternative A*, except the number of motorized competitive races would be limited to six per year. The number of races is still twice as many as the number currently held in the planning area which is expected to meet the future demands of users seeking these competitive speed opportunities. As in *Alternative B,* it will keep other areas open and available for races where currently none are held, with the exception of no races being allowed in the Table Mesa SRMA. However, since there has not been a demand for this activity in this SRMA to date, no current use would be displaced. The annual limits set for the Hieroglyphic and Vulture Mountains SRMAs would not increase over current conditions perhaps not meeting the needs for the future increase in races in these areas. This will require additional future races to be moved to less desirable locations and possibly much further away from the Phoenix area. The remaining allowable races would be available in SRMAs that have been allocated for such use; however, these areas may not meet user preferences. In contrast, these limits in each SRMA would minimize potential user conflicts in those areas and allow for more diverse OHV opportunities.

Alternative D

In Agua Fria National Monument, impacts would be similar to those described for *Alternative B,* except the Front Country RMZ would occupy 1,530 acres and the Back Country RMZ would occupy 68,380 acres.

Impacts of dispersed camping in Agua Fria National Monument would be similar to those

under *Alternative C,* except all dispersed camping would be limited to designated dispersed sites. Camping on established designated sites would (1) give visitors less flexibility in choosing a location and (2) would encourage the repeated use of a limited number of sites. Designating dispersed sites would ensure that campsite location minimized impacts to soil, visual, biological, cultural, and other resources. Sites designated available for dispersed camping could be selected for their characteristics of minimizing disturbance while offering recreation visitors a quality camping experience. Proliferating of dispersed campsites would be halted throughout the monument. Vehicles would be allowed to pull off designated roads no more than 15 feet to park for day use. Designated campsites would have designated routes leading to them, thus reducing the disturbance of vehicle pull-offs.

Campfires would be allowed at dispersed campsites in the monument. Visitors; however, could not collect dead, down, and detached woody material for campfires. Wood for campfires would need to be brought in from outside the monument. Denying use of local material for campfires would reduce the disturbance to woody species near the dispersed camping areas. The scarcity of these species and the desire to return the national monument to desert grassland (thereby making woody species even scarcer) makes the impact of this action slight.

Alternative D would prohibit target shooting throughout the monument. Shooters who use sites within the monument would be displaced to sites outside the monument.

Most of the Agua Fria National Monument would be managed under Back Country RMZ prescriptions. About 211,840 acres in the Bradshaw-Harquahala Planning Area would be managed to maintain natural and non-motorized recreational settings to assure the continued availability of areas offering mainly outstanding primitive recreation and solitude opportunities. Limiting and reducing current levels of motorized access would impede the ability of motorized recreational users to travel some secondary routes, washes, single-track cattle paths, and little-used tertiary routes in these nine localities.

Special Recreation Management Areas/Recreation Management Zones

The total area of SRMAs and RMZs in this Alternative is 56,240 acres, of which would be managed for motorized activities. *Alternative D* would phase out motorized uses in Hieroglyphic Mountain SRMA over the planning period. Eventually, *Alternative D* would gradually manage public lands in the southern part of the Castle Hot Spring MU to non-motorized uses to be more compatible with the expected urban growth in the unit. Reducing the area open to motorized activities, especially competitive and organized events, would force the activities to move to other areas. Because most visitors are from the two adjacent counties, new locations in the planning area are likely to be established. Motorized activities at these new locations could increase user conflicts with other recreation and alter the recreation setting for some activities. Moreover, *Alternative D* will only allow two competitive races; both races would be confined to the Vulture Mountains SRMA.

The impacts of managing SRMAs would be similar to those under *Alternative B*. Prohibiting races will slightly lower the number of permits in the SRMAs/RMZs where races are allowed in other alternatives, subsequently requiring less intensive management and monitoring in these SRMAs/RMZs. Providing staging and trail areas for multiple recreational activities and creating new trails would enhance the recreational experience through increased opportunities and reduced user conflicts.

Off-Highway Vehicle Use

The impacts of OHV management and route closures in ACECs and lands allocated to maintain or enhance wilderness characteristics would be the highest under this Alternative.

Alternative D dedicates the most land to non-motorized recreation through designation.

Special Recreation Permits

Issuing no SRPs in Agua Fria National Monument would affect the availability of certain recreational experiences for some users and could reduce the ability of disabled visitors to experience the monument's resources and activities. Eliminating SRPs for conducting guided tours would affect visitors who rely on this conveyance to experience the national monument and interact with others. Eliminating commercial activities would affect recreational opportunities of other users by eliminating the potential for interaction with large groups, especially in highly popular areas.

In the Bradshaw-Harquahala Planning Area impacts regarding the number of SRPs issued would be the same as in the *Alternative A,* except limiting the number of allowable races in this Alternative to two, is less than the current situation of three races per year. However, the most critical impact would be that no races will be allowed in the Hieroglyphic Mountains SRMA which has accommodated this use since the mid 1990's. This would be a severe negative impact to motorized racing enthusiasts by not only moving the only remaining race location much further away from Phoenix, but limiting the racing experience to one SRMA that has less diverse routes available for such use. Racing opportunities and diverse challenges offered these enthusiasts will be lost, and this demand will no longer be met.

***Alternative E* (Preferred Alternative)**

Dispersed camping in Agua Fria National Monument under *Alternative E* would be the same as for under *Alternative B*. Impacts from vehicles engaged in dispersed camping are expected to be similar to those under *Alternative D*.

Campfires would be allowed at dispersed campsites in the monument with some limitations. Collecting dead, down, and detached woody material would be allowed for campfires at dispersed campsites. The impacts are expected to be the same as under *Alternative A*.

Under *Alternative E* target shooting not involving hunting would be prohibited throughout the monument. Impacts would be the same as described under *Alternative D*.

Management actions apply to the entire Bradshaw-Harquahala Planning Area

Special Recreation Management Areas/Recreation Management Zones

Managing 384,510 acres of public land in SRMAs/RMZs would focus BLM's management and also allocate intensive recreation uses to the following SRMA and associated RMZs:

- Black Canyon SRMA,
- Castle Hot Springs SRMA,
- Hassayampa SRMA,
- Hieroglyphic Mountains RMZ,
- Table Mesa RMZ,
- Stanton RMZ,
- San Domingo Wash RMZ,
- Yarnell RMZ,
- Wickenburg Community RMZ, and
- Vulture Mine RMZ.

BLM would manage these areas to ensure that specified recreation opportunities are maintained over the long term and to resolve conflicts between users and other resources. Developing staging areas and facilities would enhance the recreational experience for some users by providing a more developed setting.

Recreationists interested in intensive motorized and group activities would be directed to the Hieroglyphic Mountains, Table Mesa, Stanton, San Domingo, and Vulture Mine RMZs. Motorized events and commercial activities would be entertained at all levels up to potential carrying capacities. These carrying capacities would be determined by Adaptive Management principles through site-specific analysis. Developing staging areas and facilities would

enhance the recreational experience for these permitted uses by providing compatible areas for these activities.

The overall availability of public lands for motorized competitive races would be reduced from the current management situation. Only the Hieroglyphic Mountains, San Domingo, Vulture Mountains and Stanton SRMAs would allow motorized races, and the number would be limited to eight per year.

The allocation and management of the Yarnell SRMA would have the same impacts as those described under *Alternative B.*

Managing the North Black Canyon Trail RMZ would have the same impacts as those described under *Alternative B.*

Off-Highway Vehicle Use

OHV management and route closures in ACECs and lands allocated to maintain or enhance wilderness characteristics to achieve recreation settings would somewhat reduce the amount of lands open to vehicle-based and motorized recreation. Most closures would occur in the lands allocated to maintain or enhance wilderness characteristics in the vicinities of Black Butte, the Belmont Mountains, the Harquahala Mountain, and the Black Butte ONAs.

Special Recreation Permits

Impacts in the national monument would be the same as described in *Alternative A.*

Impacts for the Preferred Alternative are nearly the same as those identified in *Alternative C.* It will keep other areas open and available for races where currently none are held. In these areas the only difference is the limit for the Vulture Mountains RMZ would be increased to four per year. This would double the number of races currently held in the RMZ and is expected to meet the future demand for the area. However, the recreational experience for casual users, most notably the casual use miners, could be affected due to the temporary unavailability of routes and the increased crowds during the race events. Users might also be displaced from the main camping areas because these areas would be either inaccessible or unattractive to them during these events. On the other hand, the recreation experience of some visitors and OHV enthusiasts might be enhanced by the unexpected opportunity to observe competitive events and interact with other visitors.

4.14.8 From Visual Resource Management

***Alternative A* (No Action)**

No impacts are expected.

Alternative B

In the monument, managing the 12,700 acres of Back Country RMZ and 300 acres of Passage RMZ as VRM Class II is consistent with preserving the primitive recreational opportunities intended for the zones. Managing the Front Country RMZ as Class III would allow recreational activities such as OHV use and improvements such as interpretive facilities and parking areas on 57,900 acres but might create visual impacts that could detract from recreational experiences.

In the Bradshaw-Harquahala Planning Area managing the lands allocated to maintain or enhance wilderness characteristics as VRM Class II would affect recreation by retaining the current physical setting of 96,150 acres and enhancing the primitive recreational experience. The improvements at the proposed trailhead in lands allocated to maintain or enhance wilderness characteristics at the staging areas in the Harquahala Mountains would be required to meet design criteria to integrate the color, line, form, and texture of the facilities with the surrounding landscape.

Alternative C

Impacts in Agua Fria National Monument would be similar to those under *Alternative B* except that the Front Country RMZ managed as VRM Class III would be reduced to 42,410 acres and the Back Country and Passage RMZs managed for VRM Class II would increase to 28,490 acres.

In the Bradshaw-Harquahala Planning Area 134,920 acres of lands allocated to maintain or enhance wilderness characteristcs would be managed as VRM Class II and would affect recreational opportunities similarly to *Alternative B*.

Managing Sheep Mountain ONA ACEC as VRM Class I would enhance the visual setting by maintaining 14,500 acres with minimal visual impacts from any proposed projects.

Alternative D

Impacts in Agua Fria National Monument would be similar to those under *Alternative B*, except that the Front Country RMZ managed for VRM Class III would be reduced to 1,530 acres and the Back Country and Passage RMZs managed for VRM Class II would be increased to 69,370 acres.

In the Bradshaw-Harquahala Planning Area impacts would be similar to those under *Alternative B*, except that 226,400 acres of lands allocated to maintain or enhance wilderness characteristics and 142,700 acres in ONA ACECs would be managed as Class I. Such management would enhance the visual landscape by maintaining the areas with minimal to no visual impacts from any proposed developments.

***Alternative E* (Preferred Alternative)**

Impacts in Agua Fria National Monument would be similar to those under *Alternative B*, except that VRM Class III in the Front Country RMZ would be 12,440 acres, 37,560 acres of VRM Class II would be managed in the Back Country and Passage RMZs, and 20,900 acres of VRM Class I would be managed in the area allocated to maintain or enhance wilderness characteristics. These allocations will maintain the natural appearance of the monument landscapes while meeting other resource management objectives.

In the Bradshaw-Harquahala Planning Area impacts would be similar to those under *Alternative B* except that 55,480 acres of lands allocated to maintain or enhance wilderness characteristics would be managed as VRM Class II and 104,690 acres in ONA ACECs would be managed as VRM Class I. This management would benefit recreation by maintaining the areas with little to no visual impacts from proposed developments, which would maintain or enhance the landscape's natural appearance and open space value, while meeting other resource management objectives.

4.14.9 From Rangeland Management

***Alternative A* (No Action)**

As recreation use increases, conflicts with livestock grazing and operators would likely increase. Impacts to recreation could include lack of access for recreation activities as livestock operators close their private lands to reduce conflicts and vandalism. This lack of access would contribute to (1) a loss of recreation areas on public land due to a lack of access and (2) a reduction in route network connectivity. Some visitors would be bothered by waste, cattle trailing, trampled vegetation, and denuded areas near fences and facilities.

Alternative B

Limiting grazing in Agua Fria National Monument riparian areas to the winter season (November 1 to March 1) would degrade the recreational experience, especially in the Back Country RMZ. The primitive recreational experience would be enhanced for the summer season because of reduced interaction with

livestock. However, because of high summer temperatures, winter is the season when most people visit the monument. Encounters between visitors and livestock during winter would increase in riparian areas. Fencing and physical control measures required to keep livestock out of the riparian areas could detract from the visual setting of primitive landscapes and diminish the recreational experience.

Fewer potential conflicts with livestock could also occur in the Front Country RMZ during summer, but the fencing and physical control improvements could disrupt the vehicular route network, restrict accessibility for people with disabilities, and diminish the recreation experience for those users. Improved riparian conditions would enhance the recreation setting for hunting, nature study, and wildlife and bird watching.

In the Bradshaw-Harquahala Planning Area riparian impacts would be similar to those in Agua Fria National Monument. Improved vegetation conditions would improve the recreation setting for hunting, nature study, and wildlife and bird watching. Some visitors would be bothered by waste, cattle trailing, denuded areas, livestock facilities, and trampled vegetation in riparian and upland areas. Others visitors would not notice.

Alternative C

In Agua Fria National Monument the permanent removal of livestock from the riparian area would eliminate potential conflicts with cattle and enhance the primitive and nonprimitive recreational experience in those areas. Fencing and physical controls of livestock would have impacts similar to those under *Alternative B*. Impacts in the Bradshaw-Harquahala Planning Area would be similar to those under *Alternative B*.

Alternative D

Opportunities for recreation on public lands in both planning areas would benefit from the end of grazing. The potential for conflicts with livestock would be eliminated. Both motorized and primitive recreation experiences could improve as recreation settings become free of livestock facilities, cow waste, denuded areas, trampled vegetation, and the evidence of trailing. Access to some public lands could be lost if ranchers sell their private property. The number of areas where ranchers have traditionally permitted public access across private land could decline, making some public land inaccessible, particularity around Castle Hot Springs and Hieroglyphic Mountain, areas notable for interspersed private ranch and BLM lands.

***Alternative E* (Preferred Alternative)**

Impacts are expected to be the same as those described for *Alternative B*.

4.14.10 From Minerals Management

***Alternative A* (No Action)**

Expected increases in visitor use in the Bradshaw-Harquahala Planning Area could lead to increased conflicts with mining. Mining in popular, high-use recreational areas would diminish opportunities for recreation and increase recreation in other areas as users seek new locations for activities. Mining in previously undisturbed areas would reduce opportunities for primitive recreation and change the setting to a more developed landscape.

The Lower Gila North MFP (BLM 1983) prevents “segregation” of minerals for withdrawal and keeps the planning area covered by the plan open to all mineral resource development. Because the potential for leasable and locatable minerals is very low, most impacts would result from developing saleable minerals. Designated wilderness areas and Agua Fria National Monumentaan area of 172,510 cres--are closed to mineral material disposal.

Alternative B

Closing lands allocated to maintain or enhance wilderness characteristics and ACECs to mineral material disposal would improve recreational opportunities and settings on 268,260 acres. The critical physical setting would be retained, and opportunities for more primitive recreation would be enhanced. Because of very low potential, there would be no impacts from leasable minerals management and few impacts from locatable minerals management. Managing lands open to minerals to VRM Class III or IV could affect recreational experiences in adjacent areas. Mineral development would be more visible in the landscape and could alter the recreational experience of some visitors by introducing human-caused elements to the landscape.

Alternative C

Impacts would be similar to those under *Alternative B* except that closures to mineral material disposal would include 325,970 acres. Minerals projects would be managed to the VRM class for which they were inventoried. Visual settings would be better maintained because mining projects would be consistent with viewshed management objectives.

Alternative D

Impacts would be similar to those under *Alternative B* except that 469,680 acres would be closed to mineral material disposal. Closures would ensure the retaining of recreation opportunities in undisturbed natural settings over the largest area under any of the alternatives.

***Alternative E* (Preferred Alternative)**

Impacts would be similar to those under *Alternative B*, except that 172,780 acres would be closed to mineral material disposal. Closures would ensure the retaining of high-quality primitive recreation opportunities in undisturbed natural settings.

4.14.11 From Fire Management

***Alternative A* (No Action)**

Under *Alternative A* current conditions would be maintained. Prescribed burns would affect the availability of recreation activities in Agua Fria National Monument because some areas would be closed during planned burning. The enhanced habitat and general landscape setting gained through the burns would benefit recreational experiences by improving visual settings and possibly increasing wildlife abundance for viewing and hunting.

Visitors generally do not view burned areas--caused either by prescribed or natural ignition--as attractive settings for recreation. These users would be displaced for varying lengths of time from burned landscapes and would probably go to other nearby unburned areas. The burned localities would provide transient opportunities to interpret the role of natural and prescribed fires in the landscape.

***Alternatives B, C, D,* and *E* (Preferred Alternative)**

Impacts would be similar to those under *Alternative A*, except that natural fire starts would be allowed to burn in the prescribed burn areas. This practice could increase opportunities for fires to start during each season because only planned, human-set fires are now allowed to burn. More fire starts could increase disruptions to recreation by increasing the instances of area closures.

4.14.12 From Wild Horse and Burro Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

There are no impacts expected.

4.14.13 From Management of Transportation and Public Access

***Alternative A* (No Action)**

OHV and other mechanized users would not be directed to routes or areas suitable or compatible for their use. Heavy OHV uses in sensitive areas, overcrowding, user conflicts, adverse effects on adjacent State and private lands, and resource conflicts could increase in all areas, especially near expanding communities:

Motorized route-based recreation opportunities currently available would be generally unchanged. Most existing routes would remain open within the Agua Fria National Monument, but the monument would remain closed to cross-country motorized travel. No closures would be anticipated unless resources are found to be damaged. Closing OHV routes or activity areas to protect monument resources could limit motorized recreation in some areas.

In the Bradshaw-Harquahala Planning Area 2,240 miles of vehicle routes would remain open, and recreation would not be affected. In the western part of the planning area that is covered by the Lower Gila North Management Framework Plan (MFP) (BLM 1983), cross-country travel by some users could affect others by disrupting recreational and disturbing recreation settings. Recreation settings would shift over time to more motorized settings and opportunities.

Alternative B

140 miles, or 76.5 percent, of routes would remain open to vehicular travel in Agua Fria National Monument. The route system would enhance opportunities for motorized recreation by creating loop trails, which would allow connected touring, provide for an increase in access, and offer extended recreational opportunities. About five miles of new routes would be developed to bypass private property and maintain the connectivity of the route system. The route system would close 38 miles of existing routes and could diminish opportunities for motorized recreation in some areas. Users of these routes would be displaced to other areas within and outside the monument.

Up to 48 miles of route in the Bradshaw-Harquahala Planning Area would be closed in ACECs and lands allocated to maintain or enhance wilderness characteristics. The closures would affect and displace motorized recreational opportunities for traditional users of those routes. The recreational experience of non-motorized users would be enhanced through more opportunities to experience solitude and to participate in recreational activities in a natural and non-motorized setting.

In the remainder of the planning area 2,086 miles, or 98 percent, of routes would remain open. A total of 168 miles of routes would be closed elsewhere to (1) protect resources, (2) reduce redundancy, and (3) limit routes for administrative use. And 14 miles of new routes would be established to mitigate losses from the closures and to achieve better route connectivity. The total distance of open routes would be 2,100 miles. The closures represent 7.4 percent of the routes in the planning area.

Limiting all mechanized vehicles to inventoried routes before completing the route designation process (i.e. within 5 years of plan approval) would eliminate cross-country OHV travel throughout the planning area. According to the AGFD *Off-Highway Vehicle Strategic Plan* (AGFD 1998), cross-country travel accounts for five percent of OHV activities. Accordingly, this limitation would not affect most OHV users. Cross-country travel would also be prohibited for game retrieval, potentially diminishing or eliminating hunting opportunities.

Restricting all motorized and non-motorized vehicles to existing routes would not affect current activities but would prevent developing new routes to expand the recreational experience. Allowing cross-country travel only

for non-motorized, wheeled game carriers (small two-wheeled carts for transporting game) could affect the recreational experience for some hunters by limiting their opportunities to hunt in areas where retrieval of game would require travel over long distances.

Enacting specific route, wash, or area closures in lands allocated to maintain or enhance wilderness characteristics and Tule Creek ACEC would affect the recreational experience and opportunities of motorized users. Route closures would diminish opportunities for traditional users. Area closures could disconnect multiple routes in the network. Protecting biological and cultural resources through the closures would maintain resources and preserve the natural setting for future recreational opportunities.

Connecting route networks would be developed for hikers, bicycles, OHVs, and equestrians enhance recreation experiences and opportunities with fewer user conflicts. Developing connecting route networks for hikers, bicycles, OHVs, and equestrians would affect recreation opportunities because all types of users could enjoy activities consistently, in more areas, and with fewer user conflicts.

Users interested in intensive motorized trail activities would be directed to the Hieroglyphic Mountains, Table Mesa, Stanton, San Domingo, and Vulture Mine SRMAs.

Managing the North Black Canyon Trail SRMA would enhance the non-motorized recreation experience in the northern portion of the planning area.

The closure of routes crossing sensitive wildlife areas or movement corridors would diminish motorized recreation opportunities. Opportunities for wildlife viewing could be enhanced because wildlife would be able to move through their traditional corridors.

Opportunities for trail-based individual, organized group and special motorized recreation uses could be lessened by restricting use or limiting development of new routes in areas managed for desert tortoise habitat, especially for motorized uses from October 15 to March 31 in Category I and II desert tortoise habitats.

Alternative C

In Agua Fria National Monument 129 miles, or 69.7 percent, of routes would remain open to vehicular travel. The route system developed under *Alternative C* would create loop trails for motorized touring and add new routes to bypass private property. About six miles of new routes would be developed and would affect recreation opportunities by maintaining route connectivity in the event of closures across private land. The route system would close 50 miles of existing routes and could diminish opportunities for motorized recreation in some areas.

The impacts on opportunities for recreation in the Bradshaw-Harquahala Planning Area would be similar to those under *Alternative B*, except the model route system for *Alternative C* would close 382 miles of routes, mainly in ACECs and lands allocated to maintain or enhance wilderness characteristics. In the rest of the planning area 1,889 miles of routes would remain open, and 382 miles of potential closures would be mitigated by up to 26 miles of new routes. The total distance of open routes would be 1,915 miles or 15 percent less than the existing routes and nine percent less than in *Alternative B*.

The recreational experience and opportunities of motorized users would be affected by imposing potential restrictions in eight ACECs and by enacting specific route, wash, or area closures in lands allocated to maintain or enhance wilderness characteristics. Route closures would diminish opportunities for traditional users, and area closures could result in the disconnection of multiple routes in the network. Protecting biological and cultural resources through the closures would maintain resources and preserve the natural setting for future recreation opportunities.

Under *Alternative C* vehicles would be allowed to pull off designated roads no more than 15 feet to park for day use or for dispersed camping. This requirement would reduce the disturbance of vehicle pulloffs. However, it might require visitors (1) to camp closer to vehicle routes in less desirable areas or (2) to carry their camping gear to more desirable locations further from designated vehicle routes.

Developing connecting route networks would have the same impacts as *Alternative B.*

Limiting routes in pronghorn corridors in Agua Fria National Monument could reduce the connectivity of the route network and diminish the motorized recreation experience of some users.

Prohibiting new fences in the Belmont/Big Horn Mountains and Date Creek Mountains WHA areas, and the Upper Agua Fria River Wildlife Habitat Corridor would maintain the current connectivity of the route network.

Closing or limiting vehicle routes in the Belmont/Big Horn Mountains WHA area and in the Harquahala/Belmont/Big Horn Wildlife Corridor could affect the connectivity of the route network and diminish the recreational experience and opportunities for motorized users. Prohibiting the building of new routes in the Date Creek Mountains WHA area and the Upper Agua Fria River Habitat Corridor could lessen motorized recreation opportunities by preventing maintenance of route connections when other routes are closed for resource protection. Fragmented route systems could diminish the recreational experience for some users and possibly lead to an increase in unauthorized cross-country travel to connect routes.

Impacts from desert tortoise restrictions would be the same as those identified in *Alternative B.*

Alternative D

In Agua Fria National Monument 47 miles, or 27.8 percent, of routes would remain open to vehicular travel. The route system under *Alternative D* was developed mainly for resource protection and would not add new routes. Opportunities for motorized recreation would be limited, and loop trails would not be developed. The route system would close 122 miles of existing routes and could diminish opportunities for motorized recreation and public access in some areas. Opportunities for non-motorized recreation would be enhanced throughout the monument. There would be more opportunity to experience solitude and natural landscape settings.

The impacts of route designations on recreational opportunities in the Bradshaw-Harquahala Planning Area would be similar to those under *Alternative B*. The model route system for *Alternative D*, however, would close 412 miles of routes in ACECs and lands allocated to maintain or enhance wilderness characteristics. In addition, routes might be closed in other allocations to meet resource management objectives and settings. In the rest of the planning area 1,645 miles of routes would remain open, and 723 miles of potential closures would be mitigated by developing 62 miles of new routes. The total distance of open routes would be 1,707 miles, representing a loss of 24 percent of the existing routes.

Impacts from route limitations and development of sites for recreation in the pronghorn corridors in Agua Fria National Monument to those under *Alternative C*.

Removing all fences and prohibiting new ones in Agua Fria National Monument would maintain connectivity in the motorized route system developed for *Alternative D*.

ACEC designations could limit motorized recreation developments and restrict activities, diminishing the recreation experience of some users.

Impacts from desert tortoise restrictions would be the same as those identified in *Alternative B*.

***Alternative E* (Preferred Alternative)**

The route network in the monument under the preferred alternative would retain 101 miles of existing route and construct one mile of new route to enhance connectivity.

About 12 miles of primary roadways exist in Agua Fria National Monument. These include Bloody Basin Road, which leads visitors through the national monument's heart, and the Badger Springs exit of Interstate 17, a road that leads visitors to a trailhead. Beyond the primary road network, 88 miles of secondary and tertiary roads would be designated as open. Closing 70 miles of route in pronghorn corridors and other habitat in the national monument could affect the connectivity of the route network and diminish the motorized recreation experience of some users. The closure would also increase the area in which visitors could have a semi-primitive non-motorized recreation experience. Pronghorn habitat concerns were considered as part of the evaluation process for designating the route network as developed for this alternative. About 41 percent of routes in Agua Fria National Monument would be closed, limiting vehicle-based hunting; camping; and cultural, scenic, and wildlife viewing opportunities.

Under the model route system for the Bradshaw-Harquahala Planning Area 114 miles of routes in ACECs and lands allocated to maintain or enhance wilderness characteristics would be closed. The closures would affect and displace motorized recreational opportunities for traditional users of those routes. The recreational experience of non-motorized users would be enhanced through more opportunities to experience solitude and to participate in recreational activities in natural and non-motorized settings. Within ACECs and lands allocated to maintain or enhance wilderness characteristics 179 miles, or 61.3 percent, of routes would remain open.

A total of 211 miles of routes would be closed to protect resources, to reduce redundancy, and to limit routes for administrative use.
And 39 miles of new routes would be established to mitigate losses from the closures and to achieve better route connectivity. The total length of open routes would be 2,028 miles. The closures represent nine percent of the routes in the planning area.

OHV management and route closures in ACECs and lands allocated to maintain or enhance wilderness characteristics to achieve recreation settings would somewhat reduce the amount of lands open to vehicle-based and motorized recreation. Most closures would occur in the lands allocated to maintain or enhance wilderness characteristics in the vicinity of Black Butte and within the Belmont Mountains and in the Harquahala Mountain and Black Butte ONAs.

Limiting all mechanized vehicles to inventoried routes before completion of the route designation process (i.e. within five years of plan approval) would eliminate cross-country OHV travel throughout the planning area. According to the AGFD *Off-Highway Vehicle Strategic Plan* (AGFD 1998), cross-country travel accounts for five percent of activities. Accordingly, this limitation would not affect most OHV users. Cross-country travel would also be prohibited for game retrieval, potentially diminishing or eliminating hunting opportunities for some hunters.

Prohibiting new fences in the Belmont/Big Horn Mountains WHA would help maintain the current connectivity of the route network and enhance the unencumbered travel of motorized visitors.

Closing or limiting vehicle routes in the Belmont/Big Horn Mountains WHA area, the Harquahala/Belmont/Big Horn Wildlife Corridor, and the Harquahala Mountains and Black Butte ONAs could affect the connectivity of the route network and diminish the recreational experience and opportunities for motorized users. Motorized users could be displaced or could permanently lose these opportunities.

Prohibiting the building of new routes in WHA areas and ACECs could affect motorized recreation opportunities by preventing maintenance of route connections when other routes are closed for resource protection. Moreover, new routes could not be built to satisfy the public demand for more interesting, challenging, and long-distance route systems and loops. Fragmented route systems could diminish the recreational experience for some users and possibly lead to an increase in unauthorized cross-country travel to connect routes.

Developing connecting route networks for hikers, bicycles, OHVs, and equestrians would benefit recreational opportunities because all types of users could enjoy activities consistently, in more areas, and with fewer interruptions. Once completed, the Black Canyon Trail from the Carefree Highway to north of Highway 69 would become a major trail of regional significance for mountain bikers, equestrians, and hikers. Moreover, the trail would link the communities of the Black Canyon corridor and the north boundary of the Phoenix-Peoria metropolis.

Recreationists interested in intensive motorized and group activities would be directed to the Hieroglyphic Mountains, Table Mesa, Stanton, San Domingo, and Vulture Mine RMZs.

Managing the North Black Canyon Trail RMZ would enhance the non-motorized recreation experience in the northern portion of the planning area by providing the facilities for trail use and assuring long-term access to the trail as well as connections to public land to the south and Forest Service land to the north and east.

Impacts from desert tortoise restrictions would be the same as those identified in *Alternative B*.

4.14.14 From Management of Wilderness Characteristics

***Alternative A* (No Action)**

Under *Alternative A* no areas would be managed specifically to maintain or enhance wilderness characteristics. Existing primitive recreation opportunities would probably be maintained in Agua Fria National Monument due to the management guidelines defined by the proclamation (Appendix A).

In some areas of the Bradshaw-Harquahala Planning Area opportunities for primitive and non-motorized types of recreation would likely decline or become more fragmented over the life of the plan due to increasing motorized recreation and land use authorizations. Lands with semi-primitive non-motorized recreation settings and opportunities could decline in number and area. Wilderness characteristics would not greatly change over the life of the plan in the more remote parts of the Bradshaw-Harquahala Planning Area.

Alternative B

In the Agua Fria National Monument, no impacts are expected.

In the Bradshaw-Harquahala Planning Area 56,040 acres of land would be managed to maintain or enhance wilderness characteristics. Designation of these areas would impede the ability of motorized recreational users to access washes, single-track cattle paths, and little-used tertiary routes in these areas. Motorized recreationists would be displaced and forced to travel to nearby areas and routes offering motorized opportunities. Additional camping and off-road driving impacts on soils and vegetation would accrue along these periphery areas and routes, impacting scenery. More crowded motorized routes would make the driving experience less solitary and more interactive with more encounters with other motorized users. The number of social contacts between motorized users would reduce the quality of dispersed recreational experiences for some visitors.

Non-motorized users would benefit from the limitation on vehicles in areas designated to manage or enhance wilderness characteristics by being able to recreate in a more natural setting. This would assure the maintenance and availability of areas offering mainly outstanding primitive recreational and solitude opportunities.

Alternative C

In Agua Fria National Monument no impacts are expected.

In the Bradshaw-Harquahala Planning impacts would be the same as *Alternative B* except that 107,510 acres of land would be managed to maintain or enhance wilderness characteristics. This increased number of acres could create more displacement of motorized recreationists than *Alternative B*.

Designation of a larger amount of area to manage for wilderness characteristics would provide non-motorized users more recreational opportunities than *Alternative B*.

Alternative D

In Agua Fria National Monument, no impacts are expected.

The impacts of managing lands in the Bradshaw-Harquahala Planning Area allocated to maintain or enhance wilderness characteristics would be similar to those under *Alternative B* and *C*, except that the total area of public lands affected would be 91,480 acres. *Alternative D* would designate some of the lands identified to maintain or enhance wilderness characteristics described in *Alternatives B* and *C* as ONA ACECs. Impacts for ACECs are described in the *Special Area Designations* section 4.6.

***Alternative E* (Preferred Alternative)**

In Agua Fria National Monument no impacts are expected.

In the Bradshaw-Harquahala Planning Area impacts would be the same as *Alternative B* except that 96,420 acres of land would be managed to maintain or enhance wilderness characteristics. This increased number of acres could create more displacement of motorized recreationists than *Alternative B*.

Designation of a larger amount of area to manage for wilderness characteristics would provide non-motorized users more recreational opportunities than *Alternative B* but not as much as *Alternative C*.

4.15 Impacts on Visual Resource Management

Analytical Assumptions/Data Summary

BLM evaluates impacts on visual and scenic resources on a case-by-case basis when considering land use authorizations. The RMP would establish VRM classes from the inventory developed during the planning process. The basic descriptions of the class objectives are outlined below; the results of the inventory are shown in Map 3-7.

- VRM Class I Objective: The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes, but it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.
    - Generally, the impact of implementing VRM Class I is that the scenic character of those lands are preserved as viewed from the key observation points selected when any management activity is proposed. In the long term, the aesthetics of VRM

Class I landscapes are maintained as natural views.

- VRM Class II Objective: The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities might be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
    - VRM Class II does not provide quite the level of protection to visual landscapes as Class I. The usual affect of Class II is to maintain visual landscapes in a natural appearance. But, since management activities can be seen in this standard - although they would not be allowed to attract attention - the character of visual landscapes could degrade over time.
- VRM Class III Objective: The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities might attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
    - VRM Class III allows management activities to be visible and they could attract attention of casual observers, though they shouldn't dominate the view from the selected key observation points. This Class allows continuation of existing and development of new needed activities, such as utility lines, mineral material sales, and other activities with visible surface disturbance. The long term affect on the visual landscape is generally a degradation of its natural appearance.
- VRM Class IV Objectives: The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities might dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.
    - VRM Class IV is designed to allow management activities that can result in major modifications of the visual landscape. The effect of VRM Class IV can be a rapid and quite large modification to the visual landscape from as few as one proposal. An example could be development of a major open pit mine. Yet, even within VRM Class IV allocations, BLM will negotiate with project proponents to try to minimize the visual intrusion of any project proposal.

Table 4-6 shows the area of each VRM class in the planning areas as found during the inventory and the area of each class for each alternative. The total area of each class is reported as the acres of that class on BLM. The VRM inventory process assesses the visual character of the entire landscape, but management to meet VRM class objectives would apply only to BLM lands. When VRM classes are in place, visual resource evaluations are addressed in the environmental reports prepared for each proposed project. These evaluations would employ the contrast rating process as described by BLM Manual 8430.

4-6. VRM Classes by Alternative (BLM acres)

Class	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E (Preferred)
I	96,820	96,820	109,570	298,310	98,820
II	0	486,800	502,610	340,880	488,250
III	870,180	284,720	260,020	220,790	278,540
IV	0	98,660	94,800	107,020	103,390

4.15.1 From Special Area Designations

***Alternative A* (No Action)**

Under current management present conditions would be maintained, and no visual resource classes would be in place. BLM would evaluate future projects for visual impacts, but would give no guidance as to whether projects are consistent with area values. As such, no impacts on VRM are expected from special area designations.

Though no VRM classes were allocated in past plans, the nonimpairment standard for the eligible Wild and Scenic river segments within the national monument would be managed to maintain the current visual character. Proposed activities within these corridors would be restricted from degrading the character of the river corridor from the conditions that made it eligible for wild designation. Some management activities may be precluded. In the Larry Canyon and Perry Mesa ACECs, no VRM standards were set by previous plans and they have been managed to VRM Class III standards. Continued management in this VRM Class could result in a steady decline of visual character as activities could be seen in the landscape, though they couldn't dominate views from key observation points. Eventually, the character of the currently intact cultural landscapes within the Perry Mesa ACEC could be lost because there is no prescription or standard to preserve it.

In the Bradshaw-Harquahala Planning Area, five wilderness areas (totaling 96,820 acres) would be managed by policy to VRM Class I standards. VRM Class I would allow preservation of the scenic landscapes within the wilderness areas consistent with management to preserve naturalness and areas with few human intrusions. The Harquahala Mountain Summit Road Back Country Byway has not been allocated to a VRM Class and has no prescription or standards defining management of the visual landscape. As a result, it would be managed at VRM Class III standard, which could allow an eventual degradation of the visual character by allowing visual intrusions into the landscape.

Alternative B

In Agua Fria National Monument, management of WSR corridors generally prohibits or minimizes uses and activities that could affect visual resources. Management to protect the values for WSR would thus preserve visual quality along the river. Designating the Bloody Basin Road as a Back Country Byway would include the possibility of facilities such as vehicle pull outs and information kiosks for visitor enjoyment. These would be designed to conform to the local visual landscape and to be visually pleasing. Impacts from Back Country Byway designation are expected to be very low. The Larry Canyon and Perry Mesa ACEC designations would be dropped. Removing these designations should not affect visual resources because the national monument's current management provides for a higher level

of protection than ACEC designation, thereby preserving the existing scenic quality.

In the Bradshaw-Harquahala Planning Area retaining the Harquahala Mountain Summit Road would not affect the existing scenic quality. Retaining the visual character of the surrounding landscape would be important to maintain the current recreation experience offered by the scenic route. Wilderness areas would remain VRM Class I areas.

Designating Tule Creek ACEC (640 acres) in the Bradshaw-Harquahala Planning Area could also affect visual resources. In the ACEC more fences built to restrict livestock grazing and motor vehicles could alter the visual landscape. Withdrawing the ACEC from mineral entry would benefit visual resources by limiting the opportunity for mines and improvements to alter the visual landscape. Developing interpretive sites and implementing protective measures, such as installing fences or barriers, could lower the scenic quality of these areas.

Alternative C

In Agua Fria National Monument, impacts of managing WSR corridors would be the same as for *Alternative B*.

Four ACECs (totaling 810 acres) would also be designated in Agua Fria National Monument. These designations could result in actions degrading visual resources by altering the landscape with fences to eliminate livestock grazing. Impacts would also result from closing, limiting, or mitigating motorized vehicle routes. Such actions could improve visual quality by minimizing disruptive recreation and restoring the natural landscape in some areas.

In the Bradshaw-Harquahala Planning Area, impacts of retaining the Harquahala Mountain Summit Road would be the same as for *Alternative B*. The five designated wilderness areas would not be affected.

Seven ACECs, totaling 55,710 acres, would be designated in the Bradshaw-Harquahala Planning Area. These designations could result in minor management actions. The actions, in turn, would slightly affect visual resources by altering the landscape with fences (1) to exclude livestock and motorized vehicles and (2) to protect cultural sites. The following actions would help maintain scenic quality by minimizing opportunities for disturbances to the natural landscape:

- prohibiting mineral development (all forms of mineral entry or mineral material disposal);
- closing, limiting, or mitigating motorized vehicle routes that conflict with maintenance of wildlife habitat and cultural resources;
- not allowing the building of new recreational sites; and
- prohibiting construction of grazing improvements in certain areas.

Alternative D

In Agua Fria National Monument, impacts of managing WSR corridors would be the same as for *Alternative B*.

Alternative D would designate the Agua Fria River Riparian Corridor ACEC in the monument. The ACEC would encompass 13,070 acres and would represent a large increase in special area designation over *Alternatives B* and *C*. Impacts from the ACEC management could result from closing, limiting, or mitigating motorized vehicle routes that conflict with maintenance of riparian and wildlife values. These actions could improve visual quality by minimizing opportunities for disruption, although general management for protecting the Purpose and Significance of the monument already affords a similar level of protection. Acquiring lands along Indian Creek could enhance scenic quality by enabling BLM to manage newly acquired parcels in accordance with proposed VRM standards.

Alternative D would designate the Agua Fria River Riparian Corridor ACEC in Agua Fria National Monument. The ACEC would encompass 13,070 acres and would represent a large increase in special area designation over *Alternatives B* and *C*. Impacts from the ACEC management could result from closing, limiting, or mitigating motorized vehicle routes that conflict with maintenance of riparian and wildlife values. These actions could improve visual quality by minimizing opportunities for disruption. But general management for protecting the Purpose and Significance of the Agua Fria National Monument would afford a similar level of protection for the area and would limit disruptive activities. Acquiring lands along Indian Creek could enhance scenic quality by enabling BLM to manage newly acquired parcels in accordance with proposed VRM standards.

In the Bradshaw-Harquahala Planning Area, impacts of retaining the Harquahala Mountain Summit Road would be the same as for *Alternative B*.

Eight ACECs (totaling 314,580 acres) would be designated. Impacts on visual resources from these ACECs would be similar to those described for *Alternative C*, except that the protected area would represent more than a threefold increase over the area protected under *Alternative C*. Other impacts to visual resources could result from closing an entire ACEC to motor vehicles, thereby allowing existing vehicle routes to reclaim and disappear into the landscape. The Wilderness areas would remain under VRM Class I.

***Alternative E* (Preferred Alternative)**

In Agua Fria National Monument the WSR eligibility would be retained. Impacts would be the same as described for *Alternative B*.

In the Bradshaw-Harquahala Planning Area retaining the Harquahala Mountain Summit Road Back Country Byway and designating the Constellation Mine Road/Buckhorn Road as a back country byway would have impacts similar to those described under *Alternative B*.

In the Bradshaw-Harquahala Planning Area four ACECs (totaling 89,970 acres) would be designated. Impacts on visual resources from these ACECs would be similar to impacts described for *Alternative C*.

4.15.2 From Lands and Realty Management

***Alternative A* (No Action)**

Under the current management of Agua Fria National Monument some potential impacts to visual resources are expected from lands and realty management. Land acquisitions would be evaluated for visual resource management under a project-specific environmental review. Land disposal is prohibited by the national monument proclamation (Appendix A). New utility proposals such as power lines or pipelines could affect the visual character of the landscape by the adding facilities and ground-disturbing activities. New towers would be built for power lines, and pipeline construction would disturb the ground along the pipeline route. The impacts would generally be limited to the western area of the monument where there are existing visual impacts from previous utility projects developed before the national monument's designation.

Under the current management of the Bradshaw-Harquahala Planning Area no impacts to visual resources are expected from land acquisition. Acquisitions would be evaluated for visual resource management under a project-specific environmental review. Land disposals of up to 54,370 acres could affect visual resources by eliminating BLM's management control over the parcels. Future utility, mining, or development projects would no longer be required to conform to existing or "default" VRM class standards. Developing disposed parcels for residential, commercial, or recreational uses would diminish the open space setting of the remaining adjacent public lands.

Aesthetically incompatible or obtrusive projects could be introduced onto the public lands by the following:

- land use authorizations,
- easements,
- supporting access to or use of valid existing rights, and
- meeting access and utility needs.

These projects and authorizations could degrade or mar the recreation settings, viewsheds, and open space qualities of public lands.

Alternative B

In both planning areas visual resources would benefit from land acquisitions because newly acquired parcels would be inventoried and managed according to BLM's VRM system. Land disposal could impair visual resources by eliminating BLM's management control over the disposed parcels.

Adding designated utility corridors could affect visual resources by increasing the potential installation of utility poles and power lines, as well as ground disturbance along pipeline routes. Before construction; however, future corridor projects would undergo an environmental review that would analyze visual resources. Narrowing the existing utility corridor in Agua Fria National Monument could also affect visual resources by confining new utilities to areas already visually affected by existing utilities, thereby retaining undisturbed visual landscapes. A corresponding expansion of the corridor one mile west would potentially extend utility impacts into the Bumble Bee area and to sites visible from the Sunset Point Scenic Overlook.

Adding communication infrastructure could impair visual resources by altering the visual landscape. Before construction; however, future telecommunication infrastructure projects would undergo environmental review that would analyze impacts on visual resources. Requiring projects to be designed in keeping with the VRM class in which they occur would minimize impacts on the visual landscape.

Impacts of land disposal in the Bradshaw-Harquahala Planning Area would be similar to *Alternative A*, except 58,400 acres have been determined to be suitable for disposal.

In response to projected regional transportation demand, all highway system routes (interstates, U.S. routes, and Arizona State routes) and the proposed corridor southwest of Wickenburg are designated as transportation corridors in the Bradshaw-Harquahala Planning Area. The proposed Wickenburg Bypass corridor, which would mainly cross lands managed for VRM Class II level management, would be inconsistent with VRM objectives for the area and would interfere with BLM's ability to manage this area's visual resources.

Alternative C

Impacts to visual resources from land and realty management would be similar to those discussed for *Alternative B* except as described below.

Eliminating the existing utility corridor in Agua Fria National Monument could affect visual resources by eliminating the possibility of installing new utilities. This constraint would preserve the existing visual landscape and preclude future impacts on the viewshed. Expansion of the corridor two miles west could extend impacts of utility development even further into the Bumble Bee area and into the line of sight from the Sunset Point Scenic Overlook, but may also give enough room within the corridor to site any utility so its impact was either screened from view or minimized.

Impacts of land disposal in the Bradshaw-Harquahala Planning Area would be similar to *Alternative A*, except *Alternative C* would decrease the lands found suitable for disposal to 49,100 acres, 9,300 acres less than proposed under *Alternative B*.

Impacts to visual resources from transportation corridors would be similar to those described for *Alternative B*.

Alternative D

Impacts to visual resources from land and realty management actions would be similar to those discussed for *Alternative B* except as described below.

Impacts in Agua Fria National Monument from utility corridors would be similar to those under *Alternative C*.

In the Bradshaw-Harquahala Planning Area no acreage has been found to be suitable for disposal. BLM would retain management of all public lands, and projects would be subject to design review to ensure compliance and consistency with the VRM class objectives allocated in A*lternative D*. BLM would not approve inconsistent land use authorizations or rights-of-way.

***Alternative E* (Preferred Alternative)**

Impacts to visual resources from land and realty management actions would be similar to those discussed for *Alternative B* except as described below.

Impacts from utility corridors would be similar to A*lternative B* for the monument and to a combination of *Alternative B* and *C* for lands west of Interstate 17. Expanding the Black Canyon Utility Corridor one mile west from Bumble Bee south and two miles west from Bumble Bee north will allow future utility development to meet demand in the Phoenix area, while allowing the flexibility to adjust facility sighting to minimize visual impacts as viewed from scenic overlooks along Interstate 17.

4.15.3 From Management of Soil, Air, and Water Resources

Alternatives A (*No Action*), B, C, D,* and *E (*Preferred Alternative*)

Under current management preventing or reducing impacts on air quality by developing mitigation measures (e.g. dust control and the use of best management practices) during project planning could benefit visual resources by maintaining the local clarity of the visual landscape. Managing soil and water resources is not expected to affect visual resources.

4.15.4 From Biological Resource Management

***Alternative A* (No Action)**

Under current management, wildlife habitat improvements are designed to minimize visual impacts, but outside of Wilderness areas, projects are designed to comply with VRM Class III standards. Though few projects are constructed, compliance with VRM Class III could result in steady degradation of visual landscapes. The contribution to that from biological resources management would be negligible.

Alternative B

Impacts on visual resources from the general management of biological resources would be similar to those described for *Alternative A*, except wildlife related projects would be designed to comply with VRM Class I or II standards in many places, which would minimize visual impacts from those projects. Closing routes and prohibiting new fences in the Harquahala Mountains WHAs (64,220 acres) could benefit visual resources by reducing existing visual disruption and minimizing future disturbances to the visual landscape.

Alternative C

Impacts on visual resources from biological resources would be similar to those described for *Alternative B* except that in Agua Fria National

Monument 39,330 acres of WHAs for pronghorn antelope would be allocated. Potential closure or mitigation of routes in the WHAs could enhance the visual landscape by removing existing disturbances.

In the Bradshaw-Harquahala Planning Area impacts would be similar to those under *Alternative B* except that the total area of WHAs would increase to 157,180 acres.

Alternative D

Impacts to VRM from Biological resource management in the monument are the same as described for *Alternative C*.

Impacts on visual resources from biological resources would be similar to those described for *Alternative C* except that the Date Creek Mountains and Upper Agua Fria River Basin WHAs, encompassing 24,290 acres, would also be included. Other management for biological resources is prescribed in ACECs.

***Alternative E* (Preferred Alternative)**

Impacts to visual resources from biological resources would be similar to those described for *Alternative C*.

4.15.5 From Cultural Resource Management

***Alternative A* (No Action)**

No impacts are expected.

Alternative B

Implementing physical and administrative protection measures to stop, limit, or repair damage and vandalism to sites could affect visual resources. Building fences or other barriers could impair visual resources. Closing routes and restricting grazing could increase vegetation cover, creating a more natural-appearing landscape.

Additionally, the following potential management actions could affect visual resources by altering the visual landscape:

- building new visitor facilities (including gravel parking areas, restrooms, picnic tables, trash receptacle, or benches), and
- route improvements with the addition of signs.

Authorizing commercial and other group tours could degrade visual resources because of disturbances caused by overuse.

In Agua Fria National Monument levels of public use determine the level of intensities and interpretive development permitted for archaeological sites. High public use could disturb visual resources by the following:

- adding visitor facilities,
- improving routes including sign additions, and
- developing a motorized and non-motorized loop trail system.

In Agua Fria National Monument 4,438 acres would be allocated to High public use for cultural resources, and five sites could have impacts described under Cultural Resources section of Management Common to Both Planning Areas: Pueblo la Plata complex, Badger Springs Pueblo, the Arrastre site, Badger Springs rock art, and the Rollie site.

In the Bradshaw-Harquahala Planning Area the allocation of eight SCRMAs, totaling 316,103 acres, could affect visual resources. Impacts could result from building visitor facilities (parking areas, restrooms, tables, benches, signs) in addition to completing actions to stabilize, repair, and maintain sites in good condition (including fencing and barriers). Impacts on visual resources could also result from concentrating visitors in a specific area. Such concentrations could cause more ground disturbance (e.g. new trails and vehicular routes) and lead to increased litter.

Alternative C

Impacts to visual resources from cultural resources would be similar to those under the Visual Resources section of Management Common to Both Planning Areas.

In Agua Fria National Monument 11,600 acres would be allocated to High public use, and two sites could experience impacts similar to those described under the Cultural Resources section of Management Common to Both Planning Areas: Fort Silver and the Pueblo la Plata complex.

In the Bradshaw-Harquahala Planning Area the allocation of four SCRMAs could result in actions affecting visual resources. Impacts would be the same as those described for SCRMAs under *Alternative B*.

Alternative D

Impacts to visual resources from cultural resources would be similar to those discussed in the Visual Resources section of Management Common to Both Planning Areas. In Agua Fria National Monument no sites would be allocated to High public use. Without development to support visitation and site interpretation, management of cultural resources would have no impact on Visual Resources.

In the Bradshaw-Harquahala Planning Area the allocation of two SCRMAs could result in actions affecting visual resources. Impacts would be the same as those described for *Alternative B*.

***Alternative E* (Preferred Alternative)**

Impacts in Agua Fria National Monument would be would be similar to those in *Alternative C*.

Impacts in the Bradshaw-Harquahala Planning Area would be similar to those in *Alternative B*.

4.15.6 From Paleontological Resource Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

There are no impacts expected.

4.15.7 From Recreation Management

***Alternative A* (No Action)**

Under current management of Agua Fria National Monument visual resources could be impacted by installing signs at national monument boundaries and posting other relevant information, in addition to disturbances and potential damage caused by target shooting.

Under current management of the Bradshaw-Harquahala Planning Area installing more signs could degrade visual resources. Such signage could lead to localized reductions in visual quality, especially in remote and undeveloped areas.

Large public land areas west of Highway 93 remaining open to cross-country and unstructured OHV activity would continue to affect visual resources. Allowing a proliferation of new routes disturbs the soil and results in a loss of vegetation. As visitation increases over the life of the plan, visual qualities could be further degraded by landscape damage and increasing levels of dust.

Alternative B

In Agua Fria National Monument recreational activities would be divided into three resource management zones: Front Country (57,900 acres), Back Country (12,700 acres), and Passage (300 acres). In the Front Country RMZ maintaining or enhancing both non-motorized and motorized visitor travel could affect visual resources by the following actions:

- introducing human facilities into the viewshed,
- developing cultural sites, and

- building visitor amenities such as developed campgrounds.

In the Back Country RMZ current conditions would be maintained, and no impacts are expected.

The Passage RMZ would contain the major vehicle routes or traverse across the Back Country RMZ. VRM objectives would allow maintaining the current visual character while providing limited management activities. Some visitor related development could occur, but it would not create impact the surrounding landscapes that would attract attention from observers.

In the Bradshaw-Harquahala Planning Area all lands in MUs would be allocated as Extensive Recreation Management Areas (ERMAs) unless superseded by management actions for SRMAs or RMZs. Visual resources could be affected by management prescriptions for ERMAs. The following actions could impact visual opportunities by altering visual landscape:

- installing recreation management facilities for resource protection, and
- adding visitor facilities such as water, toilets, scenic turnouts, interpretive sites, kiosks, signage, parking areas, staging areas, and trailheads.

Besides the physical changes from the developments themselves, the improvements could promote activities and increase disturbance in concentrated areas. The developments could thus increase visual impacts in those areas while leaving other areas less disturbed and reducing visual impacts.

In the Bradshaw-Harquahala Planning Area, management prescriptions for nine SRMAs (149,760 acres of BLM lands) could affect visual resources. SRMAs managed to develop designated staging/camping areas and visitor facilities (parking areas, horse facilities, and signs), could affect visual opportunities by altering the visual landscape. Commercial and motorized competitive events could alter the visual landscape by doing the following:

- increasing litter,
- disturbing the natural landscape, and
- reducing local visual clarity with concentrated dust and vehicle emissions.

Impacts to visual resources from managing two locations where lands are allocated to maintain or enhance wilderness characteristics (96,150 acres of BLM lands) would be minimized by emphasizing semi-primitive non-motorized with semi-primitive motorized recreational settings along boundaries and along retained routes within that allocation. Closing more routes and reclaiming routes, washes, and single-track vehicle routes would enhance scenic quality and preserve the visual landscape. Motorized commercial and competitive events in the lands allocated to maintain or enhance wilderness characteristcs within the Harquahala Mountains could alter the visual landscape by reducing local visual clarity. Impacts, however, would be minimized by the restrictive timeframe for holding events.

Alternative C

Impacts to visual resources from recreation management would be similar to those discussed for *Alternative B*, except in Agua Fria National Monument, Front Country RMZ would decrease to 42,410 acres, Back Country RMZ would increase to 28,420 acres and Passage RMZ would decrease to 70 acres.

In the Bradshaw-Harquahala Planning Area, impacts would be similar to *Alternative B*, except *Alternative C* would increase the allocation of nine SRMAs to 164,780 acres, and increase areas allocated to maintain or enhance wilderness characteristics to four, totaling 98,430 acres.

Alternative D

Impacts to visual resources from recreation management would be similar to those under *Alternative B*, except in Agua Fria National

Monument where Front Country RMZ would be further decreased to 1,530 acres, Back Country RMZ would be increased to 68,380 acres, and Passage to 990 acres.

Impacts to visual resources in the Bradshaw-Harquahala Planning Area would be similar to *Alternative B*, except BLM would decrease the allocation of SRMAs to seven, totaling 56,240 acres. Areas allocated to maintain or enhance wilderness characteristcs would increase to six, but decrease in total acreage to 91,480.

***Alternative E* (Preferred Alternative)**

Impacts to visual resources in Agua Fria National Monument would be similar to *Alternative B*, except Front Country RMZ would increase to 12,440 acres, Back Country RMZ would decrease to 57,200 acres, and Passage would increase to 1300 acres.

Impacts in the Bradshaw-Harquahala Planning Area would be similar to *Alternative B*, except BLM would allocate seven SRMAs, increasing the acreage to 384,510, and six areas allocated to maintain or enhance wilderness characteristcs, increasing the acreage to 109,910.

4.15.8 From Visual Resource Management

***Alternative A* (No Action)**

Alternative A would maintain current conditions, and since no VRM management classes were established through prior planning, the visual landscape is expected to gradually decline. The policy to treat the whole area as VRM Class III could allow visual intrusions that are inconsistent with public interests. In addition, a lack of clear management direction for current planning has lead to visual resource management being inconsistently applied in the analysis of proposed projects, accelerating the potential degrading of the aesthetic landscape.

Alternative B

VRM allocations for both areas can be viewed on Map 2-15.

Impacts on visual resources from visual resource management would occur as VRM class standards are implemented and future projects are subject to conformance with design standards to meet class objectives.

In Agua Fria National Monument all Front Country RMZs (57,900 acres) would be managed as VRM Class III. All Back Country and Passage RMZs (13,000 acres) would be managed as VRM Class II.

In the Bradshaw-Harquahala Planning Area VRM Classes would be allocated as described below:

- The area of Class I lands would be 96,820 acres.
- The area of Class II lands would increase to 486,800 acres.
- The area of Class III lands would increase to 284,720 acres.
- The area of Class IV lands would decrease to 98,660 acres.

Establishing VRM management classes described above would allow management consistent with resource objectives described for *Alternative B* while protecting the aesthetic landscape. Proposed projects over the life of the plan are expected to create some visual intrusions in places where they now don't exist. Any change to the visual landscape is expected to be minimized by the following:

- developing VRM management classes,
- applying a consistent approach to analyzing new projects, and
- using visually sensitive design techniques.

Alternative C

VRM allocations for both areas can be viewed on Map 2-36.

In Agua Fria National Monument visual resource impacts would be the same as those discussed for *Alternative B*, except that 42,410 acres of Front Country RMZ would be managed as VRM Class III and 28,490 acres of Back Country and Passage RMZs would be managed as VRM Class II.

In the Bradshaw-Harquahala Planning VRM Classes would be allocated as described below:

- The area of Class I would be 109,570 acres.
- The area of Class II would be 502,610 acres.
- The area of Class III would be 260,020 acres.
- The area of Class IV would be 94,800 acres.

Impacts under *Alternative C* would be similar to those described for *Alternative B*, except that more land would be included in VRM Class II. This increase in Class II land is expected to preserve the existing open, natural landscapes in a larger area for the life of the plan.

Alternative D

VRM allocations for both areas can be viewed on Map 2-59.

In Agua Fria National Monument visual resource impacts would be the same as those described for *Alternative B*, except that 1,530 acres of Front Country RMZ would be managed as VRM Class II and 69,370 acres of Back Country and Passage RMZ would be managed as VRM Class II.

In the Bradshaw-Harquahala Planning Area VRM Classes would be allocated as described below:

- The area of Class I would be 298,310 acres.
- The area of Class II would be 340,880 acres.
- The area of Class III would be 220,790 acres.
- The area of Class IV would be 107,020 acres.

The impacts of *Alternative D* would be similar to those described for *Alternative C*, except that the increase of land in VRM Class I would place a higher standard for managing potential visual intrusions across a larger landscape. Under *Alternative D* preserving broad natural-appearing landscapes is a high priority. The extent of the landscape preserved under *Alternative D* would be greater than under *Alternative C*, and the potential for a gradual decline of the aesthetic landscape would greatly decrease.

***Alternative E* (Preferred Alternative)**

VRM allocations for both areas can be viewed on Map 2-75.

In Agua Fria National Monument visual resource impacts would be similar to those described under *Alternative D*, except that 12,440 acres of Front Country RMZ would be managed as VRM Class III, 37,560 acres of Back Country and Passage RMZ would be managed as VRM Class II, and 20,900 acres would be allocated to maintain or enhance wilderness characteristics and would be managed as VRM Class I. The VRM Class I area would include the scenic vistas and cultural landscapes of Perry Mesa and Joes Hill, as well as views in and along the dramatic Agua Fria River Canyon. VRM Class I will help to preserve the scenic quality of these areas as described in the Appendix A.

In the Bradshaw-Harquahala Planning Area VRM Classes would be allocated as described below:

- The area of Class I would be 98,820 acres.
- The area of Class II would be 488,250 acres.
- The area of Class III would be 278,540 acres.
- The area of Class IV would be 103,390 acres.

The impacts of *Alternative E* would be similar to those described for *Alternative D*.

4.15.9 From Rangeland Management

***Alternative A* (No Action)**

Installing more fences or livestock improvements (cattle guards, water developments, and roads needed to access improvement sites) on BLM-administered lands or adjacent State and private lands could contribute to the steady decline of visual quality throughout the planning area.

Alternative B

Impacts to visual resources from rangeland management would be similar to those discussed for *Alternative A*, except:

Additional fencing requirements to meet seasonal riparian area restrictions and fencing modifications to facilitate wildlife movement could increase the total number of proposed livestock control projects. Conformance with VRM Classes established in this plan would result in project designs that are less visually intrusive, reducing the visual impact of new projects. Restricting access to riparian areas could improve the visual setting in those areas by increasing vegetation health and density.

Alternative C

Impacts to visual resources from rangeland management would be similar to those described under *Alternative B*. Prohibiting grazing in riparian areas could further enhance the visual setting by accelerating increases in the health and density of vegetation.

Alternative D

Closing all livestock grazing allotments and canceling livestock authorizations in the planning areas could affect visual resources. Unnecessary livestock facilities could be removed as funds and workforce allow, reducing the visual intrusions of fences, corrals, water tanks, and other livestock related facilities. Prohibiting grazing could also modify the visual landscape through increased vegetation health and density in higher desert and grassland communities as utilization of forage decreases.

Conversely, the elimination of grazing on BLM-administered lands could affect the visual landscape through fencing developed on adjacent non-Federal lands to control livestock from trespassing onto BLM lands and through other grazing improvements to meet livestock needs that may have been lost from BLM lands. In addition, since the closure of BLM lands to grazing may force ranchers out of business, they may be forced to convert their adjacent properties to residential or other development, further degrading the visual landscapes in the region.

***Alternative E* (Preferred Alternative)**

Impacts to visual resources from rangeland management would be the same as those discussed under *Alternative B*.

4.15.10 From Minerals Management

***Alternative A* (No Action)**

Under current management in Agua Fria National Monument only lands encumbered by mining claims are open to mining. No activity beyond casual use as defined in 43 CFR 3809 would be allowed without determinations of valid existing rights. Therefore, mineral development on existing claims would have minimal impacts on visual resources because of the typical scale of these operations.

In the Bradshaw-Harquahala Planning Area BLM administers mining on a case-by-case basis, but most of the planning area would remain open to mineral location and development. Mining would alter the existing visual landscape by adding mining scars,

facilities for operations, and routes. Localized degradation of air quality and visual clarity could result from mine emissions and increased dust emissions.

The five designated Wilderness areas (96,820 acres) would continue to be closed to any mineral development. In *Alternative A*, visual impacts from the different types of mining would be eliminated on the following lands (including Wilderness acres):

- 172,510 acres would be closed to development of saleable minerals
- 171,680 acres would be closed to development of locatable minerals
- 171,680 acres would be closed to development of leasable minerals

Alternative B

In Agua Fria National Monument impacts to visual resources from minerals management would be the same as those discussed for *Alternative A*. In the Bradshaw-Harquahala Planning Area minerals management could affect visual resources over most of the planning area. BLM would attempt to make the mining or eventual reclamation requirements consistent with the affected VRM class. Overall, *Alternative B* would allow more visual intrusion into the landscape than would *Alternatives C, D,* or *E*. *Alternative B* would protect the visual landscape more than would *Alternative A*.

In the Bradshaw foothills, the area surrounding Wickenburg, and south of White Tank Mountain Regional Park, a conflict could result from areas being managed at a VRM Class II level but being largely open to mineral development. Visual resources could be affected by developing new mines and by such improvements as roads.

In *Alternative B*, visual impacts from the different types of mining would be eliminated on the following lands (including Wilderness acres):

- 268,260 acres would be closed to development of saleable minerals
- 171,680 acres would be closed to development of locatable minerals
- 171,680 acres would be closed to development of leasable minerals

Alternative C

Impacts on visual resource management from minerals management would be similar to those under *Alternative B*, except visual impacts from the different types of mining would be eliminated on the following lands (including Wilderness acres):

- 325,970 acres would be closed to development of saleable minerals
- 188,450 acres would be closed to development of locatable minerals
- 188,190 acres would be closed to development of leasable minerals

Alternative D

Impacts to visual resource management from minerals management would be similar to those under *Alternative B*, except visual impacts from the different types of mining would be eliminated on the following lands (including Wilderness acres):

- 469,680 acres would be closed to development of saleable minerals
- 446,440 acres would be closed to development of locatable minerals
- 453,550 acres would be closed to development of leasable minerals

***Alternative E* (Preferred Alternative)**

Impacts to VRM from minerals management would be similar to those under *Alternative B*, except visual impacts from the different types of mining would be eliminated on the following lands (including Wilderness acres):

- 172,780 acres would be closed to development of saleable minerals

- 171,940 acres would be closed to development of locatable minerals
- 171,680 acres would be closed to development of leasable minerals

4.15.11 From Fire Management

***Alternative A* (No Action)**

Prescribed burning would remove existing vegetation and leave blackened woody material that would degrade the visual landscape in the short term. In addition, any mechanical treatment to establish fuel breaks or pretreat fuels would also create short term disturbances that could degrade visual quality. Plant communities in areas where prescribed fire is used are fire-adapted. Periodic fires enhance habitat health and can slow or prevent the invasion of undesired vegetation. Any scars from mechanical treatments are reclaimed as well as possible to minimize their visual impact. Long-term improvement of visual resources would result from healthier vegetation communities.

Wildfires have similar affects to the visual landscape as prescribed fires, except the area affected is less predictable. In some years fires occur in non fire adapted plant communities. In those places, the visual disturbance from fires lasts longer, potentially affecting the character of plant communities for decades.

***Alternatives B, C, D,* and *E* (Preferred Alternative)**

Impacts to visual resources from fire management would be similar to those described for *Alternative A* except that in the monument some natural start fires may be allowed to burn where they are currently suppressed. In this case, the size and frequency of fire related impacts may increase for awhile. It would be the goal to reestablish natural fire cycles as much as possible, resulting in long term fire frequency approximately the same as current prescribed burn frequency.

4.15.12 From Wild Horse and Burro Management

Alternatives A* (No Action) and *B

No impacts are expected.

***Alternatives C, D* and *E* (Preferred Alternative)**

Removing all burros from the Harquahala HA could affect visual resources by increasing vegetation cover, thereby altering the visual landscape of their range as competition for forage decreases and the burros are removed. Scenery would change as evidence of trailing and vegetation damage and trampling diminish and more natural conditions are restored.

4.15.13 From Management of Transportation and Public Access

***Alternative A* (No Action)**

Lands in the Bradshaw-Harquahala Planning Area would remain undesignated per VRM Classes. Accordingly, visual impacts from authorizations and uses would be less carefully managed. New roads and routes authorized or pioneered in the Bradshaw-Harquahala Planning Area could eventually create varying levels of visual disturbances in the planning area. Roads up hillsides, through riparian zones, and long-term soil and vegetation damage would impact visual resources over both the short and long-term. Impacts would be most significant on lands proposed for consideration as major highway corridors, especially in the Vulture Mine area, Hassayampa Plains, and the Hieroglyphic Mountains. There would be no significant impacts within the Agua Fria National Monument since the lands are under special protection provided by the proclamation (Appendix A).

Alternative B

A wide range of impacts from none to adverse are anticipated from management of travel, transportation and public access. Small transportation projects would be mitigated and consistent to the appropriate VRM classes. Impacts would be most significant on lands proposed for consideration as major highway corridors, especially in the Vulture Mine area, Hassayampa Plains, and the Hieroglyphic Mountains. There would be no significant impacts within the Agua Fria National Monument. Visual impacts to the public lands, overall, would be less than presented under *Alternative A*.

There would be visual impacts from proposed developments, but overall the alternative would mostly maintain or enhance the appearance of the public land landscapes and its open space values. Visual resources would degrade over time in some areas from reasonably projected levels of road, highway and utility development. The most significant visual impacts projected would accrue from county, State and Federal highway projects, including the Wickenburg Bypass, the NAFTA Highway, Highway 74, and other realignments of county and State roads.

Alternative C

The impacts are similar to those in *Alternative B*.

Alternative D

Far less adverse impacts are anticipated from management of transportation and public access under *Alternative D* due to the lands allocated as Class I and Class II areas. All visual impacts would be mitigated and consistent to the appropriate VRM classes. VRM allocations will maintain the natural appearance of the monument landscapes while meeting other resource management objectives. In the Bradshaw-Harquahala Planning Area impacts would be greatly reduced than those considered under *Alternatives B* and *C*. There would be little to no visual impacts from small scale transportation and travel developments. As described in *Alternative B*, there could be significant visual impacts from major county, State and Federal highway projects. Overall, Allocated VRM classes would maintain or enhance the appearance of the public land landscapes and open space value, while meeting other resource management objectives.

***Alternative E* (Preferred Alternative)**

In the Bradshaw-Harquahala Planning Area, impacts would be similar to those under *Alternative B* and projects would be installed mostly consistent with VRM objectives.

4.15.14 From Management of Wilderness Characteristics

***Alternative A* (No Action)**

No areas are under consideration for management of wilderness characteristics. Therefore, there are no impacts on visual resources.

***Alternatives B, C, D* and *E* (Preferred Alternative)**

Visual and scenic resource conditions would be maintained, enhanced, and additionally protected within landscapes allocated to maintain or enhance wilderness characteristics. Light pollution could be less, and dark skies would be effectively maintained.

4.16 Impacts on Rangeland Management

4.16.1 From Special Area Designations

***Alternative A* (No Action)**

Grazing is prohibited in Larry Canyon ACEC, which is located entirely in a steep canyon that is inaccessible to cattle. Livestock exclusion on the small acreage of the ACEC has a negligible effect on the total amount of Animal Unit Months (AUMs) of forage available for livestock grazing in Agua Fria National Monument.

If the eligible WSR segments of the Agua Fria River are designated, management actions would include seasonally restricting livestock grazing to winter use only (November 1 to March 1). On riparian segments, where grazing would be seasonally restricted, riparian vegetation and vegetation cover would increase from present levels, but a decreased amount of forage would be available to livestock. This decrease could adversely affect upland livestock distribution and increase the utilization of forage surrounding livestock waters. Range improvements, such as pumping stations to fill storage tanks, would continue and would be crucial to provide water to upland areas while livestock are excluded from the riparian areas. Without these water sources, forage utilization by livestock could increase around improvements such as dirt tanks or springs.

There is a minor risk of livestock-vehicle collisions increasing along the Harquahala Mountain Summit Scenic Road.

Alternative B

In Agua Fria National Monument designating Bloody Basin Road as a back country byway would likely increase traffic and recreation uses of the area. Potential for animal-vehicle collisions would increase with increased use.

In the Bradshaw-Harquahala Planning Area, the 640-acre Tule Creek ACEC would exclude livestock grazing from fenced areas. This exclusion would increase riparian vegetation and vegetation cover. The small size of the enclosure would negligibly decrease AUMs for the grazing allotment, and permitted numbers of livestock would be unaffected.

Impacts of designating Constellation Mine Road as a back country byway would be similar to the impacts described for the Harquahala Summit Scenic Road in *Alternative A*.

Alternative C

In Agua Fria National Monument, designating four new ACECs would prohibit grazing on 810 acres of riparian habitat. This area represents one percent of the 72,305 acres allotted to grazing in the monument. Though the AUMs lost have not been calculated, riparian areas generally produce more forage per acre than uplands; therefore, forage lost to grazing would likely exceed one percent of total available AUMs. Riparian areas are also critical livestock water sources. Riparian vegetation and vegetation cover would increase with the exclusion of livestock grazing in these areas.

In the Bradshaw-Harquahala Planning Area seven ACECs are proposed for designation. These designations would protect 87,310 acres from surface disturbance due to mining or materials extraction, which would reduce damage to range vegetation and lessen mining traffic on the access roads. The possibility of livestock injury and mortality from vehicle collisions would be lowered.

Impacts on designating the Constellation Mine Road as a back country byway would be the same as *Alternative B.*

Alternative D

In Agua Fria National Monument, designation of the 13,070-acre Agua Fria River Riparian Corridor ACEC would reduce traffic volume, damage to range vegetation, and penetration of recreational users into more remote areas. These actions would reduce stress to wildlife and potential vectoring of noxious weeds.

In the Bradshaw-Harquahala Planning Area, eight ACECs comprising 314,580 acres are proposed for designation. Vehicle restrictions would reduce damage to range vegetation, stress to wildlife, and vectoring of noxious weeds.

Restrictions on mining and mineral material extraction would result in less damage to of range vegetation and reduced volumes of mining traffic.

***Alternative E* (Preferred Alternative)**

In the national monument, there are no ACEC proposals under this Alternative. The ACEC acreage in the Bradshaw-Harquahala would then be 89,970 acres.

In the Bradshaw-Harquahala, impacts from ACECs would be similar to *Alternative C,* except there are more acres proposed in ACECs.

4.16.2 From Lands and Realty Management

***Alternative A* (No Action)**

Any future land acquisition in Agua Fria National Monument could increase the forage available for livestock grazing. Private land amounting to 1,444 acres makes up less than two percent of the land in the monument. Any increase in AUMs would be negligible, and grazing authorizations would not be increased to reflect the change in ownership. Therefore, no impacts are expected from management of lands and realty.

New utility construction and maintenance of existing utilities within the monument might have short-term vegetation impacts, although maintenance and construction projects have not typically impacted the amount of forage for livestock use.

Acquiring privately owned and State-held lands would create large blocks of federally managed lands in the following areas:

- Black Canyon and Lake Pleasant RCAs,
- Cordes Junction, Bumble Bee, and Williams Mesa MRMAs, and
- the 4-mile reach of State land along the Hassayampa River.

These blocks would consolidate management and help develop healthy native plant communities in upland and riparian communities. These additions to the BLM's land base might increase the total AUMs that can be offered through grazing authorizations. The acreage of the area that might be added is unknown since acquisition is generally on a willing seller or willing buyer basis and it is impossible to predict future opportunities.

Lands available for disposal (54,370 acres) through sale, conveyance, or R&PP actions might have infrastructure construction of various types. These activities typically have a slight effect on the total AUMs for livestock grazing. Any land tenure adjustment could decrease the amount of forage or range improvements for livestock. Depending on the size of the area disposed of, or number of range improvements involved, authorized AUMs might need to be adjusted or whole allotments may be closed.

Alternative B

In Agua Fria National Monument narrowing the utility corridor to existing rights-of-way would restrict impacts to vegetation from new utility construction. Other lands and realty related impacts would be the same as under *Alternative A.*

Construction and maintenance of facilities in planned transportation and utility corridors and communication sites would have similar impacts to those described for Alternative A.

Impacts of land acquisitions would be the same as under *Alternative A.*

The proposed disposal through sale, conveyance, or R&PP actions of as much as 58,400 acres would reduce the acreage contributing to AUMs for allocation under BLM's grazing permits. Depending on the size of the action in a grazing allotment, authorized AUMs might need to be adjusted. The total acreage from these actions would represent a potential loss of less than six percent of the lands available for livestock

grazing in the Bradshaw-Harquahala Planning Area.

Alternative C

Eliminating the Black Canyon utility corridor would remove the following potential impacts from new utility development:

- short-term vegetation disturbance,
- stress to livestock and wildlife,
- animal-vehicle collisions, and
- vectoring of invasive weeds.

In the Bradshaw-Harquahala Planning Area, the impacts on grazing use from acquiring non-Federal lands would be similar to those described under *Alternative A*. Impacts of the land tenure adjustment of 49,100 acres of BLM-managed Federal lands would be similar to those described under *Alternative B*, except that the total acreage from these actions would represent a potential loss of five percent of the lands available for livestock grazing in the Bradshaw-Harquahala Planning Area.

Alternative D

In Agua Fria National Monument eliminating the Black Canyon utility corridor would have impacts similar to those described for *Alternative C*, except that impacts to grazing and livestock would end with cessation of grazing.

In the Bradshaw-Harquahala Planning Area, impacts to grazing and livestock would end with the cessation of grazing.

***Alternative E* (Preferred Alternative)**

In Agua Fria National Monument, narrowing of the utility corridor would have impacts similar to *Alternative B.*

Future land acquisition in Agua Fria National Monument would have impacts similar to *Alternative A.*

Impacts of proposed land tenure adjustment through sale, conveyance, or R&PP actions of as much as 38,755 acres of land outside the MUs, would be similar to *Alternative A*. The total acreage from these actions would represent a potential loss of four percent of the lands available for livestock grazing in the Bradshaw-Harquahala Planning Area.

New utility construction and maintenance of existing utilities would have similar impacts to *Alternative A.*

4.16.3 From Management of Soil, Air, and Water Resources

Alternatives A (*No Action*), B, C, D,* and *E (*Preferred Alternative*)

Implementing activity plans to address soil and water issues might require mitigation that would affect livestock grazing authorizations. If reducing or eliminating livestock grazing is a management action used to reach desired conditions, the rate of improvement to vegetation would be accelerated. These actions could result in reduced authorized livestock numbers for grazing permits. Promoting increased vegetation cover and reduced soil erosion should decrease localized emissions of naturally occurring windblown fugitive dust.

4.16.4 From Biological Resource Management

***Alternative A* (No Action)**

In Agua Fria National Monument the use of fire as a treatment to improve vegetation composition would have short-term impacts to vegetation from burning. Fire use would affect grazing authorizations by requiring a pasture to be rested before and after treatment. Grazing use could increase on other nontreated pastures, or authorized grazing use could be reduced. The fire treatment could result in improved vegetation quality, quantity, and increased vegetation cover. Limits on mechanical

vegetation treatment methods could increase the potential for invasive species to encroach. Water sources accessible to livestock and wildlife would improve animal distribution and localized vegetation impacts from grazing. Modifying fencing to allow for wildlife movement could improve across pastures and allotments. These livestock movements would increase the time and work for grazing permittees/lessees to control livestock. To prevent disruption to native fish transplants, livestock would be restricted or excluded in these areas.

In the Bradshaw-Harquahala Planning Area mitigation for spring and seep development could require livestock exclusion. Closing of waters could lead to increased livestock use in other areas and result in potentially poor livestock distribution across the landscape. Watering points outside the protected zone would need to be developed to maintain proper livestock distribution. Added costs would be incurred to make the infrastructure improvements.

***Alternatives B, C, D,* and *E* (Preferred Alternative)**

In the national monument, impacts would be similar to those described under *Alternative A.*

In the Bradshaw-Harquahala Planning Area, prohibiting the building of rangeland improvements in Browns Canyon and the Inner Basin would limit the potential to improve current livestock distribution on the Aguila allotment. Upland vegetation could improve with the lack of livestock grazing in the area. Closing, limiting, or mitigating motorized vehicle routes in the 64,220-acre Harquahala Mountain WHA could reduce access to range improvements, which would increase costs for maintenance. Reduced vehicle access could limit the risk of animal collisions, and vegetation damage.

Prohibiting domestic sheep and goat grazing within 9 miles of occupied desert bighorn sheep habitat would affect the Garcia Grazing Allotment (3905), where sheep are currently authorized as a class of livestock. In order to implement the above decision, the class of livestock on the grazing permit would be changed to reflect cattle only, for the affected portion of the allotment. The Garcia allotment consists of two discrete parcels. The southern portion of the Garcia allotment, approximately 25,600 acres, would continue to be authorized to stock cattle year-long. The northern parcel could stock cattle year-long and/or sheep by ephemeral permit. Implementing the change in class of livestock may adversely affect the livestock operation on the Garcia allotment as sheep have been stock ephemerally in recent years. The economic affect of the change would depend on market prices, operating costs, and availability of alternate replacement pastures.

4.16.5 From Cultural Resource Management

***Alternative A* (No Action)**

Implementing protective measures and excluding livestock grazing would reduce AUMs of forage, which is directly proportional to the protected surface area. If the protected area contains existing livestock water sources, locations, or facilities, they would need to be developed outside of these areas to maintain a proper distribution of livestock. Impacts are expected to be negligible.

***Alternatives B, C, D,* and *E* (Preferred Alternative)**

For both planning areas, High public use development would damage vegetation in the immediate area of the site construction. Depending on the level of public use, surrounding vegetation could also be damaged by increased vehicular use and visitor trampling. In addition, High public use development might require excluding livestock from large areas in the vicinity of developed sites. Though some AUMs might be removed from the available forage, the size of the areas would be negligible, and livestock

numbers should not need to be adjusted. If the protected areas contain existing livestock water sources, more watering locations or facilities would need to be developed outside of these areas.

Moderate public use impacts to vegetation would be minimal, and Low public use impacts would even be smaller. Impacts to grazing use would be similar to those under *Alternative A.*

4.16.6 From Paleontological Resource Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

There are no impacts expected.

4.16.7 From Recreation Management

***Alternative A* (No Action)**

Confining vehicles to designated routes in the Multiple Use Resource Areas would reduce the potential for vegetation damage by unauthorized cross-country OHV travel. Within the boundaries of the Phoenix RMP, limiting vehicles to existing roads and trails has lead to a proliferation of vehicle routes being created by users. Use on these routes increases as recreational users increase, disturbing more vegetation, increasing vandalism of private property and range improvements, and increasing vehicle-animal encounters. Within the boundaries of the Lower Gila North Management Framework Plan, open use for vehicles will lead to faster proliferation of routes as OHV users are pushed further into the few remaining remote areas. As routes proliferate and use increases, vegetation disturbance and animal-vehicle encounters will increase, as will vandalism of range improvements.

Activities authorized through Special Recreation Permits (SRPs) are expected to have impacts similar to those from use by the general public. Growth in the number of special use permits issued for motorized events and races could increase the risk of potential mortality from collisions with vehicles. The permit process allows BLM to control where the permittees will go and places stipulations on how they will conduct their events or businesses. These factors help to reduce the potential affects on disturbance of livestock and range resources.

Alternative B

In Agua Fria National Monument, 57,900 acres would be allocated as Front Country RMZ, and 12,700 acres would be allocated as the Back Country RMZ. Increased visitation within the Front Country could bring increased vehicle numbers, which will increase the potential for animal-vehicle collisions.

Increased visitation would bring increased vehicle numbers. The potential for animal-vehicle collisions would increase with rising recreation use. Increased OHV use could increase the vectoring of invasive weeds, which could displace native vegetation.

Limiting vehicle use to designated routes will allow route location and network design to address impacts to range resources. This could help reduce the affects of increasing recreation use on vegetation, livestock, and range improvements, reducing the potential for upland vegetation damage by cross-country OHV travel. The OHV travel restriction would decrease the potential for animal-vehicle collisions. Other recreation impacts in the Bradshaw-Harquahala Planning Area would include:

- Recreational target shooting would be prohibited on 27,570 acres and restricted near High public use areas, resulting in a decreased risk of animal stress and mortality.
- Depending on the size of the campground/staging areas to be developed in support of motorized use, authorized livestock grazing might need to be adjusted.

- New trails established for pedestrian, non-motorized, and motorized use could increase the risk of animal stress and potential mortality from collisions with vehicles.

Alternative C

Impacts in Agua Fria National Monument would be similar to those described for *Alternative B.* The area of Front Country would decrease and Back Country would increase, reducing the potential for encounters between people and livestock. Reductions in route miles may make some areas difficult to access, increasing operating costs of grazing permittees.

In the Bradshaw-Harquahala Planning Area recreation impacts would be similar to those described for the monument and described for *Alternative B* with these additions:

- Restricting target shooting near high-use areas would decrease the risk of animal stress and mortality.
- Reduced special use permits issued motorized race events could reduce the risk of disturbance to livestock and mortality from collisions with vehicles.

Activities authorized through Special Recreation Permits (SRPs) are expected to have impacts similar to those in *Alternative B.*

Alternative D

Impacts to rangeland resources, including developments that remain and range land vegetation would be similar to those described under *Alternative A.*

Impacts to livestock operations would not be applicable because grazing ceases in this Alternative.

Activities authorized through Special Recreation Permits (SRPs) are expected to have impacts similar to those in *Alternative B.*

***Alternative E* (Preferred Alternative)**

Impacts in Agua Fria National Monument would be the same as *Alternative B*, except that the Front Country RMZ would decrease to 12,440 acres, the Back Country RMZ would increase to 57,200 acres, and the Passage RMZ would increase to 1,300 acres.

For both planning areas, impacts of confining vehicles to designated routes are expected to be similar to *Alternative C*.

Activities authorized through Special Recreation Permits (SRPs) are expected to have impacts similar to those in *Alternative B.*

4.16.8 From Visual Resource Management

***Alternative A* (No Action)**

Because VRM standards are not managed under *Alternative A,* no impacts are expected.

***Alternatives B, C, D,* and *E* (Preferred Alternative)**

Alternative D eliminates grazing from the planning area, so no impacts are expected from VRM management.

Under *Alternatives B, C,* and *E,* impacts to rangeland resources, particularly grazing management, resulting from VRM management classes, would include the following:

- increased cost of range project development to conform to VRM class objectives,
- location of some projects in less desirable places, or
- possible denial of some projects that cannot conform to VRM class objectives.

These impacts are expected to be small.

4.16.9 From Rangeland Management

***Alternative A* (No Action)**

There are no impacts expected for either planning area.

Alternative B

In both planning areas, allowing winter-only grazing in riparian areas would increase riparian vegetation. Areas where livestock are preventing attainment of Proper Functioning Condition (PFC) are expected to recover. With the seasonal restriction of use, upland vegetation utilization could increase, and authorized livestock use could be reduced. The need for livestock number adjustments would involve a number of factors, including the size of pastures affected, period of use, and current livestock numbers.

Implementation of Land Health Standards and Guidelines for Grazing Administration would impose an allotment evaluation process as a step to permit or lease renewal. These evaluations would determine where the Land Health standards are not being met and livestock management actions that may be needed to achieve them. It is possible stocking rates could be adjusted, pastures may be rested, or some pastures or allotments may be converted to ephemeral use only based on the Special Ephemeral Rule. (See Chapter 2, section 2.7.3.10 for a discussion of the Special Ephemeral Rule.)

Alternative C

Impacts would be similar to those described in *Alternative B*, except:

Prohibiting grazing in riparian areas in Agua Fria National Monument would close 25,989 acres to livestock grazing. This acreage would represent a loss of 36 percent of the lands available for livestock grazing in the national monument. Prohibiting grazing in riparian areas in the Bradshaw-Harquahala Planning Area would potentially close 249,400 acres to livestock grazing. This acreage would represent a loss of 26 percent of the lands available for livestock grazing in this planning area, mainly in the Black Canyon, Castle Hot Springs, and Hassayampa MUs.

For both planning areas a reduction in authorized livestock use could be proportional to the land removed from livestock grazing in allotments. Riparian areas are also critical livestock water sources, and the potential loss in availability to livestock grazing from riparian closure would be greater than for closing upland areas. The loss of water sources in some instances could preclude any grazing on upland pastures, effectively resulting in no grazing on public lands. Riparian vegetation and vegetation cover would increase with the excluding of livestock grazing in these areas more rapidly than under *Alternative B*.

Alternative D

Closing all grazing allotments and canceling all permits/leases would result in the loss of forage to livestock grazing of 13,492 AUMs from Agua Fria National Monument and 69,568 AUMs, along with any authorized ephemeral livestock use, from the Bradshaw-Harquahala Planning Area. Should alternative forage locations not be found on State, private, or other lands; grazing operators on 11 allotments on the national monument and 93 allotments in the Bradshaw-Harquahala Planning Area would be out of business. Removing unnecessary range improvements would increase BLM's administrative costs until the improvements are removed. BLM would bear the cost for long-term maintenance of the remaining improvements.

With the cessation of livestock grazing, both upland and riparian vegetation would increase in amount and quality until it reaches stability with environmental factors.

***Alternative E* (Preferred Alternative)**

Impacts would be similar to those in *Alternative B.*

4.16.10 From Minerals Management

***Alternative A* (No Action)**

Agua Fria National Monument is closed to new mineral entry. This action eliminates the potential for heavy hauling equipment for mining, and with it, the risk of increased livestock-vehicle collisions. The loss of productive rangeland vegetation to the surface disturbance of mining would also be avoided.

Impacts to rangeland resources from mining include the potential disruption of livestock movement and distribution of use from hauling material, from fencing mines, and in the case of very large mines, closure of large portions of grazing allotments. Mining has been of small consequence in the planning area in the last 10 to 20 years and is expected to continue to have negligible impacts to rangeland resources.

***Alternatives B, C, D,* and *E* (Preferred Alternative)**

Impacts in Agua Fria National Monument would be similar to those described under *Alternative A.*

In the Bradshaw-Harquahala Planning Area closure to different types of mining would vary by Alternative. Even though the area over which the mining could occur is large, the actual area of impact is expected to be relatively small. Only negligible impacts are expected.

4.16.11 From Fire Management

***Alternative A* (No Action)**

In both planning areas the use of fire as a treatment to improve vegetation composition and cover would have short-term impacts to vegetation from burning. Prescribed fire would also affect grazing authorizations by the requiring pastures to be rested before and after the treatment. Grazing use could reduce or increase on other nontreated pastures. The fire treatment could improve vegetation quality and quantity and increased vegetation cover.

Alternatives B, C, D,* and *E (*Preferred Alternative*)

In Agua Fria National Monument some naturally ignited fires would be allowed to burn if defined prescriptive conditions are being met. Regardless, impacts would be similar to those described for *Alternative A.*

4.16.12 From Wild Horse and Burro Management

***Alternative A* (No Action)**

There are no impacts expected in Agua Fria National Monument because no burros inhabit the area.

Current conditions for burros would be maintained in the 80,800-acre Lake Pleasant HMA. Burros, wildlife, and livestock would continue to compete for forage and water at an expected constant level due to environmental constraints and management control of burro numbers (e.g. herd gathers).

If all animals in the Harquahala herd are gathered and permanently removed, upland vegetation would slightly increase, and the riparian area would slightly improve in Browns Canyon. Competition with livestock and wildlife for water would also decline. Because burros use this area only seasonally, impacts from their use would vary on a yearly basis.

***Alternatives B, C, D,* and *E* (Preferred Alternative)**

Continued management actions in the Lake Pleasant HMA and the Harquahala HA over a combined area of 237,055 acres would not significantly change present use patterns or affect rangeland resources or livestock use.

4.17 Impacts on Minerals and Energy Resources

This analysis discusses the impacts of the Alternatives on developing valuable minerals on public lands. In addition to the land surface in Federal ownership, this plan addresses lands where BLM retains subsurface (mineral) rights—an area of 346,300 acres within the planning area's boundaries and 181,200 acres to the north and east of the planning areas.

BLM manages three categories of minerals:

- leasable minerals: which include oil, natural gas, coal, sodium, and geothermal resources;
- saleable minerals: also known as mineral materials, which include sand and gravel, decorative rock, and other common minerals; and
- locatable minerals: which include precious metals such as gold, silver, copper, and some industrial minerals such as gypsum and clay.

Several approaches to mineral leasing are available under 43 CFR 3100 to 3500, the regulations for issuing mineral leases. The options include opening areas to leasing, subject to the following:

- the terms and conditions of a standard lease,
- minor constraints such as seasonal restrictions, or
- major constraints such as denying surface occupancy.

For locatable minerals, governed by the regulations in 43 CFR 3802, 3715, and 3809, and for saleable minerals, according to the regulations in 43 CFR 3600, the Alternatives determine which areas are to be open to the operation of the mineral leasing laws, mining laws, and mineral material disposal. In open areas, the Alternatives define any area-wide terms, conditions, or other special considerations needed to protect resources.

LEASABLE MINERALS

Oil and Gas

Background Information and Assumptions

Although the potential for oil and gas leasing is low to medium throughout the minerals planning area, the potential for leasing is low. The potential is somewhat higher in the areas north of 35 degrees north latitude.

Oil and gas exploration was active in the Bradshaw-Harquahala Planning Area from 1913 to the 1980s. No oil and gas development has occurred on public lands, and no proven reserves have been documented. There is now no leasing interest. However, areas of moderate oil and gas potential do exist (Map 3-17).

The price of crude oil was a significant driving force for increased oil and gas exploration in the 1970s. The 1980s saw active exploration in the Basin and Range Physiographic Province of Arizona to test the Laramide Overthrust Trend. There has been no drilling since the 1980s. A trend toward increasing exploration is occurring throughout the United States as the active rig count increases with rising crude oil prices. Thus, there is potential for domestic crude demand to stimulate oil and gas exploration in the mineral planning area.

The following assumptions were considered when evaluating the Reasonable Foreseeable

Development (RFD) for oil and gas in the decision area:

- Oil and gas drilling would increase in the next 20 years in response to increasing crude oil and gas prices, domestic demand, and decreasing domestic production.
- Advances in three-dimensional seismic acquisition and processing technology would improve the resolution of subsurface structural and/or stratigraphic traps and delineate potential reservoir targets.

Reasonable Foreseeable Development

The RFD for oil and gas in the Bradshaw-Harquahala Planning Area estimates that ten exploratory wells would be drilled on BLM-administered land in the decision area.

Disturbance to the Bradshaw-Harquahala Planning Area

The extent of land disturbance from exploration drilling is estimated from the mean generalized impact values presented by the Rocky Mountain Federal Leadership Forum (RMFLF 2002). Those assumptions are as follows:

- The exploration well site would occupy 10 acres, and each development or production well site would occupy 5 acres, including roads.
- Pad reclamation would reclaim 50 percent of the exploration well drill pads for the long term.

Coal Potential

No coal deposits have been reported in the minerals planning area.

Geothermal Resources

Background Information and Assumptions

Five low-temperature geothermal resource regions are recognized in the Bradshaw-Harquahala Planning Area. These regions are shown as moderate potential areas on Map 3-17. There has been no significant development of geothermal resources. These low-temperature resources might be used for small-scale space heating and for resort spas.

The Bradshaw-Harquahala Planning Area has no geothermal energy leases and no indications for future leasing. The absence of geothermal leasing probably results from the limited uses for low-temperature resources and the great expense to explore and develop them.

The following assumptions were considered when evaluating the RFD for geothermal energy in the Bradshaw-Harquahala Planning Area:

- There would be no leasing interest in the next 20 years.
- Drilling costs to explore and develop subsurface geothermal energy would be comparable to costs for oil and gas exploration and would probably be too high for the limited revenue that a low-temperature geothermal energy would generate.

Reasonable Foreseeable Development

The RFD for geothermal energy in the decision area expects that no leasing, exploration, or development would occur in the next 20 years. Costs to develop low-temperature geothermal energy are prohibitive compared to the potential revenue generation and limited uses of those resources.

Disturbance to the Bradshaw-Harquahala Planning Area

No disturbance to public lands from geothermal development is foreseeable in the decision area during the next 20 years.

Sodium

Five areas of potential sodium exist in the planning area's subsurface. There has been no significant development of those resources and

no indications for future leasing and development. The absence of sodium leasing in the planning area (except in the Luke Basin) is probably due to the limited demand for sodium and the great expense of exploring and developing it. Morton Salt is solution mining salt for industrial purposes from the Luke salt deposit. BLM has one lease with Morton for solution mining on the Luke deposit.

Reasonable Foreseeable Development

The RFD for sodium expects that no more leasing, exploration, or development would occur in the planning area in the next 20 years. Costs to explore and extract by drilling are considerable compared to the local demand and limited uses of sodium in Arizona.

Disturbance to the Bradshaw-Harquahala Planning Area

No disturbance to public lands is foreseeable from sodium development in the decision area in the next 20 years.

LOCATABLE MINERALS

Background Information and Assumptions

Mineral districts in the Bradshaw-Harquahala Planning Area are regions of known occurrences of and high potential for locatable metallic and non-metallic minerals (Map 3-15). Most of the mines have been inactive for many years because the cost to mine the commodity exceeds the commodity's market value. Several small-scale locatable mines now operate in the planning area. These mines generally operate on a sporadic base, depending on market conditions and financial support. These operations focus on placer gold, lode gold, and some industrial minerals.

The following assumptions were considered when evaluating the RFD for locatable minerals in the Bradshaw-Harquahala Planning Area:

- There would be three to five new small mines per year for the next 20 years and one to two large operations over the next 20 years. There would be 10 or fewer exploration-level operations per year.
- Each new small locatable mineral discovery would occupy less than 20 surface acres, including access. Exploration would disturb an average of 1 to 3 acres. The large mines are expected to be gold heap leach, which might disturb between 200 and 300 acres.
- Most mining would be on the surface, from recent trends in new mine permit applications to BLM.
- The commodity ore would be transported by surface road.
- Most of the surface would not be reclaimed during the life of the mine.

Reasonable Foreseeable Development

There would be three to five new small mines per year for the next 20 years and one to three large mines over the next 20 years. There would be 10 or fewer exploration-level operations per year.

Disturbance to the Decision Area

Each new small locatable mineral discovery would occupy less than 20 surface acres, including access. Exploration on an average would disturb 1 to 3 acres. The large mines are expected to be gold heap leach, which might disturb between 200 and 300 acres.

SALESABLE MINERALS

Background Information and Assumptions

The Bradshaw-Harquahala Planning Area has many locations for saleable mineral resources. Known occurrences (quarries and pits), prospects, and potential locations for saleable material on BLM-administered lands are shown on Map 3-20. Those locations have high potential for saleable mineral resources because they are known to occur. Most of the locations

are actively used for dimension stone, decorative rock, or local construction.

The following assumptions were considered when evaluating the RFD for saleable minerals in the decision area:

- The demand for saleable minerals would increase during the next 20 years as population increases stimulate the building of new roads, structures, and infrastructure.
- An estimated 20 new saleable mineral pits would be permitted in the next 20 years.
- New quarry or pit access would require new road building because those locations are usually sited some distance from existing paved roads.

Reasonable Foreseeable Development

An estimated 20 new saleable mineral pits or quarries would be permitted or reactivated in the next 20 years. The type and volume of saleable minerals disposed are uncertain and would depend on the increase in community development and construction. The Bradshaw-Harquahala Planning Area now has seven decorative rock operations, three sand and gravel operations, and three free use permits. The average disposal tonnages for three types of saleable mineral pits are as follows:

- Decorative rock – an average of 33,000 cubic yards/year/pit for seven active pits that average 40 acres per contract/permit.
- Sand and gravel – 50,000 cubic yards/year/pit from three active pits that average 40 acres per contract/permit.
- The free use permits operate sporadically, producing borrow sand and gravel, averaging less that 10,000 cubic yards/year.

The average annual current sales volume from those active BLM's saleable mineral pits in the Bradshaw-Harquahala Planning Area is 380,000 cubic yards. From the estimated average disposal of 38,000 cubic yards/year/pit from each of 20 new pits during the next 20 years, the disposal of 8 to 10 million cubic yards of saleable mineral materials is projected.

Disturbance to the Decision Area

Each saleable mineral pit would occupy 40 acres, which is the average area for the 10 saleable mineral pits that have active sales records. About 400 total acres would be disturbed by 20 new pits. Disturbance of the land surface would require reclamation at the end of the life of the pits.

4.17.1 From Special Area Designations

***Alternative A* (No Action)**

Under current management in Agua Fria National Monument, in designated Wilderness Areas, and in other areas closed to mineral entry, any potential mineral or energy resource that might have been opened to development would not be developed. Impacts would be long term, but minor. The affected areas are closed to mineral development; therefore, no exploration would occur, and any undiscovered mineral resources would remain undiscovered. In these areas, the potential is low for leasable minerals, moderate for saleable minerals, and varied for locatable minerals. No withdrawn areas have a high potential for locatable minerals and demand for saleable minerals could be met from other sources.

Maintaining the acres now withdrawn from locatable mineral entry and closed to leasable and saleable mineral development would continue to preclude mineral development. Current needs and future demands of public users would be affected. Table 4-4 shows how many acres are closed to the various mining types in each Alternative and Table 4-7 shows the mineral potential closed by mineral type for each alternative.

Alternative B

For Agua Fria National Monument, impacts would be similar to those described for *Alternative A.*

Because Tule Creek ACEC in the Bradshaw-Harquahala Planning Area would be closed to mineral leasing, mineral material disposal, and recommended for closure under the mining laws, any potential minerals or energy resources that might have been available for development would not be developed. Impacts would be long term but are expected to be negligible because of the ACEC's small size. Valid existing rights would be maintained.

If minerals were to be discovered here, they would not be developed, resulting in a loss of economic contribution to local communities, missed opportunity for jobs, missed opportunity for adding revenue to the national fund from the sale of mineral materials, and missed opportunity for extraction of energy resources. Based on current mineral production and demand in the area, the magnitude of impacts would be small.

Withdrawals and closures of this area from mineral activities would prohibit future mineral development and could inhibit the expansion of adjacent mining. Management decisions could lead to effects on developing mineral and energy resources. These effects would affect the local economy. The current needs and expected future demands of public users and county, State, and Federal agencies could be adversely affected under this Alternative, although impacts are expected to be small.

Alternative C

Impacts in Agua Fria National Monument would be the same as those described for *Alternative A* despite potential additions to the existing Wild and Scenic River designation or proposed ACECs.

Impacts would be similar to those described in *Alternative B*, except more area would be closed to mining. Any potential mineral or energy resources would not be developed in the following places in the Bradshaw-Harquahala Planning Area because of (1) their withdrawal from location under the mining laws and (2) closure to leasing and mineral material disposal:

- Tule Creek ACEC and
- Sheep Mountain RNA ACEC.

The prohibition against mineral materials disposal would prevent sale of sand, gravel and decorative rock in:

- Vulture Mountains Raptor Area ACEC, and
- Black Butte ONA ACEC.

Alternative D

Impacts under *Alternative D* would be similar to those described for *Alternative C* in Agua Fria National Monument.

In addition to impacts similar to those described for *Alternative C* in the Bradshaw-Harquahala Planning Area, except that this Alternative has the largest acreage of special area designations. Any potential mineral or energy resources that might have been open to development would not be developed in the following areas:

- Black Butte ONA ACEC,
- Harquahala Mountains ONA ACEC,
- Vulture Mountains ACEC, and
- Sheep Mountain RNA ACEC.

Also, any potential mineral leasing and mineral material sales that might have occurred would not occur in the Belmont-Big Horn Mountains ACEC.

***Alternative E* (Preferred Alternative)**

In the Agua Fria National Monument, impacts under *Alternative E* would be similar to those described under *Alternative A*.

In the Bradshaw-Harquahala Planning Area, acreages closed to various mineral activities is

similar to those for *Alternative A*. However, DFCs for the four ACECs will make many types of mining difficult or cost prohibitive to do. Impacts from this alternative are more similar to *Alternative C.*

4.17.2 From Lands and Realty Management

***Alternative A* (No Action)**

Because the Agua Fria National Monument is closed to mineral entry, no impact is expected.

Under the current management of the Bradshaw-Harquahala Planning Area acquiring non-Federal mineral estate underlying Federal surface holdings in the two RCAs would constitute a net gain of potentially developable mineral resources.

Reconveyed lands in the Black Canyon Corridor are closed to leasing, location, and mineral material disposal. These areas have moderate to high potential for production of small quantities of precious minerals, sand, and gravel. Keeping them closed precludes opportunities for mineral development and a potential stimulus to the economies of Black Canyon City and Cordes Lakes.

Small tract lands are also closed to location. Most are of low potential, but some opportunities to develop locatable minerals may be forgone. Small tract lands are private surface/Federal mineral; therefore, any development could cause conflicts with the surface owner.

Alternative B

Impacts in the national monument are the same as under *Alternative A.*

Under management of the Bradshaw-Harquahala Planning Area, issuance of rights-of-ways, leases, and patents would establish superior rights to later mineral development. These rights-of-way, leases, and patents could also cause temporal or spatial access restrictions. Segregations and withdraws for leases/patents could inhibit mineral development. Authorization of rights-of-way for facilities such as roads, highways, and power lines would benefit locatable mineral operations by providing access and infrastructure.

Land ownership adjustments could result in BLM acquiring or disposing of lands with mineral value and could either increase or decrease opportunities for development. Acquiring more legal access across private or other lands would increase opportunities to explore and develop areas that might not be accessible by other routes.

The opening of reconveyed lands to leasing, location, and mineral material disposal could provide opportunities for mineral development.

The opening of small tract lands to location could provide opportunities to develop locatable minerals. Because small tract lands are private surface/Federal mineral, any development could cause conflicts with the surface owner.

Alternative C

Impacts would be similar to those described under *Alternative B,* except:

Within the Bradshaw-Harquahala Planning Area, the opening to leasing, location, and mineral material disposal of only those reconveyed lands with high potential for minerals could provide fewer opportunities for developing mineral resources than under *Alternative B.*

The opening to location of only those small tract lands with high locatable mineral potential would provide fewer opportunities for developing locatable minerals than would *Alternative B*. There would also be less conflict with surface owners.

Alternative D

Impacts would be similar to those described in *Alternative B*, except impacts of keeping all reconveyed lands and small tract lands closed to minerals development would be the same as *Alternative A*.

***Alternative E* (Preferred Alternative)**

Impacts would be similar to *Alternative B*, except small tract lands would remain closed to mineral entry, denying opportunities for locatable mineral development on those parcels, like in *Alternative A*.

In addition, reconveyed lands would be opened to mineral development as in *Alternative B*, except riparian areas would be closed to mineral material sales. No impacts are expected from this closure.

4.17.3 From Management of Soil, Air, and Water Resources

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

No impacts are expected in the Agua Fria National Monument, since the monument is closed to mineral entry.

In the Bradshaw-Harquahala Planning Area, managing soil resources requires mitigating impacts to topsoil by removing, stockpiling, and replacing soil and/or reclamation requirements to develop suitable substitutes. This mitigation would increase the cost of mining and in some cases might make mining uneconomical. Management objectives seeking to enhance soil stability would limit mining in areas with highly erodible soils and steep slopes.

Other requirements can be placed on mineral operations to protect ground and surface waters and to limit impacts on riparian areas. These requirements would increase exploration and mining costs, potentially making some locations uneconomical.

Managing air quality imposes limits on the impacts of mining by requiring reduced particulates, dust, and emission of hazardous air pollutants. As with soil and water requirements, air quality requirements would increase the cost of mineral exploration and development and might make some locations uneconomical.

4.17.4 From Biological Resource Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

There are no impacts expected in the Agua Fria National Monument, since the monument is closed to mineral entry.

In the Bradshaw-Harquahala Planning Area, tortoise habitat restrictions decrease opportunities for developing mineral material resources, especially boulder sales. Required mitigation to eliminate or reduce impacts from mining could result in more expenses and longer permitting times for developers.

Wildlife stipulations and mitigation would increase operating costs and permitting timeframes and; to a lesser extent, might require relocation of discretionary mineral actions. Development locations near important wildlife habitat might be constrained by the following:

- seasonal use restrictions,
- buffer zones, and
- noise controls.

Mineral development is restricted in areas known to contain Threatened and Endangered (T&E) species. The discovery of T&E species on a site might interrupt operations.

4.17.5 From Cultural Resource Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

There are no impacts expected in the Agua Fria National Monument, since the monument is closed to mineral entry.

In the Bradshaw-Harquahala Planning Area, increased costs of mineral development and delays in the evaluation and approval of proposed activities could result from the following requirements:

- to survey for cultural resources before any surface disturbance and
- to mitigate impacts on cultural resources found before or during surface disturbance.

4.17.6 From Paleontological Resource Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

Paleontological resource management is not expected to affect minerals and energy resources. The discovery of paleontological resources during development could increase the costs of mineral extraction.

4.17.7 From Recreation Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

There are no impacts expected in the Agua Fria National Monument, since the monument is closed to mineral entry.

Protecting important recreational areas through recreation resource allocations such as SRMAs might minimize potential surface disturbances from mineral development. They also limit the area where development can occur. Though most of these allocations do not close areas to mining, compliance with management prescriptions would increase development costs, making some locations uneconomical to develop.

4.17.8 From Visual Resource Management

***Alternative A* (No Action)**

Under *Alternative A* no VRM classes have been established. For the most part, visual resources have been managed to Class III. Visual resource management is not expected to affect minerals and energy resources.

***Alternatives B, C, D,* and *E* (Preferred Alternative)**

While the impacts of VRM Class III and Class IV to mining would be similar and comparable to what is already required in current reclamation standards, Class IV management provides added flexibility. VRM Class I or II objectives and mandatory compliance with them would increase the costs of any potential mineral development. In many cases, discretionary mineral development and related infrastructure would not be compatible with VRM objectives, which would result in excluding those forms of mineral development. Table 4-6 shows the VRM Classes that would be allocated in each Alternative.

4.17.9 From Rangeland Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

Rangeland management is not expected to affect mineral and energy's resources.

4.17.10 From Minerals Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

Impacts to mineral exploration and development result from prescriptions intended to manage and protect other resources; therefore, no impacts are expected.

4.17.11 From Fire Management

Alternatives A (*No Action*), B, C, D,* and *E* (Preferred Alternative*)

Current conditions would be maintained. Prescribed burns would affect access and operations in Agua Fria National Monument because some areas would be closed during prescribed burning. Fire management would be a benefit for mining by providing more protection against devastating wildfires. Such impacts would generally be short-term and would not affect the long-term development potential for minerals and energy.

4.17.12 From Wild Horse and Burro Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

Wild horse and burro management under any Alternative is not expected to affect minerals and energy resources.

4.17.13 From Land Health Standards

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

Compliance with Land Health Standards would require more stringent reclamation standards, resulting in higher reclamation and bonding costs and a greater delay in bond release.

4.17.14 From Management of Transportation and Public Access

***Alternatives A* (No Action), *B, C, D* and *E* (Preferred Alternative)**

Transportation management requirements impose more limits on the number and location of roads and require mitigation to reduce impacts. Travel management provisions under all Alternatives would require authorization to drive off-road to access mining claims or conduct exploration. Fewer access roads would inhibit access for prospecting. Improved road conditions leading to improved access would facilitate operating existing and potential mines.

4.17.15 From Management of Wilderness Characteristics

***Alternative A* (No Action)**

There are no expected impacts.

Alternatives B* and *C

Lands allocated to maintain or enhance wilderness characteristics would be closed to mineral material disposal. This would help preserve the natural and primitive characteristics of these areas.

Alternative D

Impacts would be the same as *Alternative B* except that in addition to closing mineral material disposal, lands allocated for management of wilderness characteristics would also be closed to mineral and geothermal

leasing. Under this Alternative lands allocated to manage wilderness characteristics would be withdrawn from mining laws. Closing these areas to mining activities would prevent the exploitation of potential resources, but would ensure preservation of natural and primitive characteristics more than other Alternatives.

***Alternative E* (Preferred Alternative)**

All public lands within the planning area would be open to mining activities except for legislatively withdrawn areas and other withdrawn and segregated areas. As a result areas allocated to manage wilderness characteristics would have no impact.

4.18 Impacts on Fire and Fuel Resources

4.18.1 From Special Area Designations

***Alternative A* (No Action)**

Two ACECs under current management limit motorized vehicles. This management is not expected to affect wildfire response, suppression, or fuel management, because traffic restrictions would not apply to either emergency or administrative needs.

The one RCA and two MRMAs, within Agua Fria National Monument, would be replaced by Agua Fria National Monument management. The area of limited development and access would increase. These limitations would affect fire by decreasing opportunities for accidental human-caused ignition. Also, fewer improvements and structures would affect suppression.

Wilderness designations restrict the amount and type of fire suppression. A total of 11 percent (96,820 acres) of the Bradshaw-Harquahala Planning Area is wilderness, where suppression and access are limited. Additionally, no mechanized equipment can be used in designated wilderness areas.

Alternative B

In Agua Fria National Monument designating the Bloody Basin Road Back Country Byway would likely increase recreation use of the area and would proportionally increase opportunities for human-caused ignitions.

In the Bradshaw-Harquahala Planning Area designating the Constellation Mine Road Back Country Byway could increase recreation use of the area and would proportionally increase opportunities for human-caused ignitions.

Alternative C

In Agua Fria National Monument designating four new ACECs would limit vehicular travel and vehicular access to all or portions of the ACECs. *Alternative C* is not expected to have any short-term impacts on wildfire response suppression or fuel management because the traffic restrictions would not apply either to emergency or administrative needs.

The Harquahala Mountains ACEC prohibits grazing and prohibiting grazing could increase fine fuels on the surface. This buildup could result in easier ignition and create a more continuous fuel bed that could increase the spread of fire.

The Vulture Mountains, Black Butte, and Sheep Mountain RNA ACECs would increase the area of limited development and access. These limitations could affect fire by decreasing opportunities for accidental human-caused ignition. They would also decrease improvements and structures that would affect suppression.

Alternative D

Impacts to fire under *Alternative D* would be similar to those described under *Alternative C.*

***Alternative E* (Preferred Alternative)**

The impacts to fire management from Special Area Designations would be similar to those described for *Alternative C.*

4.18.2 From Lands and Realty Management

***Alternative A* (No Action)**

Continued use of the existing utility rights-of-way is expected to temporarily affect fuels and fire because of ground disturbance and increased opportunities for ignition during operation and maintenance.

Building more utilities, transportation corridors, and communications sites would affect fire by increasing opportunities for accidental human-caused ignition. More improvements and structures would do the following:

- affect suppression and costs by placing on the ground more features that could require protection from a wildfire,
- present more hazards, such as flight hazards from overhead power lines or explosion hazards of buried gas pipelines, and
- create restrictions to prescribed burning or fire suppression operations.

Historically, maintaining and building new utility projects have had minor impacts to the Fire Management Program. Impacts to vegetation and increases in fine fuels due to ground disturbance would be minimal and short term. Increased opportunities for ignition during operation and maintenance are expected to have negligible effects.

Impacts from disposal of as much as 54,370 acres of Federal land outside the MUs could include redistributing the overall Federal land ownership and consolidating Federal lands into more contiguous management blocks. This disposal could reduce fire suppression and management responsibilities and increase their effectiveness. Suppression costs could decrease. Management would be more contiguous across the landscape (not broken by parcels of non-BLM ownership) with a resultant increase in the efficiency of operations. Depending on post-disposal land use, land disposal could affect both fire suppression and fuels conditions. Continued wildland uses and management would probably have negligible impacts. However, conversion to development uses would increase human populations and change ignition potential, fire behavior, and risk decisions. Additionally, visitor use on adjacent public lands could increase which could increase the potential for accidental human-caused fire starts. Developing these parcels would also do the following:

- expand the WUI,
- potentially increase fire suppression complexity, and
- costs increase the risk of public loss of life or property in the event of a wildfire.

Alternative B

Impacts would be similar to *Alternative A,* except potential disposal acres would be 58,400.

Alternative C

Impacts would be similar to *Alternative A*, except potential disposal acres would be 49,100.

Alternative D

Impacts would be similar to *Alternative A,* except no acres would be selected for disposal, so there would be no impacts related to land disposal.

***Alternative E* (Preferred Alternative)**

Impacts would be similar to *Alternative A*, except potential disposal acres would be 38,755.

4.18.3 From Management of Soil, Air, and Water Resources

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

Management objectives include meeting air quality standards. Meeting air quality standards limits the amount of prescribed burning in both planning areas. Every prescribed fire requires an approved prescribed burn plan that lists predetermined prescription criteria for weather and fuel conditions. The plan also includes smoke management criteria, which are important to determining the complexity of the prescribed fire. These criteria define measures that would be taken to reduce smoke impacts on sensitive receptors from prescribed fire. All prescribed fires must be approved by the ADEQ before being implemented. State air quality regulations enforced by ADEQ meet or exceed Federal standards.

Implementing prescribed fire in fire-adapted environments and fuel treatments in other high-risk locations would improve watershed conditions, increase soil cover, and promote proper water flows.

4.18.4 From Biological Resource Management

***Alternative A* (No Action)**

In Agua Fria National Monument, fire management is affected by the area where endangered fish exist. The size of prescribed fires is limited by a restriction in the biological opinion that not more than half of a watershed can be burned during prescribed fires. Also, canyon areas cannot be burned. These restrictions affect fire by limiting the areas where prescribed fires can occur. After a burn, fish habitat must be monitored for erosion and soil movement into streams, which might affect water quality.

The impacts of biological resource management on fire suppression would consist of restrictions imposed on suppression strategies to protect priority habitat and species from disturbance from heavy equipment. Examples of these restrictions would be (1) prohibiting heavy equipment such as dozers in building firelines and (2) restricting fire vehicles to existing roads.

In both planning areas, sensitive and T&E species might limit actions on fuel treatments (such as what vegetation types can be treated in specific areas or at specific times), surface disturbances, and fuel treatment methods allowed. Seasonal restrictions to protect sensitive and T&E species affect fire management by not allowing for prescribed burning and fire suppression during certain times of the year or in some areas such as in fawning habitat during pronghorn fawning season.

The allocation of WHAs also affects Fire Management. They would do the following:

- limit or mitigate vehicular access;
- prohibit development of new recreational facilities, improvements, and structures; and
- reduce public visitation in these managed areas.

These actions are expected to affect fire by decreasing the occurrence of human-caused fire ignitions and overall suppression costs

***Alternatives B, C, D,* and *E* (Preferred Alternative)**

Impacts under *Alternative B* would be the same as under *Alternative A,* except that some closures of vehicle routes that conflict with biological resource management might affect fire management by (1) reducing visitor use to the area and (2) decreasing the opportunity for human-caused fire ignitions.

4.18.5 From Cultural Resource Management

***Alternative A* (No Action)**

Protecting cultural resources, results in the use of Minimum Impact Suppression Tactics (MIST) during suppression. When implementing MIST, fire managers use the fewest fire suppression resources, and least-impacting tools and equipment to effectively manage and suppress fire, while (1) meeting fire management protection and resource objectives and (2) minimizing the impact to cultural resources and the landscape. Examples of MIST used by fire managers include the following:

- limiting fire vehicles to established road rights-of-way;
- burning out from existing roads, trails, and natural breaks; and
- placing firelines and retardant lines away from known cultural sites.

MIST applies indirect attack strategies more often than direct attack strategies. Where areas are not surveyed, cultural sites could be unintentionally damaged, especially flammable structures. Mitigation measures taken by fire managers to protect cultural sites in suppression and prescribed fire would reduce the known and unknown impacts to cultural resources. The expected results include more area burned by wildfires and increased suppression costs.

In prescribed fires, protecting cultural resources results in the following measures:

- relocating planned firelines,
- adjusting the size of burnblocks,
- mitigating adverse effects by removing vegetation around cultural sites to protect them, and
- determining where prescribed fires might or might not be planned from known cultural resources.

Such measures would have the following results:

- increasing project costs to protect cultural sites;
- spending more time and cost in planning, and
- excluding some areas from burning because of the presence of cultural resources.

***Alternatives B, C, D,* and *E* (Preferred Alternative)**

In Agua Fria National Monument developing High and Moderate public use cultural site interpretation would affect fire and fuel management because of increased recreation use of the area and the developing of visitor services, including structures. This outcome would affect fire management by increasing the risk of accidental human-caused ignition. This increased risk would be minimal during the peak fire season (summer) because most visitor use would occur during the late fall, winter, and early spring. Increased visitor use is expected to only slightly affect opportunities for fire use or prescribed fire.

The number of improvements and structures could also increase, which could lead to changes in suppression decisions and commitments of suppression resources. *Alternative B* would have the most sites and facilities open to visitation and public use. *Alternative B* is also expected to have the most public visitation of all Alternatives.

In the Bradshaw-Harquahala Planning Area, allocating SCRMAs and developing sites for interpretation would increase the risk of accidental human-caused ignition. These measures would also increase the number of improvements and structures, which could change suppression decisions and commitments of suppression resources. The relative size of impacts would be as follows:

- greatest under *Alternative B* (316,103 acres of SCRMA, representing 35 percent of the planning area)

- intermediate under *Alternative C* (276,527 acres of SCRMA, representing 31 percent of the planning area)
- least under *Alternative D* (125,292 acres of SCRMA, representing 14 percent of the planning area)

See Tables 2-3, 2-4, and 2-5 to view the different areas allocated to different use levels under each Alternative.

4.18.6 From Paleontological Resource Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

There are no impacts expected from paleontological resource management.

4.18.7 From Recreation Management

***Alternative A* (No Action)**

Allowing continued open areas within the boundaries of the Lower Gila North Management Framework Plan (BLM 1983) will increase the risk of human-caused fire ignitions as recreation use increases. In addition, allowing target shooting anywhere would increase the potential for accidental human-caused ignitions. Shooting is a common cause of wildfire in some areas.

Alternative B

It is expected that increases in recreation visitation will result in increased occurrences of human-caused ignition. Allowing dispersed camping with few limitations could also increase the risk of human-caused ignitions.

In both planning areas allocations of Front Country RMZs, Back Country RMZs, and SRMAs would result in allocating roads and trails for commercial and motorized competitive events as well as motorized recreation. In addition, staging and camping areas would be developed to meet the high demand for recreation. These measures would affect fire by increasing the risk of accidental human-caused ignition. The potential for human-caused fire starts would increase as a result of increases in the following:

- visitor use,
- target and recreational shooting,
- motorized recreation use confined to designated routes, and
- unauthorized off-road use.

The potential for accidental human-caused fire starts would increase as a result of dispersed non-motorized non-commercial individuals, group activities, and public camping not under SRPs. The presence of improvements and increased visitor use could change suppression decisions, prioritization of resources, and resulting costs.

Alternative C

Impacts in planning areas, Front/Back Country RMZs and SRMAs, would be similar to those described for *Alternative B.* In SRMAs where vehicles use is restricted potential human-caused ignitions would decline.

Alternative D

Impacts in planning areas, Front/Back Country RMZs and SRMAs would be similar to those described for *Alternatives B*, except there would be more restrictions on vehicle use and risk of human-caused ignitions would decline.

***Alternative E* (Preferred Alternative)**

Impacts for *Alternative E* are the same as those described for *Alternative B*.

4.18.8 From Visual Resource Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

There are no impacts expected.

4.18.9 From Rangeland Management

***Alternative A* (No Action)**

Current grazing practices affect fire management in many ways. Improvements designed for managing livestock, such as water facilities, fences, corrals, and other structures, present a risk of property loss in the event of a wildfire, as well as potential hazards to fire fighters and fire operations. On the other hand, many wildfire suppression actions depend on water from range improvements.

Livestock removing forage, especially light fuels in the form of grasses and forbs, can reduce the potential of a site to carry fire and result in fewer fires of lower intensity or lower rates of spread. A history of grazing, especially improper grazing, can convert ecological types. Conversion of grasslands or ecological types with naturally high grass components to types with higher woody species can result in lower fire frequencies but higher fire intensities when these converted types do burn. In these cases, wildfires might not burn as often, but the likelihood of a catastrophic fire increases.

Livestock grazing in the Sonoran and other western desert ecosystems has led to rapid invasion of Mediterranean annual grasses and forbs, most notably red brome (*bromus rubens*) and downy brome (*bromus tectorum*), which have increased the fire frequency in ecosystems where the natural vegetation is not fire adapted. The potential outcome of this invasion is the possibility of creating a fire-dependent plant community consisting mainly of non-native invasive annual plants, and the eventual loss of native desert vegetation in those places.

Woody species have encroached on the natural desert grasslands, reducing natural fire frequency and reducing light fuels to carry natural fires. As a consequence, a prescribed burning program has been developed to reduce woody species and encourage recovery of natural grasses. Many factors affect the success of the prescribed fire program, not the least of which is the assurance of adequate amounts of fuel to carry a fire. Livestock grazing in areas planned for burning can remove enough fuel to reduce or eliminate the opportunity to successfully burn. Rest from livestock of a season or more in those same pastures can also increase the opportunity for natural fire starts from lightning or from unplanned human ignition.

In Sonoran desert vegetation communities, prescribed burning is confined to the fire adapted Arizona Interior Chaparral vegetation communities, mainly in the foothills of the Bradshaw Mountains. Livestock grazing in those areas would have little effect on prescribed or wildland fire operations. In desertscrub and other desert communities, wildfires depend on large volumes of ephemeral annual grass and forb production, generally after winters with above-average precipitation. Livestock operators commonly apply for increased livestock numbers to take advantage of abundant forage. In years where the amount of ephemeral production is marginal, high livestock numbers can reduce the potential of large fires. In years with extraordinary ephemeral production, perhaps 1 year in 10, livestock would not affect fire potential.

Riparian areas are not typically in a prescribed burn treatment area, but specific vegetation objectives might allow for prescribed fire use.

***Alternatives B, C, D,* and *E* (Preferred Alternative)**

In Agua Fria National Monument *Alternative B* would allow some naturally ignited fires to burn

if defined prescriptive conditions are being met. This could reduce the cost of prescribed burning, but may increase the risk of escaped wildfires. Nevertheless, impacts would be similar to those under *Alternative A.*

4.18.10 From Minerals Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

The Bradshaw-Harquahala Planning Area allows new mineral entry as well as development of existing mineral rights. The result is an increase in human activity and in the probability of human-caused fire ignitions. Development associated with mining also increases the risk and complexity of wildland fire suppression operations. Since the Agua Fria National Monument is closed to new mineral entry, there are no fire impacts related to mineral development.

4.18.11 From Fire Management

***Alternative A* (No Action)**

In both planning areas current fire management practices require full suppression using suitable management response on all wildfire starts (both human and natural ignition caused). Fire suppression on small-fire starts can prevent fires from becoming large and harming resources but does not allow for wildland fire use under a predetermined fire prescription. However, current management practices allow only for implementing management-ignited prescribed fire.

In the Bradshaw-Harquahala Planning Area, 14,000 acres have been selected for prescribed fire treatments in the Weaver Mountains. Prescribed fire objectives are to conduct multiple prescribed fire treatments over 5 to 10 years to treat hazardous fuel accumulations in interior chaparral vegetation. The treatments would create a diverse mixed-aged stand of interior chaparral. Creating a mosaic pattern of burned and unburned areas in the treatment area would reduce the threat of large catastrophic wildfires and maximize benefits to wildlife and livestock grazing.

Existing roads and disturbed areas would be used in fire suppression and prescribed fire to avoid impacts to other resources, especially cultural resources.

The encroachment of urban development on adjacent private lands could affect wildland fire suppression strategies and tactics, depending on the time of year and intensity of wildfires. Wildland Urban Interface areas (WUI) would not allow the option of using wildland fire. WUI would also affect the following aspects of prescribed fire operations on public lands:

- limiting the location of burnblocks,
- altering firing operations,
- increasing the sensitivity to smoke and smoke management,
- impairing visibility and public health, and
- increasing prescribed fire cost because of the added work to protect WUI areas, such as building new firelines and adding fire resources (engines, firefighters, helicopters).

***Alternatives B, C, D,* and *E* (Preferred Alternative)**

In both planning units some wildland fire would be allowed if defined prescriptive conditions are being met. Wildland fire use would allow for fire to play its natural role, especially in the Agua Fria National Monument tobosa grasslands. Wildland fire use would do the following:

- help to maintain and enhance this grassland ecosystem,
- encourage perennial grass species, and
- reduce the encroachment of woody species.

Wildland fire use would be beneficial in both planning areas except in the Sonoran Desert vegetation communities, which constitute the majority of vegetation communities in the Bradshaw-Harquahala Planning Area.

Suppression impacts would be similar to those described for *Alternative A.*

4.18.12 From Wild Horse and Burro Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

Wild horse and burro management would not affect fire management under any of the Alternatives.

4.18.13 From Management of Transportation and Public Access

***Alternative A* (No Action)**

Restricting vehicles to existing roads and trails in the Phoenix Resource Management Plan (BLM 1988a), would reduce the potential for accidental human-caused ignitions. The limits on motorized vehicles could reduce the potential for human-caused wildfire ignitions. This restriction affects fire suppression strategies as well as options for fuel treatment. Limits on vehicle access also affect the number and type (OHV versus pedestrian) of visitors to these areas, thus reducing the probability of human-caused ignitions.

The probability of human-caused fire continues to increase as a result of an expanding human population. Initially, no major impacts to the Fire Management Program are expected, but as increases in vehicle travel on designated routes continue, the potential for human-caused fire will also increase.

Alternative B

Impacts to fire under *Alternative B* would be similar to those described for *Alternative A*. Road closures would affect fire management by reducing access to fires by ground initial attack resources. This reduction would have the following impacts:

- increased initial attack response time,
- limited access to fires,
- fewer roads to use as firelines,
- larger fires (more acres burned), and
- increased fire suppression costs

In both planning areas confining vehicles to designated routes would reduce the potential for accidental human-caused ignitions. This restriction is especially important in grassland fuel types. In SRMAs where vehicle use is restricted potential human-caused ignitions would be reduced.

Closing roads would have a long-term impact on prescribed fire by reducing the number of roads that could be used as firelines (fuel breaks) in prescribed burning. Road closures might result in the need to build more firelines to safely implement prescribed fires and would increase the cost of prescribed burning.

Alternative C

The impacts under *Alternative C* would be the same as under *Alternative B*, except that Alternative C would close and add limitations to more vehicle routes than *Alternative B* would.

Alternative D

The impacts under *Alternative D* would be the same as under *Alternative* B, except that more closures of vehicle routes are expected under *Alternative D* than under *Alternative C.*

***Alternative E* (Preferred Alternative)**

The impacts under *Alternative E* would be the same as under *Alternative B*.

4.18.14 From Management of Wilderness Characteristics

***Alternative A* (No Action)**

There are no areas under consideration for management of wilderness characteristics; therefore, there are no impacts on fire management.

***Alternatives B, C, D,* and *E* (Preferred Alternative)**

For both planning areas, management of wilderness characteristics may impact fire suppression by preventing the construction of new firelines using heavy equipment. Implementation of appropriate management response for values at risk will offset the impacts from the potential loss of heavy equipment. Management of wilderness characteristics is not anticipated to have a negative impact on either fire suppression or fuels treatment within the designated areas.

4.19 Impacts on Wild Horses and Burros

4.19.1 From Special Area Designations

***Alternative A* (No Action)**

No impacts are expected to the animals present or their habitat elements as a result of continuing to implement the Hells Canyon or Hummingbird Springs Wilderness Areas. In the event of a gather in these areas, a site-specific analysis would be completed for the use of motorized equipment. The Harquahala burro herd is small. According to the manageability analysis in Appendix G, the herd is probably too small to contain enough genetic diversity to be a viable population. Removing any burros would reduce the herd's genetic diversity even further.

Alternative B

Tule Creek ACEC would be fenced to deny burro and livestock access. The area of the ACEC and the loss of forage within it would be so small that the effect on burros would be negligible. No adjustment in the Appropriate Management Level (AML) of burros would be required as a result of this action.

No special area designations would be created under *Alternative B* in the Harquahala HA.

Alternative C

Under *Alternative C*, Tule Creek and Sheep Mountain RNA ACECs would be designated in or near the Lake Pleasant HMA. Excluding livestock from Tule Creek ACEC would have the same impacts as described for *Alternative B*.

Designating the Harquahala Mountains ONA ACEC would not affect the burro herd.

Alternative D

Impacts to the Lake Pleasant HMA would be the same as described for *Alternative C*.

Alternative D would designate two ACECs in the Harquahala HA: the Harquahala Mountains ONA ACEC and the Bellmont-Big Horn Mountains ACEC. Despite the larger area in ACEC designations, impacts to burros would be the same as described for *Alternative C.*

***Alternative E* (Preferred Alternative)**

Impacts to the Lake Pleasant HMA would be the same as described for *Alternative C.*

Designating the Harquahala Mountains ONA ACEC would not affect the burro herd.

4.19.2 From Lands and Realty Management

***Alternatives A* (No Action), *B, C, D, and E* (Preferred Alternative)**

There are no impacts expected.

4.19.3 From Management of Soil, Air, and Water Resources

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

No impacts to burros are expected from the management of soil, water, or air resources.

4.19.4 From Biological Resource Management

***Alternative A* (No Action)**

Under No Action wild burros would continue to compete with native wildlife for forage and water. Developing water resources such as springs and seeps, which are designed to protect ecological functions, could affect wild burros by improving the habitat in the Lake Pleasant HMA and Harquahala HA. Projects that encourage developing a more reliable water source could increase the forage production in the vicinity. Improvements, however, could include the installing of fences to prohibit cattle and wild burros from using the water sources, leading to a decrease in available water supply and less available habitat.

***Alternatives B, C, D,* and *E* (Preferred Alternative)**

In the Lake Pleasant HMA impacts would be the same as described for *Alternative A*.

In the Harquahala HA allocation of the Harquahala Mountain WHA would not affect burros.

4.19.5 From Cultural Resource Management

***Alternative A* (No Action)**

Reducing or eliminating impacts of land uses on cultural resources as identified through study plots could require installing fences, which could affect the wild burros by limiting their available range. The potential fenced areas would be small, only negligibly affecting available burro forage or habitat.

***Alternatives B, C, D,* and *E* (Preferred Alternative)**

Wild burros could be affected by allocating the following:

- Lake Pleasant/Agua Fria SCRMA in the Castle Hot Springs MU, which includes 21,342 acres of the Lake Pleasant HMA, and
- Harquahala Mountains SCRMA in the Harquahala Mountains MU, which includes 24,299 acres of the Harquahala HA.

Any installing of fences to protect areas could limit the available range of wild burros. Any fence is expected to be small and to negligibly affect burros. Increasing visitor facilities could pressure wild burros to migrate to less developed areas, possibly increasing human–burro interactions. Wild burros that become accustomed to human interactions are more likely to congregate around public areas, increasing the likelihood of injury to both wild burros and people. Additionally, with the increase in travel routes, recreational trails, and above-ground features (restrooms, picnic tables, benches, trash receptacles, interpretive signs), wild burros would be affected by the quality and quantity of diminishing wild burro habitat.

4.19.6 From Paleontological Resource Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

There are no impacts expected.

4.19.7 From Recreation Management

***Alternative A* (No Action)**

Increasing OHV use could affect wild burros by increasing the possibility of vehicle-burro conflicts. Also, increases in recreation use could slightly reduce the amount of available forage from disturbance caused by camping, cross-country vehicular travel, and other recreation activities. The incidence of burro-human encounters could also increase, increasing the risk of injury to both people and burros.

***Alternatives B, C, D,* and *E* (Preferred Alternative)**

Recreational use on designated motorized vehicle routes, in organized competitive events, and in developed staging/camping areas could decrease the amount of available habitat for wild burros and increase the risk of bodily injury to the wild burros during these events.

Closing vehicle routes could decrease the number of vehicle-burro conflicts. Areas allocated to non-motorized settings could help minimize impacts to vegetation from motorized recreation, increasing available forage.

4.19.8 From Visual Resource Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

There are no impacts expected.

4.19.9 From Rangeland Management

***Alternative A* (No Action)**

Implementing Rangeland Health Standards (Land Health Standards) *and Guidelines for Grazing Management* (Rangeland Management) could improve overall vegetation, soil, and water conditions in Lake Pleasant HMA and Harquahala HA.

Maintaining existing authorized grazing allotments could give burros more water sources. Grazing practices, however, increase competition for available forage and water.

Alternative B

Impacts are expected to be the same as *Alternative A*, except building fences or implementing other barrier restrictions to riparian grazing during winter (November 1 to March 1) could affect wild burros. Areas excluded from livestock use would restrict wild burro access as well. These restrictions could affect the availability of forage and water for wild burros by increasing competition and decreasing available range size.

Alternative C

Expected impacts would be similar to those under *Alternative B.*

Alternative D

Eliminating all livestock grazing in the Bradshaw-Harquahala Planning Area would eliminate burro-cattle competition for forage and water. Unneeded grazing improvements would also be eliminated, which could lead to a decrease in available water sources for wild burros. Fences and cattleguards would likely be removed, which could expand the wild burros' available range.

***Alternative E* (Preferred Alternative)**

Impacts would be similar to those under *Alternative B.*

4.19.10 From Minerals Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

There are no impacts expected.

4.19.11 From Fire Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

There are no impacts expected.

4.19.12 From Wild Horse and Burro Management

***Alternative A* (No Action)**

Retaining the current Lake Pleasant HMA and managing the wild burros on BLM-administered public lands consistent with the Wild Horse and Burro Act of 1971 (WHBA) would potentially enhance the genetic viability of this herd by maintaining a thriving ecological balance. The social structures of the herd could be disrupted by removing nuisance animals when they are reported and by gathering excess burros from the Lake Pleasant HMA to achieve the AML. Current plans prescribe removing all burros from the Harquahala HA.

***Alternatives B, C, D,* and *E* (Preferred Alternative)**

Impacts to wild burros in the Lake Pleasant HMA would be similar to those described under *Alternative A.*

According to the herd manageability analysis in Appendix G, the Harquahala HA is not manageable. The herd area would not become a HMA. Nuisance burros and burros damaging sensitive habitats can be removed as funds are available. The impact of this action could be eventual removal of all burros in this HA.

4.19.13 From Management of Transportation and Public Access

***Alternative A* (No Action)**

Increasing OHV use on existing and undesignated route networks, and increasing levels of crosscountry OHV use in the western part of the Bradshaw-Harquahala Planning Area, could affect wild burros by increasing the possibility of vehicle-burro conflicts and cause a loss of habitat. Also, increases in motorized recreation use could slightly reduce the amount of available forage from disturbance caused by cross-country vehicular travel. Moreover, the incidence of burro-human encounters could also increase, elevating the risk of injury to both people and burros.

***Alternatives B, C, D,* and *E* (Preferred Alternative)**

Wild burros and their movement and behavior are influenced by the presence of motorized and non-motorized trail users. Recreational use on designated motorized vehicle routes and route systems could decrease the amount of available habitat for wild burros and increase the risk of bodily injury to the wild burros during these events. Increasing levels of use by visitors on designated non-motorized trails would further fragment burro habitat and cause burro to move to other areas. Burros would also be harassed by both motorized and non-motorized visitors.

Closing vehicle routes as presented in the range of Alternatives could decrease the number of vehicle-burro conflicts. Areas allocated to non-motorized settings could help minimize impacts

to vegetation from motorized recreation, increasing available forage.

4.19.14 From Management of Wilderness Characteristics

***Alternative A* (No Action)**

There are no impacts to wild burros, because no lands are allocated to the management of wilderness characteristics.

***Alternatives B, C, D* and *E* (Preferred Alternative)**

The maintenance and enhancement of lands with wilderness characteristics would reduce the number of motorized vehicle routes, end cross-country vehicle travel, and maintain ecological conditions. Overall, this allocation would have minimal impacts on the number or location of wild burros. However, closing specific vehicle routes could decrease the number of vehicle-burro conflicts. Areas allocated to non-motorized settings could help minimize impacts to vegetation from motorized recreation, which would increase the available forage. The level of harassment of wild burros would be less in areas managed for wilderness characteristics since most of the areas have few trails and overall lower levels of visitation than motorized settings. Increased levels of primitive recreation into burro use areas could lead to the harassment of burros and their movements away from hikers, equestrians, and campers. This would be significant only if the visitors occupy critical burro watering areas during periods of heat stress.

4.20 Impacts on Transportation and Public Access

A route network for access and recreation would be designated for Agua Fria National Monument as part of the RMP. For the Bradshaw-Harquahala Planning Area, designating routes is to be completed in 5 years after the plan is approved. To understand the impacts of routes and access in the Bradshaw-Harquahala Planning Area for the RMP Alternatives, a model route system was developed. The model system is partially based on the inventory and the evaluation process that was performed to develop the alternative route networks for Agua Fria National Monument. The preliminary route model and general approach to the route designation process are in Appendix N. The general assumptions for developing the model route system are outlined below

- The routes total 2,240 miles, excluding highways.
- The route total is based on the new route inventory where it has been completed and on Arizona Land Resource Information System (ALRIS) and county data where the inventory is not complete.

The approximate miles of routes in management zones are shown in the route distribution on Table 4-8.

4.20.1 From Special Area Designations

***Alternative A* (No Action)**

The Agua Fria National Monument would be closed to cross-country motorized travel to protect the monument's objects. Existing routes would remain open. No impacts are likely to occur unless monument resources are found to

be damaged. Closing OHV routes or activity areas to protect monument resources could limit recreation in some areas, but resources would be protected for future activities.

The five designated wilderness areas encompassing 96,820 acres within the Bradshaw-Harquahala Planning Area would remain closed to motorized vehicle use. Motorized uses associated with the Harquahala Mountain Backcountry Byway would continue with no impacts on current opportunities.

The Harquahala Mountain Summit Backcountry Byway would remain as currently administered. Transportation and Public Access uses would continue to be positively impacted due to the interpretation, staging areas, amenities, route markings and periodic maintenance.

Alternative B

Most motorized routes would remain open to vehicular travel in Agua Fria National Monument (see section 2.3.1.8), but monument lands would remain closed to cross-country motorized travel to protect the monument's objects. All travel by motorized and mechanized vehicles would be restricted to designated routes as in *Alternative A.*

Table 4-8. Route Distribution (in miles)

Management Area	Alt A	Alt B	Alt C	Alt D	Alt E
ACECs	0	0.2	19	0	143
Areas alloc to maintain/ enhance wilderness characteristics	0	47	9	0	35
ERMA and SRMA	2,240	2,038	1,861	1,645	1,850

The route system, developed though an interdisciplinary evaluation process, would enhance travel and access opportunities for motorized recreation by creating loop trails, allowing increased touring and greater public access. No other Special Area Designations are proposed within the monument, so there are no additional effects.

Designated wilderness areas in the Bradshaw-Harquahala Planning Area and the Harquahala Mountain Summit Backcountry Byway would have the same impacts as *Alternative A.*

The Constellation Mine Road Backcountry Byway would have a positive effect on the travel and transportation network. Increased management would result in more positive visitor experiences. Use would likely increase on the road area which may negatively impact local residents since additional litter, trespass and dust are likely. Improved management by signing, mapping and volunteers could lessen the impacts to local residents.

Alternative C

Impacts in Agua Fria National Monument would be similar to *Alternative B,* except more routes would be closed. 129 miles, or 69.7 percent, of routes would remain open to vehicular travel. Within the monument's Silver Creek ACEC, 0.45 miles of route would be closed to vehicle use to maximize protection of the Gila Chub.

The Bloody Basin Road Backcountry Byway would improve the opportunity for touring the main use corridor in the monument, thus allowing more visitors to experience the monument. Additional use could increase noise, and litter/dust could negatively affect some visitors' experiences. Impacts to the monument would be minimal if mitigation of these effects were engaged.

Impacts on the suitability of the Agua Fria River and additional tributaries for Wild and Scenic River eligibility are similar to those in *Alternatives A and B.*

The Black Mesa ACEC would restrict travel on routes traveling directly to or through cultural sites. The Tule Creek ACEC would have impacts similar to *Alternative A.* The Vulture Mountains ACEC would have the effect of preventing any new vehicle routes from being

constructed. Also, existing routes could be closed if they conflict with raptor habitat. The Harquahala Mountains ONA ACEC would retain most of the existing routes while preventing any new vehicle routes from being constructed. Impacts to the route network for development of a long distance trail system would be small. The Black Butte ACEC would have a minimal effect on travel and transportation since routes inside the ACEC boundary are little traveled. Travel in Jackrabbit wash would likely be closed as result of the route evaluation process described in Appendix D. This would be noteworthy for some users in the area as this sandy wash route is used by OHV and ATVs as a through travel route.

The five designated wilderness areas within the Bradshaw-Harquahala Planning Area and the Harquahala Mountain Summit Backcountry Byway would have impacts similar to those described under *Alternative A.*

Alternative D

Impacts in the Agua Fria National Monument would be similar to *Alternative B*, except 47 miles, or 27.8 percent of routes would remain open to vehicular travel. The route system under *Alternative D* would not add new routes. Opportunities for motorized recreation would be limited, and loop trails would not be developed. The route system would close 122 miles of existing routes and could greatly diminish opportunities for motorized recreation and public access in some areas. The Bloody Basin Road Backcountry Byway would not be established and current conditions would be maintained.

Designation of the Agua Fria River Riparian Corridor ACEC within the monument would have impacts similar to the Wild and Scenic River eligibility study and suitability determination as described in *Alternative C*.

The model route system for *Alternative D* would close 412 miles of routes in ACECs within the Bradshaw-Harquahala Planning Area. The quality and quantity of motorized recreational experiences and opportunities would diminish significantly by imposing potential restrictions in ACECs. These ACEC route closures would diminish opportunities for traditional motorized users, and lead to the disruption and disconnection of multiple routes in the travel network. These impacts are described in detail below.

Designation of the Black Mesa ACEC would have effects similar to ones described in *Alternative C.* The Tule Creek ACEC would have similar effects as described in *Alternative B*. The Baldy Mountain ONA ACEC would have the effect of closing all routes within the ONA boundary, resulting in the vehicle route closures. The Sheep Mountain RNA ACEC would have the effect of closing all the vehicle routes within the boundary, but all inventoried routes are in a reclaiming state. New vehicle routes would be prohibited, but would be of little effect since land ownership around Sheep Mountain is private or State land. The Vulture Mountains ACEC would have similar effect to impacts described in *Alternative C* with the exception that an additional 3,320 acres would be encompassed by the ACEC. The Belmont-Big Horn Mountains ACEC would have effect of prohibiting any new vehicle routes, thus limiting the ability of BLM and user groups from planning and installing a vehicle-based long distance route network. The Harquahala Mountains ACEC would have similar impacts as those described in *Alternative C* except the ACEC encompasses an additional 10,780acres. Additional route closures could potentially be implemented in this area if ACEC resources are impaired by motorized vehicle travel.

The five designated wilderness areas within the Bradshaw-Harquahala Planning Area and the Harquahala Mountain Backcountry Byway would have impacts as described under *Alternative A.*

Nominating the Black Canyon Trail as National Recreation Trail would have a positive impact to non-motorized trail users. Motorized and non-motorized users will be separated along many parts of the trail. This separation will improve

the experience of both motorized and non-motorized trail users in the Black Canyon Trail area.

***Alternative E* (Preferred Alternative)**

The designated route and motorized travel network within the AFNM would be reduced 41 percent under this Alternative. About 100 miles or route would remain open and 70 miles of vehicular routes would be closed (see Map 2-57). Monument lands would remain closed and unavailable for cross-country motorized travel. The route system under *Alternative E* would add only 1 mile of new route. There would be a noticeable loss of motorized touring, driving and vehicle-based activities. Travel networks, loops, and connectivity would be disrupted or diminished in some areas. Designating and establishing the Bloody Basin Road Backcountry Byway would have impacts similar to those presented under *Alternative B.*

Under the model route system for the Bradshaw-Harquahala Planning Area 114 miles of vehicle routes within ACECs would be closed. Most ACEC closures would occur in the lands allocated to the Harquahala Mountain ONA and the Black Butte ONA. Other closures would be done within the Tule Creek ACEC and the Vulture Peak ACEC. Impacts of route closures in ACECs would be similar to those described in *Alternative C.*

Nominating the Black Canyon Trail as National Recreation Trail would have similar impacts as those described in *Alternative D.*

The five designated wilderness areas within the Bradshaw-Harquahala Planning Area and the Harquahala Mountain Backcountry Byway would have similar impacts as those described in *Alternative A.*

4.20.2 From Lands and Realty Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

The new, expanded lands and realty authorizations would gradually and potentially expand the route and travel network. This will happen over the life of the plan as new rights of ways for private and State land access, and installation of new utilities, continues. These lands and realty actions and associated route construction would increase the motorized route network less than 1 percent annually over the life of the plan. These actions would directly and indirectly increase route connectivity and links with other route networks for motorized recreationists. On the other hand, subsequent development of these State and private lands could lead to the disruption or loss of public access across these non-Federal lands. Historically, much of the public access to BLM-lands has been through private and State lands available for motorized and non-motorized user access to public lands. Development of State and private lands usually results in the loss or restriction of this traditional access.

4.20.3 From Management of Soil, Air, and Water Resources

***Alternative A* (No Action)**

Vehicle route and OHV area closures on BLM-administered lands, required for protecting, mitigating damage; or adverse effects to soil, water and air resources, could diminish the motorized route network over the life of the plan. Especially near private property, residential and commercial land developments and State lands. Moreover, these actions would occur on a case-by-case basis as complaints are filed or problems identified.

County, State and private owners will apply existing law or legal measures to curtail damage to their property from the effects of damaged BLM-administered soil, air and water resources. Examples of potential resources issues affecting private and State lands include fugitive dust and PM_{10} emissions from public roads and OHV travel, soil erosion from hill climbs and cross country OHV travel; and changes in water

courses or water quality due to OHV travel and the public use of non-engineered or poorly engineered travel routes. Route and area closures would impact the amount of motorized recreation activity and could diminish the overall route network's linkage and connectivity to other travel route systems.

***Alternatives B, C, D* and *E* (Preferred Alternative)**

Impacts on Transportation and Access management from localized case-by-case responses to soil, air and water damage or complaints would be the same as described under *Alternative A.*

On most public lands under all action Alternatives, BLM would take direct action during and upon designation of the Travel and Access network to lessen, eliminate or avoid impacts on both public and private soil, water and air resources. The designation of travel and access networks, the application of dust suppression technology, the rerouting and specific closure of problem routes, the application of buffer zones, the application of SRMA prescriptions, and improving the engineering of the existing and new routes would reduce impacts to soil, water and air resources. Potentially, the existing route networks would be slightly reduced over time in order to protect air, water and soil resources; however, this reduction would not be significant except under *Alternative D. Alternative D* would close routes and route networks within sizeable areas of the Hieroglyphic Mountains SRMA and associated locales.

4.20.4 From Biological Resource Management

***Alternative A* (No Action)**

There are no impacts expected.

Alternative B

Management for biological resources would reduce transportation routes and public access more than under *Alternative A.*

Areas designated as ACECs would contribute to a decline or loss in travel and transportation access opportunities but would increase the preservation of biological resources. ACECs and their resulting impacts on transportation are discussed in section 4.20.1.

In the Bradshaw-Harquahala Planning Area 64,220 acres would be managed as wildlife habitat. Managing a WHA would limit transportation access and vehicle routes that interfere with the preservation of the wildlife habitat. This limitation on access could shift transportation to other areas and concentrate vehicle usage on routes that remain open.

Alternative C

This Alternative would provide more management of biological resources than *Alternatives A* or *B*. As a result, management of biological resources under *Alternative C* would have a greater impact on transportation and public access by restricting more area to motorized transportation.

Impacts of WHAs would be the same as *Alternative B except* that *Alternative C* would provide management of more WHAs than *Alternative B*. The 157,180 acres in the Bradshaw Harquahala Planning Area would be managed as WHAs. In the monument, 39,330 acres would be managed as WHAs, reducing access more than previous Alternatives.

Alternative D

This Alternative would close the most area to motorized access due to biological resource management and ACEC designation.

Impacts of managing WHAs would be the same as *Alternative C* except that in the Bradshaw Harquahala Planning Area 18,020 acres would be managed as WHAs.

***Alternative E* (Preferred Alternative)**

Management of biological resources under this Alternative would restrict less motorized access than *Alternative D*, but more than *Alternative C.*

Impacts of managing WHAs would be the same as *Alternative C* except that in the Bradshaw Harquahala Planning Area 140,310 acres would be managed as WHAs.

4.20.5 From Cultural Resource Management

***Alternative A* (No Action)**

Cultural resource management would have little impact on the existing Transportation and Access network. A few specific vehicle travel routes could be closed in the Agua Fria National Monument and within the Bradshaw-Harquahala Planning Area to protect cultural sites or mitigate existing resource damage, but the extent of such closures would have little overall impact on motorized recreation opportunities and the current state of route connectivity.

Alternative B

Vehicle travel networks could be adversely influenced in some areas of the Agua Fria National Monument and the Bradshaw-Harquahala Planning Area as some routes would be closed (as discussed in section 4.20.1) for cultural site protection. Route connectivity could be diminished and the quality of vehicle-based recreation pursuits would decline in the involved areas as the closures are implemented.

Alternative C

Other than limitations on routes from the Black Mesa ACEC described previously, management for Cultural Resources would reduce route availability if conflicts were determined.

Alternative D

Impacts would be similar to those described in *Alternative C.*

***Alternative E* (Preferred Alternative)**

Impacts on the Transportation network and public access would be similar to those described under *Alternative B*. The potential closing of routes in the planning areas as protective measures for cultural sites would diminish or displace motorized recreation activities in affected areas and possibly reduce the connectivity of the involved route networks. Opportunities for access to some cultural sites would be reduced or eliminated for motorized users, especially in parts of the Agua Fria National Monument, the Black Mesa/Bumble Bee Cultural Resource Priority Area, and the Black Canyon Corridor, the Lake Pleasant/Agua Fria, Wickenburg/Vulture, Weaver/Octave, Harquahala and Galena Gulch SCRMAs.

4.20.6 From Paleontological Resource Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

There are no impacts expected because no paleontological sites are known to exist in the planning areas.

4.20.7 From Recreation Resource Management

***Alternative A* (No Action)**

The Agua Fria National Monument is closed to cross-country motorized travel to protect monument resources; however, most existing routes would remain open. Closing OHV routes or activity areas to protect resources could limit motorized-recreation opportunities and experiences in some areas, especially along the wild and scenic river suitability corridor.

In the Bradshaw-Harquahala Planning Area, nearly 100 percent of the 2,240 miles of vehicle

routes would remain open. Existing types of motorized and vehicle-based recreation opportunities would continue unchanged. In the Vulture Mountains, Belmont Mountains, Big Horn Mountains, Harquahala Mountains, and Harcuvar Mountains; route networks and route mileage would increase over the long-term from current levels as there is no limitation or prohibition of motorized cross-country travel. These new route networks and route miles would also expand into presently unroaded areas over the same time period.

Alternative B

As in *Alternative A*, most routes would remain open to vehicular travel in Agua Fria National Monument.

The proposed route system, developed though an interdisciplinary evaluation process would enhance recreational opportunities for motorized users by creating loop trails, which would allow connected touring, provide for greater access, and offer more extended and dispersed recreational opportunities. Developing connecting route networks for hikers, bicycles, OHVs, and equestrians would affect recreation opportunities because all types of users could enjoy activities consistently, in more areas, and with fewer user conflicts. Recreation opportunities and general access for motorized users would be improved by the development of about 5 miles of new routes needed to bypass private property and maintain route system connectivity. The proposed route system would close 38 miles of existing routes and could diminish opportunities for motorized recreation in some areas. Users of these routes would be displaced to other areas within and outside the monument.

Under the model route system for the Bradshaw-Harquahala Planning Area, up to 48 miles would be closed in designated ACECs. In the remainder of the planning area, about 98 percent of existing routes would remain open.

A total of 168 miles of routes within both planning areas would be closed elsewhere to (1) protect resources, (2) reduce redundancy, and (3) limit routes for administrative use. The closures represent 7.4 percent of the routes in the planning area. Current motorized users would be displaced to other State and public lands. Up to 14 miles of new routes would be established to mitigate losses from the closures and to achieve better route connectivity. The total distance of open routes would eventually reach 2,100 miles. The overall effect of route management under *Alternative B* would be to maintain the existing recreation settings and opportunities and avoid greatly changing or diminishing motorized recreation opportunities and public access throughout the Bradshaw-Harquahala Planning Area.

Limiting all mechanized vehicles to inventoried routes before completing the route designation process (i.e. within 5 years of plan approval) would eliminate cross-country OHV travel throughout the planning area. According to the AGFD Off-Highway Vehicle Strategic Plan (AGFD 1998), cross-country travel accounts for five percent of activities. Accordingly, this limitation would not affect most OHV users. Restricting all motorized and non-motorized *vehicles to existing routes would not affect current activities or public access, but would prevent developing new routes to expand the recreational experience.*

Alternative C

In Agua Fria National Monument, 129 miles, or 69.7 percent, of routes would remain open to vehicular travel. The route system developed under *Alternative C* would create loop trails for motorized touring and add new routes to bypass private property. About 6 miles of new routes would be developed and would affect motorized recreation opportunities and public access by maintaining route connectivity in the event of private land closures.

The impacts on opportunities for motorized recreation in the Bradshaw-Harquahala Planning Area would be similar to those under *Alternative B*, but the model route system for *Alternative C* would close 382 miles of routes (mainly in

ACECs and lands allocated to maintain or enhance wilderness characteristics). In the rest of the planning area, 1,889 miles of routes would remain open, and 382 miles of potential closures would be mitigated by up to 26 miles of new routes. The total distance of open routes would be 1,915 miles or 15 percent less than the existing routes and 9 percent less than in *Alternative B.*

The impacts on opportunities for motorized recreation in the Bradshaw-Harquahala Planning Area would be similar to those under *Alternative B,* but the total distance of open routes would be 1,915 miles or 15 percent less than the existing routes under *Alternative A* and 9 less than in *Alternative B*. As a result, traditional users could be displaced and recreation opportunities diminished.

Alternative D

In Agua Fria National Monument, 47 miles, or 27.8 percent, of routes would remain open to vehicular travel. The route system under *Alternative D* was developed mainly for resource protection and would not add new routes. Opportunities for motorized recreation would be limited or foregone, as loop trails would not be developed. The route system would close 101 miles of existing routes and this action would displace or eliminate opportunities for motorized recreation and public access to some areas.

The impacts of route designations on the Transportation and Public Access network within the Bradshaw-Harquahala Planning Area would be similar to those under *Alternative B*, except *Alternative D* would close 412 miles of routes in ACECs and lands allocated to maintain or enhance wilderness characteristics. The motorized recreational experience and opportunities of vehicle users would be lessened or eliminated in some areas by enacting specific route, wash, or area closures. Route closures would diminish or displace opportunities for traditional users, and route and area closures could result in the disconnection of multiple routes in the network. Some motorized use and public access would be foregone all together.

In the rest of the planning area 1,645 miles of routes would remain open, and 723 miles of potential closures would be mitigated by developing 62 miles of new routes. The total distance of open routes would be 1,706 miles, representing a loss of 24 percent of the existing routes.

***Alternative E* (Preferred Alternative)**

The route network within the Agua Fria National Monument under the preferred Alternative would retain 101 miles of existing route and construct 1 mile of new route to enhance connectivity. About 70 miles of route would be closed. Impacts to recreation from the preferred route network would be similar to *Alternative C.*

A total of 211 miles of routes would be closed to protect resources, to reduce redundancy, and to limit routes for administrative use. Thirty-nine miles of new routes would be established to mitigate losses from the closures and to achieve better route connectivity. The total length of open routes would be 2,028 miles. The closures represent nine percent of the routes in the planning area. OHV management and route closures in ACECs and lands allocated to maintain or enhance wilderness characteristics to achieve recreation settings would somewhat reduce the amount of lands open to vehicle-based motorized recreation and public access. Most closures would occur in lands allocated to maintain or enhance wilderness characteristics in the vicinity of Black Butte, and within the Belmont Mountains and in the Harquahala Mountain and Black Butte ONAs.

Developing connecting route networks and public access for hikers, bicycles, OHVs, and equestrians would benefit recreational opportunities because all types of users could enjoy activities consistently, in more areas, and with fewer interruptions. Once completed, the Black Canyon Trail from the Carefree Highway to north of Highway 69 would become a major trail of regional significance for mountain

bikers, equestrians, and hikers. Moreover, the trail would link the communities of the Black Canyon corridor and the north boundary of the Phoenix-Peoria metropolis.

Limiting and reducing current levels of motorized access on 216,900 acres in nine areas would impede the ability of motorized recreational users to access and travel some secondary and tertiary routes, washes, and single-track cattle paths in these areas.

Managing the North Black Canyon Trail RMZ would enhance the non-motorized recreation access by assuring long-term access to the trail as well as connections to public land to the south and Forest Service land to the north and east.

Impacts of limiting all mechanized vehicles to inventoried routes before completion of the route designation process would be similar to *Alternative B.*

4.20.8 From Visual Resource Management

***Alternative A* (No Action)**

Visual resource management would have no effect on the current Transportation and Public Access network. New motorized and non-motorized routes would be developed on a case-by-case basis and could probably be developed across most of the Bradshaw-Harquahala planning area. VRM would have little effect on the AFNM, as the proclamation already significantly restricts development of new travel routes incompatible with monument objects.

***Alternatives B, C, D* and *E* (Preferred Alternative)**

Designation of VRM I and II classes across assorted landscape allocations and areas within the Bradshaw-Harquahala Planning Area could restrict or modify the construction of new travel routes or the realignment of existing travel routes if such routes were inconsistent with VRM management objectives. Management would be strict in designated wilderness with Class I VRM designation and with few major motorized travel routes authorized. Non-motorized travel routes would be easier to install due to their smaller scope and effect.

Some travel routes could be developed in ACECs with Class I and II VRM designations, but could be considerably restricted in ONAs with recognized scenic values and landscapes. Installation of new travel routes within Class III and IV VRM class areas would usually be consistent with visual management objectives for these areas, and enable the development of reasonable levels of Transportation and Public Access to and through such areas.

4.20.9 From Rangeland Management

***Alternatives A (No Action), B, C, D,* and *E* (Preferred Alternative)**

Rangeland Management would have little to no effect on the Transportation and Public Access network under any Alternative. Installation of new rangeland developments might slightly increase motorized public access if the routes are made available for public use. On the other hand, the closure or abandonment of rangeland developments could eventually contribute to the loss of public access, as livestock facilities are removed and access routes reclaimed. Vandalism to livestock facilities from public land visitors could potentially lead to the closure of public access routes. Over the long term, closure of travel routes in order to avoid conflicts or protect facilities from vandalism could have the greatest influence on reducing public access

4.20.10 From Minerals Management

***Alternative A* (No Action)**

Mining operations would have no impact on wilderness characteristics within the Agua Fria National Monument as mining is not allowed and the area is closed to mineral entry, mineral sales, and leasing. Wilderness characteristics would probably decline, be impaired, or be foregone over the long-term on Bradshaw-Harquahala Planning Area lands allocated to less protective resource management. Wilderness characteristics could be impaired, decline, or be foregone within the Bradshaw-Harquahala Planning Area in areas not afforded protection of their wilderness characteristics. Over a period of 10 to 20 years, reasonable levels of mining, leasing and sale of mineral materials could adversely affect the wilderness characteristics of naturalness and opportunities for solitude and primitive and unconfined recreation experiences. Without specific management actions in place to maintain and enhance areas with wilderness characteristics, degradation of those characteristics could occur from mineral management actions. In more remote and non-mineralized areas, wilderness characteristics would probably remain unchanged over the life of the plan.

Alternatives B* and *C

Closing the allocation to maintain or enhance wilderness characteristics to mineral material disposal would reduce the potential area for ground disturbance and maintain primitive open space. Long-term impacts on scenery and landscapes would be kept away from areas with wilderness characteristic.

Alternative D

Lands allocated to maintain or enhance wilderness characteristics would be closed to mineral sales, geothermal leasing and mineral entry. There would be little to no impact on wilderness characteristics from future mineral exploration and development as such actions would probably not occur. Natural and primitive conditions would be maintained over the long-term.

***Alternative E* (Preferred Alternative)**

Closing the allocation to maintain or enhance wilderness characteristics to mineral material disposal and sales would reduce the potential for landscapes to be marred by mining and exploration activities. Natural areas and open space would be maintained and conserved.

4.20.11 From Fire Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

No impacts on wilderness characteristics are likely from fire management and suppression operations on public lands within the Agua Fria National Monument and the Bradshaw-Harquahala Planning area.

4.20.12 From Wild Horse and Burro Management

***Alternatives A* (No Action), *B, C, D* and *E* (Preferred Alternative)**

Wilderness characteristics will not be affected by management of wild burro populations or herd areas within the Bradshaw-Harquahala Planning area. There are no wild burro populations within the Agua Fria National Monument, consequently there are no effects.

4.20.13 From Management of Transportation and Public Access

***Alternative A* (No Action)**

No areas are allocated for maintaining or enhancing the management of wilderness characteristics under this Alternative. No impacts on wilderness characteristics would be anticipated within the Agua Fria National Monument. Wilderness characteristics could be impaired, decline, or be foregone on up to 107,510 acres within the Bradshaw-Harquahala Planning Area. Over a period of 20 years, reasonable levels of road and route development, access rights-of-way and other developments requiring roads, along with a general expansion of motorized route systems, could adversely affect the wilderness characteristics of naturalness and opportunities for solitude and primitive and unconfined recreation experiences. In more remote areas, wilderness characteristics might remain unchanged over the life of the plan due to an absence or travel and transportation activities.

Alternative B

The impacts of existing or new travel and transportation activities on lands allocated to maintain or enhance wilderness characteristics would be minimal. Travel and transportation plans and affiliated roads, routes and trails would be compatible to the wilderness character allocation. Development of new non-motorized trails and routes could enhance primitive recreation activities. Wilderness characteristics could be impaired, decline or be foregone due to travel and transportation activities on lands not allocated to maintain or enhance wilderness characteristics, as described under *Alternative A*. These potentially adverse impacts on wilderness characteristics would be of a lesser scale than described under *Alternative A*.

Alternative C

Impacts are similar to those described under *Alternative B* for lands allocated and not allocated to maintain or enhance wilderness characteristics. Potentially adverse impacts on wilderness characteristics; however, would be of a lesser degree than described under *Alternatives A* or *B*.

Alternative D

Impacts are similar to those described under *Alternative B* for lands allocated and not allocated to maintain or enhance wilderness characteristics. Potentially adverse impacts on wilderness characteristics would be considerably less than estimated under *Alternatives A, B* or *C*.

***Alternative E* (Preferred Alternative)**

Impacts are similar to those described under *Alternative C* for lands allocated and not allocated to maintain or enhance wilderness characteristics. The magnitude of impacts on wilderness characteristics would be comparable to the environmental effects described under *Alternative C*.

4.20.14 From Management of Wilderness Characteristics

***Alternative A* (No Action)**

No areas are specifically managed to maintain or enhance wilderness characteristics in the Agua Fria National Monument. However, primitive or semi-primitive non-motorized settings would likely be maintained due to the management guidelines set forth in the monument proclamation (Appendix A), by limiting development of new vehicle routes and roads, and by employing interim protective management prescriptions for suitable WSR segments along the Agua Fria River. For that reason, few adverse impacts to wilderness characteristics are anticipated. There is a lack of short and long-term management actions in the

monument that would directly impact wilderness characteristics.

Wilderness characteristics could be impaired, decline, or be foregone on up to 107,510 acres within the Bradshaw-Harquahala Planning Area. Over a period of 10 to 20 years, reasonable levels of resource use and development, and expansion of motorized route systems, could adversely affect the wilderness characteristics of naturalness and opportunities for solitude and primitive and unconfined recreation experiences. Without specific management actions in place to maintain and enhance areas with wilderness characteristics, degradation of those characteristics could occur from motorized vehicle activities, grazing developments, lands and realty actions, utility development and mining. In more remote areas, wilderness characteristics might remain unchanged over the life of the plan due to a lack of motorized access.

Alternative B

Impacts in the Agua Fria National Monument would be the same as under *Alternative A*, with the exception those wilderness characteristics would by and large be maintained in the monument's backcountry management zones. In the Bradshaw-Harquahala Planning Area, wilderness characteristics would be maintained on 65,120 acres. Non-motorized and natural conditions free of human influences would be conserved. Existing opportunities for solitude and primitive and unconfined recreation experiences would be maintained or enhanced. Overall, the allocation of wilderness characteristics would reduce the access of motorized users. On the other hand, non-motorized visitor uses would increase in these areas as hikers, campers, hunters and sightseers are attracted to protected and non-motorized locales. These non-motorized individuals would be able to recreate in a more natural and remote setting.

Wilderness characteristics would probably be maintained or enhanced over the long-term for lands allocated as proposed WSR suitable segments, ACECs and ONA ACECs. Wilderness characteristics would probably decline, be impaired or be foregone over the long term on lands allocated to less protective resource management. Wilderness characteristics could be impaired, decline or be foregone on over 42,000 acres within the Bradshaw-Harquahala Planning Area in areas not afforded protection of their wilderness characteristics. Over a period of 10 to 20 years, reasonable levels of resource use and development, and expansion of motorized route systems, could adversely affect the wilderness characteristics of naturalness and opportunities for solitude and primitive and unconfined recreation experiences. Without specific management actions in place to maintain and enhance areas with wilderness characteristics, degradation of those characteristics could occur from motorized vehicle activities, grazing developments, lands and realty actions and mining. In more remote areas, wilderness characteristics would probably remain unchanged over the life of the plan due to a lack of access coupled with effective OHV route designations, increased OHV education and signing, and strict OHV law enforcement practices.

Alternative C

Impacts would be similar to *Alternative B*, except 107,510 acres of land would be managed to maintain or enhance wilderness characteristics. Non-motorized users would benefit more than under *Alternative B* as additional lands are allocated to maintaining or enhancing wilderness characteristics. Loss of wilderness characteristics would be minimal under *Alternative C*.

Alternative D

Impacts would be similar to *Alternative C*, except 91,480 acres would be managed to maintain or enhance wilderness characteristics. This Alternative would designate some of the areas described under *Alternatives B* and *C* as ONA ACECs. Wilderness characteristics would also be afforded long-term protection in those

ONA ACECs through the application of protective prescriptions. Impacts on special area designations are described in section 4.21.1. Wilderness values present in over could be degraded or lost about 16,000 acres, and more thoroughly described under *Alternative A*.

***Alternative E* (Preferred Alternative)**

Impacts would be similar to *Alternative B*, except 96,420 acres would be managed to maintain or enhance wilderness characteristics. Non-motorized users would benefit more than under *Alternative B*, but less than under *Alternatives C* and *D*. Wilderness values could be degraded or lost on about 11,000 acres as more comprehensively described under *Alternative A*.

4.21 Impacts on Wilderness Characteristics

4.21.1 From Special Area Designations

***Alternative A* (No Action)**

There would be minimal impacts on wilderness characteristics under this Alternative in the Agua Fria National Monument. Wilderness characteristics would probably be maintained over the long term for lands allocated as proposed Agua Fria River WSR suitable segments. The wilderness characteristics on 9,660 acres within the Larry Canyon and Perry Mesa ACECs would remain unchanged. In the remainder of the monument, few adverse impacts to wilderness character are anticipated. No identified short and long-term management actions are anticipated that would directly impact wilderness characteristics. Special Area Designations would have no effect on wilderness characteristics within the Bradshaw-Harquahala Planning Area.

Alternative B

The absence of the Larry Canyon and Perry Mesa ACECs would little affect wilderness characteristics as both areas are protected within the Aqua Fria National Monument. No identified short and long-term monument management actions that directly or indirectly impact wilderness characteristics are anticipated. Special Area Designations would have no effect on wilderness characteristics within the Bradshaw-Harquahala Planning Area.

Alternative C

No areas would be specifically managed to maintain or enhance wilderness characteristics in the Agua Fria National Monument. Wilderness characteristics would probably be maintained over the long term for lands allocated as proposed Agua Fria River WSR suitable segments. Wilderness characteristics on 460 acres encompassed by the Larry Canyon, Indian Creek, and Lousy Canyon ACECs would be conserved. Elsewhere, no short and long-term monument management actions are anticipated that would directly or indirectly impact wilderness characteristics. Wilderness characteristics extant within the Black Butte Raptor and the Harquahala Mountain ACECs/ONAs would remain relatively unchanged from current circumstances. Other Special Management Designations would not affect identified wilderness characteristics.

Alternative D

No areas would be specifically managed to maintain or enhance wilderness characteristics in the Agua Fria National Monument. Wilderness characteristics would probably be maintained over the long term for lands allocated as proposed Agua Fria River WSR suitable segments. Wilderness characteristics within the 13,070 acre Agua Fria Riparian Corridor ACEC, an ACEC overlapping the proposed Agua Fria River suitable segments, would also be maintained over the long-term. Elsewhere, no short and long-term monument management actions are anticipated that would directly or

indirectly impact wilderness characteristics. Wilderness characteristics within the Baldy Mountain ONA, the Belmont-Big Horn Mountains ACEC, the Black Butte Raptor ACEC, and the Harquahala Mountains ONA would remain relatively unchanged from current conditions and in all probability would be conserved over the long-term. Other Special Management Designations would not affect identified wilderness characteristics.

Alternative E **(Preferred Alternative)**

There would be minimal impacts on wilderness characteristics within the Agua Fria National Monument, since no areas are specifically managed to maintain or enhance wilderness characteristics. Wilderness characteristics would almost certainly be maintained over the long term for lands allocated as proposed suitable segments of the Agua Fria River WSR proposal. In other parts of the monument with identified wilderness character, no short and long-term management actions are anticipated that would directly or indirectly impact wilderness characteristics. Within the Bradshaw-Harquahala Planning Area, wilderness characteristics within the 104,690 acres comprising the Black Butte Raptor and the Harquahala Mountains ACECs/ONAs would remain relatively unchanged from current conditions and be conserved over the long-term. Other Special Management Designations would not affect identified wilderness characteristics.

4.21.2 From Lands and Realty Management

Alternative A **(No Action)**

Lands and Realty management actions would have no effect on wilderness characteristics under *Alternative A*. No areas are identified to specifically manage, maintain, or enhance wilderness characteristics.

Alternative B

Lands and Realty management actions could have a minor effect on wilderness characteristics within the Harquahala Mountain range under *Alternative B*. Under this Alternative 56,040 acres would be allocated to managing or enhancing wilderness characteristics. Providing rights-of-way for access to State lands, utility lines, or communication sites might impact the natural conditions and solitude opportunities within the area. Overall, such impacts would be considered minor since new lands and realty actions must be consistent with VRM objectives and desired future conditions. It is likely that some discretionary lands and realty actions, deemed incompatible with maintaining or enhancing wilderness characteristics, would not be allowed. In view of that, disallowed lands and realty actions would have no effect on wilderness characteristics.

Alternative C

Impacts are the same as described under *Alternative B*, with the exception that five areas totaling 107,510 acres are under consideration for managing or enhancing wilderness characteristics.

Alternative D

Impacts are the same as described under *Alternative B*, with the exception that seven landscape areas totaling 91,480 acres are to be allocated for managing or enhancing wilderness characteristics.

Alternative E **(Preferred Alternative)**

Impacts on Wilderness Characteristics from Lands and Realty Actions are similar to those described under *Alternative B*, with the exception that 96,420 acres are allocated for managing or enhancing wilderness characteristics.

4.21.3 From Management of Soil, Air, and Water Resources

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

Management actions undertaken to protect or conserve water and soil resources, or satisfy air quality standards, would, in turn, indirectly maintain wilderness characteristics and providing healthy open space areas near communities, offer a more natural-appearing landscape, and improve primitive recreation experiences for visitors by reducing human intrusions.

4.21.4 From Biological Resource Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

Habitat improvement actions could have a minor effect on areas encompassing wilderness characteristics. Installation of habitat improvements might impact naturalness and impair existing opportunities for solitude and primitive and unconfined recreation. Such outcomes, however, would be considered minor since new biological resource management actions would be consistent with VRM objectives and desired future conditions for lands with wilderness characteristics.

4.21.5 From Cultural Resource Management

***Alternative A* (No Action)**

There are no impacts expected from current cultural resource management or related management actions.

***Alternatives B, C, D,* and *E* (Preferred Alternative)**

Lands with wilderness characteristics could benefit from potential route closures prescribed to protect cultural sites, primarily sites located in or next to lands allocated to maintain or enhance wilderness characteristics. The lands with wilderness characteristics could benefit from reductions in motorized public access, by affording increased opportunities for solitude, and offering expanded non-motorized recreation settings, all direct consequences of route closures. Limiting group size to 25 visitors at some cultural sites could reduce overcrowding and maintain a more natural experience. Development of sites for public use would allow concentrations of users in certain areas. Limiting development in other areas would preserve the natural setting of places with wilderness characteristics.

4.21.6 From Paleontological Resource Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

There are no impacts expected because no paleontological sites are known to exist in the planning areas.

4.21.7 From Recreation Resource Management

***Alternative A* (No Action)**

Increasing use and intensity of recreation next to lands allocated to maintain or enhance wilderness characteristics could result in a loss of some of those characteristics. This effect would be most pronounced on the fringes of areas with wilderness characteristics. The solitude and quality of primitive recreation experiences could decline for some users.

Additionally, potentially growing numbers of non-motorized users could impair solitude

opportunities and contribute to trailing and campsite use impacts along the edge, as well as the interior, of these wilderness characteristics areas. No SRMAs or RMZs would be allocated. As a result, intensive recreation uses would not be directed to areas suitable or compatible for such use. Visitor use would be primarily self-directed and not allocated to appropriate use areas. Both intensive and disperse recreation uses could cause the impairment or loss of wilderness characteristics along the periphery of the wilderness character areas. It is likely that recreation settings would gradually shift over time to more motorized settings and opportunities.

Current management would result in SRPs being issued upon request in both planning areas. Permit requests are expected to grow as the population grows, which could lead to increased numbers of users and conflicts between them; further deteriorating opportunities to experience solitude and wilderness characteristics.

Alternative B

Designating Front Country and Back Country RMZs within the Agua Fria National Monument could benefit wilderness characteristics through management of more intensive recreation uses. Opportunities for solitude would be enhanced in the Back Country RMZ because vehicle intrusions and visitor use numbers would in all probability be constrained.

The restriction of motorized access on lands allocated to maintain or enhance wilderness characteristics in the Bradshaw-Harquahala Planning Area could benefit non-motorized users by allowing them to recreate in a more natural setting. This would assure the availability of these areas for offering outstanding primitive recreational and solitude opportunities.

The reduction in lands available for competitive OHV events and competitive races could help maintain high-quality opportunities to experience more natural settings over the long-term. Establishing criteria to manage larger group activities would help protect wilderness values, enhancing opportunities for solitude. Therefore, permits for commercial and vending operations would be prohibited. The number of SRPs would be limited, though this limitation would still allow for a significant increase over current conditions.

Alternative C

Impacts would be similar to *Alternative B*, except that *Alternative C* proposes further restrictions on motorized use within the planning areas, a larger Back Country RMZ within the Agua Fria National Monument, and fewer SRPs overall. These management actions would offer more solitude opportunities and retain more wilderness characteristics for visitors seeking primitive and unconfined recreation.

Alternative D

Impacts would be similar to *Alternatives B* and *C*, except that *Alternative D* proposes further restrictions on motorized recreational use in the planning areas, more Back Country RMZ acreage within the Agua Fria National Monument, and fewer SRPs overall.

***Alternative E* (Preferred Alternative)**

Impacts would be similar to *Alternative B*, although motorized access would be somewhat reduced and restrictions on SRPs would more closely resemble *Alternative C*.

4.21.8 From Visual Resource Management

***Alternative A* (No Action)**

No VRM standards were applied in the Phoenix RMP (BLM 1988a) or the Lower Gila North MFP. As a result, VRM Class III standards would be applied throughout the planning area outside of designated wilderness (which would be VRM Class I). The application of VRM Class III may eventually lead to some intrusions in to the visual landscape in or around lands

allocated to maintain or enhance wilderness characteristics.

Alternative B

Management of lands allocated to maintain or enhance wilderness characteristics to VRM Class II would retain the current physical setting of 96,150 acres and enhance primitive recreational experiences. Improvements or developments in these areas would be required to meet design criteria to integrate the color, line, form, and texture of the facilities with the surrounding landscape. This would maintain the area with little to no visual impacts from proposed developments and maintain or enhance the landscape's natural appearance and open space values, while meeting other resource management objectives.

Alternative C

Impacts would be similar to *Alternative B*, except 134,920 acres of lands allocated to maintain or enhance wilderness characteristics would be managed to VRM Class II.

Alternative D

Impacts would be similar to *Alternative B*, except 226,400 acres of lands allocated to maintain or enhance wilderness characteristics would be managed to VRM Class I, which would require more stringent design criteria.

***Alternative E* (Preferred Alternative)**

Impacts would be similar to *Alternative B*, except that 55,480 acres of lands allocated to maintain or enhance wilderness characteristics would be managed to VRM Class II.

4.21.9 From Rangeland Management

***Alternative A* (No Action)**

Wilderness characteristics would not be greatly influenced by rangeland management operations practiced within the Bradshaw-Harquahala Planning area or the Agua Fria National Monument. Site specific water projects, fencing, or vegetation projects may impact small areas and associated local recreational users. Any proposed rangeland projects will, however, be developed and installed consistent with the desired future conditions for the project area's biological conditions, recreation settings, and visual resources. Accordingly, potential visual resource impacts will be mitigated and consistent with the management and enhancement of wilderness characteristics.

Alternative B

Impacts on Wilderness Characteristics from Rangeland Management actions would be similar to those presented under *Alternative A*.

Alternative C

Impacts on Wilderness Characteristics from Rangeland Management actions would be similar to those presented under *Alternative A*.

Alternative D

There would be no cattle grazing on public lands under *Alternative D*. Thus, there would be no potential impacts on wilderness characteristics accruing from rangeland management practices.

***Alternative E* (Preferred Alternative)**

Impacts would be the same as presented for *Alternative A*.

4.21.10 From Minerals Management

***Alternative A* (No Action)**

Mining operations would have no impact on wilderness characteristics within the Agua Fria National Monument as mining is not allowed

and the area is closed to mineral entry, mineral sales, and leasing. Wilderness characteristics would probably decline, be impaired, or be foregone over the long-term on Bradshaw-Harquahala Planning Area lands allocated to less protective resource management. Wilderness characteristics could be impaired, decline, or be foregone within the Bradshaw-Harquahala Planning Area in areas not afforded protection of their wilderness characteristics. Over a period of 10 to 20 years, reasonable levels of mining, leasing and sale of mineral materials could adversely affect the wilderness characteristics of naturalness and opportunities for solitude and primitive and unconfined recreation experiences. Without specific management actions in place to maintain and enhance areas with wilderness characteristics, degradation of those characteristics could occur from mineral management actions. In more remote and non-mineralized areas, wilderness characteristics would probably remain unchanged over the life of the plan.

Alternatives B* and *C

Closing the allocation to maintain or enhance wilderness characteristics to mineral material disposal would reduce the potential area for ground disturbance and maintain primitive open space. Long-term impacts on scenery and landscapes would be kept away from areas with wilderness characteristic.

Alternative D

Lands allocated to maintain or enhance wilderness characteristics would be closed to mineral sales, geothermal leasing and mineral entry. There would be little to no impact on wilderness characteristics from future mineral exploration and development as such actions would probably not occur. Natural and primitive conditions would be maintained over the long-term.

***Alternative E* (Preferred Alternative)**

Closing the allocation to maintain or enhance wilderness characteristics to mineral material disposal and sales would reduce the potential for landscapes to be marred by mining and exploration activities. Natural areas and open space would be maintained and conserved.

4.21.11 From Fire Management

***Alternatives A* (No Action), *B, C, D,* and *E* (Preferred Alternative)**

No impacts on wilderness characteristics are likely from fire management and suppression operations on public lands within the Agua Fria National Monument and the Bradshaw-Harquahala Planning area.

4.21.12 From Wild Horse and Burro Management

***Alternatives A* (No Action), *B, C, D* and *E* (Preferred Alternative)**

Wilderness characteristics will not be affected by management of wild burro populations or herd areas within the Bradshaw-Harquahala Planning area. There are no wild burro populations within the Agua Fria National Monument, consequently there are no effects.

4.21.13 From Management of Transportation and Public Access

***Alternative A* (No Action)**

No areas are allocated for maintaining or enhancing the management of wilderness characteristics under this Alternative. No impacts on wilderness characteristics would be anticipated within the Agua Fria National Monument. Wilderness characteristics could be impaired, decline, or be foregone on up to 107,510 acres within the Bradshaw-Harquahala Planning Area. Over a period of 20 years, reasonable levels of road and route development,

access rights-of-way and other developments requiring roads, along with a general expansion of motorized route systems, could adversely affect the wilderness characteristics of naturalness and opportunities for solitude and primitive and unconfined recreation experiences. In more remote areas, wilderness characteristics might remain unchanged over the life of the plan due to an absence or travel and transportation activities.

Alternative B

The impacts of existing or new travel and transportation activities on lands allocated to maintain or enhance wilderness characteristics would be minimal. Travel and transportation plans and affiliated roads, routes and trails would be compatible to the wilderness character allocation. Development of new non-motorized trails and routes could enhance primitive recreation activities. Wilderness characteristics could be impaired, decline or be foregone due to travel and transportation activities on lands not allocated to maintain or enhance wilderness characteristics, as described under *Alternative A.* These potentially adverse impacts on wilderness characteristics would be of a lesser scale than described under *Alternative A.*

Alternative C

Impacts are similar to those described under *Alternative B* for lands allocated and not allocated to maintain or enhance wilderness characteristics. Potentially adverse impacts on wilderness characteristics; however, would be of a lesser degree than described under *Alternatives A* or *B.*

Alternative D

Impacts are similar to those described under *Alternative B* for lands allocated and not allocated to maintain or enhance wilderness characteristics. Potentially adverse impacts on wilderness characteristics would be considerably less than estimated under *Alternatives A, B* or *C.*

***Alternative E* (Preferred Alternative)**

Impacts are similar to those described under *Alternative C* for lands allocated and not allocated to maintain or enhance wilderness characteristics. The magnitude of impacts on wilderness characteristics would be comparable to the environmental effects described under *Alternative C.*

4.21.14 From Management of Wilderness Characteristics

***Alternative A* (No Action)**

No areas are specifically managed to maintain or enhance wilderness characteristics in the Agua Fria National Monument. However, primitive or semi-primitive non-motorized settings would likely be maintained due to the management guidelines set forth in the monument proclamation (Appendix A), by limiting development of new vehicle routes and roads, and by employing interim protective management prescriptions for suitable WSR segments along the Agua Fria River. For that reason, few adverse impacts to wilderness characteristics are anticipated. There is a lack of short and long-term management actions in the monument that would directly impact wilderness characteristics.

Wilderness characteristics could be impaired, decline, or be foregone on up to 107,510 acres within the Bradshaw-Harquahala Planning Area. Over a period of 10 to 20 years, reasonable levels of resource use and development, and expansion of motorized route systems, could adversely affect the wilderness characteristics of naturalness and opportunities for solitude and primitive and unconfined recreation experiences. Without specific management actions in place to maintain and enhance areas with wilderness characteristics, degradation of those characteristics could occur from motorized vehicle activities, grazing developments, lands and realty actions, utility development and mining. In more remote areas, wilderness characteristics might remain

unchanged over the life of the plan due to a lack of motorized access.

Alternative B

Impacts in the Agua Fria National Monument would be the same as under *Alternative A*, with the exception those wilderness characteristics would by and large be maintained in the monument's backcountry management zones. In the Bradshaw-Harquahala Planning Area, wilderness characteristics would be maintained on 65,120 acres. Non-motorized and natural conditions free of human influences would be conserved. Existing opportunities for solitude and primitive and unconfined recreation experiences would be maintained or enhanced. Overall, the allocation of wilderness characteristics would reduce the access of motorized users. On the other hand, non-motorized visitor uses would increase in these areas as hikers, campers, hunters and sightseers are attracted to protected and non-motorized locales. These non-motorized individuals would be able to recreate in a more natural and remote setting.

Wilderness characteristics would probably be maintained or enhanced over the long-term for lands allocated as proposed WSR suitable segments, ACECs and ONA ACECs. Wilderness characteristics would probably decline, be impaired or be foregone over the long term on lands allocated to less protective resource management. Wilderness characteristics could be impaired, decline or be foregone on over 42,000 acres within the Bradshaw-Harquahala Planning Area in areas not afforded protection of their wilderness characteristics. Over a period of 10 to 20 years, reasonable levels of resource use and development, and expansion of motorized route systems, could adversely affect the wilderness characteristics of naturalness and opportunities for solitude and primitive and unconfined recreation experiences. Without specific management actions in place to maintain and enhance areas with wilderness characteristics, degradation of those characteristics could occur from motorized vehicle activities, grazing developments, lands and realty actions and mining. In more remote areas, wilderness characteristics would probably remain unchanged over the life of the plan due to a lack of access coupled with effective OHV route designations, increased OHV education and signing, and strict OHV law enforcement practices.

Alternative C

Impacts would be similar to *Alternative B*, except 107,510 acres of land would be managed to maintain or enhance wilderness characteristics. Non-motorized users would benefit more than under *Alternative B* as additional lands are allocated to maintaining or enhancing wilderness characteristics. Loss of wilderness characteristics would be minimal under *Alternative C*.

Alternative D

Impacts would be similar to *Alternative C*, except 91,480 acres would be managed to maintain or enhance wilderness characteristics. This Alternative would designate some of the areas described under *Alternatives B* and *C* as ONA ACECs. Wilderness characteristics would also be afforded long-term protection in those ONA ACECs through the application of protective prescriptions. Impacts on special area designations are described in section 4.21.1. Wilderness values present in over could be degraded or lost about 16,000 acres, and more thoroughly described under *Alternative A*.

***Alternative E* (Preferred Alternative)**

Impacts would be similar to *Alternative B*, except 96,420 acres would be managed to maintain or enhance wilderness characteristics. Non-motorized users would benefit more than under *Alternative B*, but less than under *Alternatives C* and *D*. Wilderness values could be degraded or lost on about 11,000 acres as more comprehensively described under *Alternative A*.

4.22 Impacts on Social and Economic Conditions

The management actions for the resources that are described for each of the Alternatives would result in both social and economic impacts to people and businesses in and next to the planning areas. In many instances social and economic effects considerably overlap. In general, the greatest effect would be economic, since in most cases the actions described for the Alternatives would not have major social effects in the planning area. The economic base profile completed for this analysis considers socio-economic impacts to be most critical in recreation, livestock grazing, minerals, and lands and corridors.

BLM has collaborated with the public and local communities in developing Alternatives and a number of management actions have been incorporated into the Alternatives to address public concerns. For this reason, substantial adverse social or economic impacts are not expected.

4.22.1 Planning Area Growth and Development

The analysis of social and economic impacts is partially based on land use modeling completed for BLM for the planning areas (Blueline Consulting Group 2004). The model uses one set of assumptions to determine which land would likely have residential growth between the years 2000 and 2025. While limited to one set of assumptions, four modeling analyses varied the vacant land base available to receive the growth according to the BLM's land disposition Alternatives. The detailed methodology, including assumptions, appears in Appendix M.

Growth in and next to the planning areas would continue to affect the resources on BLM's land. Much of the development is likely to occur on lands that the Arizona State Land Department (ASLD) might sell for private development. However, this analysis assumed (for purposes of this RMP) that no ASLD land in the planning areas would be developed. This assumption was made because the future legislative framework governing State land transactions is uncertain (including the potential for the exchange of land between the ASLD and the Federal Government).

According to Blueline Consulting Group GIS models, future development in 2005–2025 would occur on lands that are closer to BLM's lands, compared to the time period 1985–2005, when residential land was developed around and to the east of the Interstate 17 corridor. Both Maricopa and Yavapai Counties would experience continued rapid growth. A small portion of eastern La Paz County is included in the Bradshaw-Harquahala Planning Area, but that part of the county is relatively undeveloped and is expected to experience limited growth through 2025.

In Maricopa County a large proportion of development in the Bradshaw-Harquahala Planning Area would occur on both sides of U.S. Route 60, north and east of the White Tank Mountains, extending to State Route 74 on the north. In Yavapai County, a large proportion of development would be along State Route 69.

Yavapai County would grow at a more rapid rate (70 percent) than Maricopa County (54 percent) during the planning period but would add fewer persons (140,000) than Maricopa County (1,954,000) through 2025. Although Yavapai County has a large amount of land available for development, development on BLM's land to be disposed of under the Alternatives would occur on the lands that are nearer to Yavapai County's current population centers (as described for the growth projection model prepared for this analysis).

Under *Alternatives A, B*, and *C*, BLM would dispose of large tracts of land, which would be available for development. Each of these tracts

of BLM's land is next to large tracts of State land, which this analysis assumed would not be developed. Analysis of land disposal also assumed the following:

- the land would be disposed of within the life of the plan,
- the land would be developed mainly for residential use, and
- other uses such as commercial and light industrial development could also occur.

Population changes could result from increased or decreased economic activity and from changes in amenity values, including mining, ranching, and recreational opportunities, which might increase employment in the managed areas. The changes in population, if any, would have the most impact on the smaller unincorporated places in the planning area, such as Salome-Wenden, Dewey-Humboldt-Mayer, and Black Canyon City.

Potential effects from growth and development might be seen in the loss of ranching and the related western lifestyle. Potential effects might occur in:

- the change in social leadership structure resulting from increases in urban values and
- reduced ranching resulting from changes in allowable grazing.

This effect could be viewed as both social and economic.

The most likely economic effects from management would result from the following:

- changes in recreation visitation levels in both planning areas,
- mining in the Bradshaw-Harquahala Planning Area, and
- ranching activities near communities.

***Alternative A* (No Action)**

Recreation-Related Impacts

Recreation visitation levels are expected to increase from any action that enhances the quality of recreation experiences or creates more facilities or improved access. Increased visitation would be reflected in greater expenditures for goods and services in the local and regional economies. Greater expenditures, in turn, would tend to encourage added business activity and population growth. Growth in business would, in turn, stimulate construction.

Designating Agua Fria National Monument will most likely result in some increased visitor use to the monument and to surrounding areas, particularly given the monument's closeness to the Phoenix metropolitan area. This effect might also increase demand for use of BLM's land next to and near the monument as activities that might be less available in the monument place greater demands on surrounding BLM's lands.

In general, use of BLM's land in the planning areas for a variety of purposes would continue to increase as the population of Maricopa and Yavapai Counties, and Arizona as a whole, continues to increase. This analysis assumes that 70 percent of visitors to the planning areas would come from these counties and that this percentage would remain constant throughout the life of the plan. Additionally, visitation to the planning areas is expected to increase by the rate of the population growth in these counties, which is 55 percent by 2025 (Andereck and others 2002).

In addition to a continued overall increased interest in recreation, growth would also economically affect local communities. A continuation of current access and availability of trails for a variety of recreational purposes would yield continued economic benefit to the communities that provide services compatible with recreation. These services include eating and drinking places, OHV sales and repair businesses, horse boarding and tack businesses, campgrounds, and RV parks. These businesses are part of the services and trade industries, which in earnings and employment continue to be two of the dominant industries in the

planning areas. Continued support of growth trends for these sectors of the economy would benefit communities such as Black Canyon City, the Salome/Wenden area, Prescott, Wickenburg, and Cordes Junction.

OHV use is a significant form of recreation on BLM's lands, as discussed in section 3.15.5. Access for these users would continue to impact the OHV industry, especially in Yavapai and Maricopa Counties. OHV recreation currently accounts for more than $2 billion per year in economic impact in these counties.

Continued use of BLM's lands by equestrian users would also benefit local economies that cater to this group, as discussed in section 3.15.5. For example, the impact from the horse industry on the broader Wickenburg area economy is about $14 million (Beattie and others 2001).

In the long term, as recreation continues to increase through a variety of uses in the planning areas, resource conditions could deteriorate to some extent. As a result, the need for management of the area to monitor and protect the resources would increase.

Ranching, Agriculture, and Livestock Production-Related Impacts

Farming and ranching have historically been significant contributors to the Arizona economy. In recent years, extensive increases in population and urbanization in and near the planning areas have resulted in loss of agricultural land and increased conflicts with farm and ranch operations.

Livestock production resulting from grazing leases on BLM's land is an economic contributor to the local economy in the planning areas. The planning areas have 104 allotments with 932,907 acres of BLM's land that would continue to be open to grazing under current management. About 8,100 cattle, 2,470 sheep, 75 goats, and 87 horses are now grazing on BLM's allotments.

Changes in allowable grazing could affect ranchers in the planning areas. The magnitude of this effect is related to the economic viability and scale of existing ranches. An in-depth study of local ranching economics was not a part of the planning process. Because census data aggregates employment data for ranching with that for all agriculture, forestry, and fisheries, effects to this sector cannot be analyzed using employment data.

However, factors such as livestock production on BLM's land can be evaluated. The following impacts were based on this evaluation. Prohibiting grazing in the Larry Canyon ACEC (which is currently inaccessible to cattle) and in areas suitable or eligible for Wild and Scenic River areas in Agua Fria National Monument has minimal impact on livestock production. The number of livestock in the remainder of the planning areas would remain unchanged. Therefore, under current management the economic impacts of livestock production would not change.

Minerals-Related Impacts

A “RFD scenario,” as required by BLM's Instruction Memorandum 2004-089, has been prepared to describe potential mineral resource development. This scenario forecasts the type of mineral development that might reasonably occur under No Action. It also provides a means of evaluating the impacts of management actions under the other Alternatives.

Actions that increase mining would tend to stimulate the local and regional economies through (1) increased employment and (2) increased demand for goods and services for the mine itself. The duration of this effect would depend upon the size of the mineral deposits and market demand for the products. Conversely, actions that either eliminate or discourage mining; or preclude new mining would tend to decrease, or at least not increase local and regional activity.

Agua Fria National Monument is closed to all forms of mineral entry. Minerals development

in the Bradshaw-Harquahala Planning Area involves mainly saleable materials.

Locatable Minerals

In this Alternative, the Bradshaw-Harquahala Planning Area would generally be left open to mineral location and development. BLM would continue to administer mining of locatable minerals on a case-by-case basis. Unless otherwise allocated, scattered lands and other Federal minerals outside the planning area are open to mineral location and development. Should prices of locatable minerals reach a level that makes it feasible to begin exploration or reopen mines in this area, there would be a positive economic impact in mining employment and earnings. The extent of that impact would not be known until the scope of the activity is determined in the future.

A social element has emerged in the last few years associated with the recreational aspects of prospecting for gold. Numerous prospecting clubs have formed with thousands of members dedicated to weekend casual exploration for gold. These clubs hold many mining claims within the planning area and have regular club events dedicated to finding nuggets of gold and having fun. Though the contribution to local economies from these clubs and events are relatively small, businesses have begun to cater to their needs and support their social structures. Continuation of motorized access in this Alternative will allow continued use by these groups, and the possibility of expansion to new areas.

Saleable Minerals

Continued public sales of mineral materials in the Bradshaw-Harquahala Planning Area on a case-by-case basis would have some economic impact. Unless otherwise allocated, scattered lands and other Federal minerals outside the planning area are open to mineral material disposal on a case-by-case basis, with determinations based on consistency with BLM's management policies and objectives. Generally, BLM sells saleable minerals at market prices. BLM would continue to issue free use permits to the State and to local communities as the need arises. The result would be the continued availability of materials that are in demand for construction throughout Arizona, and particularly in the Phoenix metropolitan area.

Private sales for landscape or decorative rock are expected from within the Bradshaw-Harquahala Planning Area. Sources of comparable sand and gravel are also available on private land throughout the planning area. Many of the private land sources are closer to markets than the BLM's sources. Therefore, the impact of mineral material sales is expected to be slight. The No-Action Alternative would not affect saleable mineral extraction and the use of these commodities.

Leasable Minerals

There are no known viable sources of leasable minerals in the Bradshaw-Harquahala Planning Area; however, all land in the area is now open to mineral leasing, except surface occupancy for oil/gas development is prohibited under current management in riparian areas of the Bumble Bee and Williams Mesa MRMAs, and the Hassayampa River RMA. This analysis assumes that over the 20-year term of the RMP up to two holes would be drilled for producing commercial amounts of gas and oil. Since the planning area has limited identified opportunities for mineral leasing, no measurable economic impacts are expected to result from exploration or development of leasable minerals except for potential areas that might be explored north of the planning area but within the PFO's boundary.

Should exploration or development of leasable resources be pursued, the economic impact of the production of new wells for oil and gas would be determined once the scale of the operation could be more specifically established. Special stipulations would be incorporated into the lease agreement after the results of site-specific environmental assessments for each action are known.

Economic benefits would be seen from the production of new wells, which could potentially result in jobs and revenue for the area in which the wells are drilled.

Lands and Corridors-Related Impacts

Under current management nearly 54,370 acres would be available for disposal.

Until a disposal or exchange occurs, social or economic impacts of the action cannot be easily determined. Generally, increased development on the lands proposed for development would affect the rural lifestyle that many in the area moved there to enjoy. Increased traffic, the need for more public services such as roads and additional utilities, and a loss of rural lifestyle would likely result. Areas that typically have large lots and open spaces would likely be developed at higher densities. Potential increased development would provide added economic opportunities, including an increased tax base for the community and employment from new businesses. However, the disposition of BLM's land would not be a significant growth-inducing action since much of the planning area is growing rapidly and would continue to grow, independent of any BLM's land disposal actions in the future.

Based on the modeling conducted by Blueline Consulting Group, any land proposed for disposal along the Interstate 17 corridor in both Maricopa and Yavapai Counties would likely be developed into residential neighborhoods during the life of the plan. The residential development would lie next to or within 10 miles of Agua Fria National Monument and/or the management units along the interstate corridor. The areas that would be most affected by the land disposal and potential growth are the Dewey-Humboldt-Mayer area and the area south of Agua Fria National Monument near Black Canyon City.

Residents of these two areas are likely to intensively and frequently use nearby BLM's lands. For example, the demand for resources such as decorative rock would come from such areas and resources available near the Interstate 17 corridor are more likely to be used. However, until a known parcel is proposed for disposal or exchange, it is difficult to determine the specific social or economic impact of the action and possible subsequent development.

Continued growth and development, along with opportunities for locating future infrastructure needed for this development, would be supported by retaining the multi-use utility and transportation corridor that includes the Interstate 17 right-of-way and other utility lines. The corridor also includes the eight multiple-use corridors along existing rights-of-way designated in the *Lower Gila North Management Framework Plan* (BLM 1983).

Opportunities to provide ample corridors would support the region's increased growth. The availability of corridors would present the opportunity for construction jobs should transmission lines, pipelines, or other facilities be built in the corridors. These jobs might benefit smaller communities close to the proposed corridors.

Alternative B

Recreation-Related Impacts

Alternative B would offer and encourage developed and primitive recreation in both planning areas. Protecting biological and cultural resources would enhance the quality of the recreation experience and increase visitation. Increased access to cultural resource areas and developing of interpretive media would also increase public interest and visitation. More active management of visitation is intended to enhance the quality of the recreation experience and; therefore, is expected to increase visitation. Trail building and developing facilities for horses and pack animals are expected to increase demand. *Alternative B* would meet the needs of both motorized and non-motorized recreation and would tend to increase overall recreation demand more than the other Alternatives.

Route modeling for *Alternative B* found that this Alternative would designate 2,100 miles of routes. As under *Alternative A*, a continuation of current access and availability of trails for a variety of recreational purposes would economically benefit businesses that provide services compatible with recreation and support the services and trade industries of the economy.

Alternative B proposes eight SCRMAs and nine SRMAs which would increase visitor use in the planning area where they are allocated and developed for public use. This would further benefit businesses that serve visitors.

Alternative B proposes two areas where lands are allocated to maintain or enhance wilderness characteristics and one WHA. These areas are designed to protect the area's primitive nature and allow for more non-motorized types of recreation on a more limited basis, than more active types of uses allowed under SRMAs. Nonetheless, these areas are open to recreation use and would attract visitors to the area, again benefiting economic sectors that support recreation.

Communities such as Black Canyon City, the Salome/Wenden area, Prescott, Wickenburg, and Cordes Junction provide local services to recreationists and would continue to benefit under *Alternative B.*

Alternative B proposes Bloody Basin Road, in Agua Fria National Monument and Constellation Mine Road near Wickenburg as Back Country byways. These designations would have an effect on recreation and visitor uses similar to the designation of Agua Fria National Monument; identifying them as "special" and attracting a certain population for that reason.

Long term impacts of recreation use would be the same as those listed under *Alternative A.*

Ranching, Agriculture, and Livestock Production-Related Impacts

The number of allotments and livestock grazing on BLM's land under *Alternative B* would be the same as under *Alternative A.* Since grazing in riparian areas would be limited to winter (November 1 to March 1), grazing would likely decline but socio-economic impacts would not measurably differ from current management. Impacts from allocating eight SCRMAs cannot be determined until the areas are defined and specific actions are selected. Should areas be restricted from grazing or fenced for protection, livestock production may decrease.

Minerals-Related Impacts

Management actions under *Alternative B* would be more encouraging to mineral exploration and mining than *Alternatives C, D,* or *E* for the Bradshaw-Harquahala Planning Area. Thus, *Alternative B* would tend to generate more mining and greater stimulate local and regional economies than would the other action Alternatives, assuming that mining does not conflict with recreational opportunities or visitation demand.

In the Bradshaw-Harquahala Planning Area, VRM standards would be established, with potential ramifications to mining. The increased cost of compliance with VRM standards might move the impacts from public lands to nearby State or private lands. Overall, the impact to local economies would be low and mining would be expected to remain at current levels.

The evaluation of proposed mining would consider mining's effect on biological and cultural resources. This Alternative is not expected to degrade the quality of the visitor's experience, to impact casual use miners, or prospecting club activities.

<u>Locatable Minerals</u>

Impacts would be similar to *Alternative A,* except the 640 acre Tule Creek ACEC would be closed to mineral location and development. As under *Alternative A,* an increase in prices of locatable minerals would possibly make it

feasible to begin exploration or to reopen mines in the planning area, economically benefiting mining employment and earnings. The extent of that impact would not be known until the scope of the activity is determined. These activities would most likely occur in the northern part of the planning area, affecting communities such as Wickenburg, Yarnell, and Black Canyon City.

The greatest impact to mining would potentially come from VRM. For locatable minerals, allowing mining is a nondiscretionary action outside of areas closed to mining. However, compliance with VRM standards would be imposed through rehabilitation standards. Higher costs of mine closure might be borne by mining companies, and in some cases the portion of bonds returned might be lower. Labor and material cost of increased rehabilitation could extend the economic benefits of mining to local communities if the labor and materials are purchased there.

Saleable Minerals

Impacts would be similar to *Alternative A,* except *Alternative B* would close to mineral material disposal Tule Creek ACEC and two areas allocated to maintain or enhance wilderness characteristics in the Bradshaw-Harquahala Planning Area. This would somewhat limit the potential sites for mining saleable minerals. However, since locations for this mining are unknown, the potential economic impact is also unknown but it is expected to be negligible.

Leasable Minerals

Impacts would be similar to *Alternative A*, except Tule Creek ACEC would be closed to mineral leasing. This would have a negligible impact since the planning area has limited identified opportunities for mineral leasing.

Lands and Corridors-Related Impacts

Impacts and assumptions of analysis would be similar to *Alternative A*, except that 58,400 acres would open to disposal. The 58,400 acres are scattered throughout the planning area and would mainly affect the communities of Dewey, Humboldt, Mayer, and Goodyear for future potential development.

Impacts of utility and transportation corridors would also be similar to *Alternative A*.

Alternative C

Recreation-Related Impacts

Alternative C would favor primitive over developed recreation in Agua Fria National Monument, where visitor access would be more limited than under *Alternatives A* or *B*. The number of commercial and guide/outfitter permits in the monument would possibly be half of those issued under *Alternative B*. Public access to cultural resources would also be more limited than under *Alternatives A* or *B*.

Public access in the Bradshaw-Harquahala Planning Area would be more restrictive than would the *Alternatives A* or *B*, and so would tend to reduce visitation and visitor spending. Biological and cultural resources would be better protected than under *Alternatives A* and *B*, thus somewhat raising the quality of the recreation experience. However, limiting visitor access would reduce the number of people able to enjoy the experience.

The number of SRMAs--which allow more active recreation--would increase visitor use and would benefit businesses that serve visitors. The planning area would be better protected for non-motorized uses by the following actions:

- reducing SCRMAs to four,
- increasing lands allocated to maintain or enhance wilderness characteristics, and
- applying restrictions that would result from designating 11 ACECs.

Overall the restrictions would reduce visitor use in the planning areas and economic benefits of

recreation and visitation would be lower than under *Alternatives A* or *B*, but greater than under *Alternative D*.

Alternative C would designate 1,915 miles of routes. Access and availability of trails for a variety of recreational purposes would result in continued economic benefits to the communities that provide services compatible with recreation. Communities such as Black Canyon City, the Salome/Wenden area, Prescott, Wickenburg, and Cordes Junction provide local services to recreationists and would continue to benefit.

Impacts of proposing Bloody Basin Road in Agua Fria National Monument and Constellation Mine Road near Wickenburg as Back Country byways would be similar to those described for *Alternative B*.

Long term impacts of recreation use would be the same as *Alternative A*.

Ranching, Agriculture, and Livestock Production-Related Impacts

Alternative C would prohibit grazing in riparian areas, reducing the number of allotments to 43, and allowing for more than 4,300 cattle to continue grazing on BLM's land. This would affect local areas and ranchers whose grazing allotments would be eliminated or reduced to the point that their businesses would no longer be viable. The difference between the impacts of *Alternatives A* and *C* on the regional economy would be minimal.

Minerals-Related Impacts

Mining would still be open in most areas but with substantial restrictions in lands allocated to maintain or enhance wilderness characteristics and ACECs. Impacts from this management action would be similar to *Alternative A*. Impacts would be less than *Alternative B* and greater than *Alternative D.*

Locatable Minerals

Impacts would be similar to *Alternative A* except for the closure to mineral location and development in three ACECs and riparian areas. As a result, there could be some economic limitations should suitable areas for mining be found where mining is prohibited.

Casual use miners and prospecting clubs could continue conducting their activities; however, route closures or limitations could make it more difficult, or potentially more expensive, if clubs are required to be responsible for maintaining access to their claims. Road work and reclamation bonds may be required.

Impacts from VRM would increase compared to those under *Alternative B,* but be less than impacts under *Alternative D*.

Saleable Minerals

Impacts would be similar to *Alternative A,* except ACECs and lands allocated to maintain or enhance wilderness characteristics in the Bradshaw-Harquahala Planning Area would be closed to mineral material disposal. As in *Alternative B*, this would somewhat limit the availability of potential sites for mining saleable minerals. Since locations for this mining are unknown, the potential economic impact is also unknown but expected to be negligible.

Leasable Minerals

Impacts would be similar to *Alternative A*, except mineral leasing would be prohibited in four ACECs in the Bradshaw-Harquahala Planning Area and on scattered lands outside the planning area. Since the planning area has a low potential for leasable mineral production, no measurable economic impacts are expected.

Lands and Corridors-Related Impacts

Alternative C considers two options for land disposal:

Under Option One, a total of 600 acres of land would be available for disposal. This analysis assumed that these acres would be developed for

residential use within the life of the plan. Since there is limited disposal or exchange under Option One, the impacts would be similar to those under *Alternative D* for land disposal.

Under Option Two, a total of 49,100 acres would be disposed of or exchanged. The lands are scattered throughout the planning area, mainly in the unincorporated areas of Yavapai and Maricopa Counties. A number of acres are located in the Yarnell area, which would provide a potential opportunity for low-density residential use if the lands were acquired for private purposes. Impacts would be similar to *Alternative A.*

Impacts of retaining the multi-use utility and transportation corridor that includes the Interstate 17 right-of-way would be similar to *Alternative A*, except that the corridor would be narrowed to move it out of Agua Fria National Monument. The opportunities provided by the corridors would continue to support increased growth in the region.

Alternative D

Recreation-Related Impacts

Alternative D is intended to put more emphasis on non-motorized recreation than the other Alternatives, by devoting the greatest area to non-motorized recreation and closing the most area to vehicular access. This Alternative would place stricter limitations on public access to cultural resources than any other. No motorized competitive races would be authorized. Visitation and OHV uses would decline in the planning area, resulting in somewhat lower visitor spending in the local and regional economies.

To the degree that this loss is not offset by an increase in non-motorized use, visitation for recreation would be lower than under the other Alternatives. The economic stimulus to the local and regional economies would also be lower. To the degree that the decline is offset by increased non-motorized recreation, the difference between the impacts of *Alternative D* and the other Alternatives would not be so great.

Alternative D would designate 1,707 miles of routes in the planning areas, the fewest miles under any of the Alternatives. Access to BLM's lands would continue to exist, and trails could be used for a variety of recreational purposes. However, trails would be more limited than under the other Alternatives. *Alternative D* could result in fewer economic benefits to the communities which provide services compatible with recreation.

The reduced number of SRMAs, which allow more active recreation, would affect visitor use and have a smaller impact on businesses that serve recreationists. *Alternative D* would create more protection for other non-motorized recreation uses in the planning area through the following actions:

- reducing the number of SCRMAs to two,
- increasing the number of areas allocated to maintain or enhance wilderness characteristics to six, and
- restricting access by designating eight ACECs.

Overall, these measures would reduce visitor use in the planning area.

Communities such as Black Canyon City, the Salome/Wenden area, Prescott, Wickenburg, and Cordes Junction provide local services to recreationists and would continue to benefit. However, benefits could possibly be less than under *Alternative C.*

Ranching, Agriculture, and Livestock Production-Related Impacts

Alternative D would prohibit grazing on BLM's lands. This prohibition would significantly affect holders of grazing leases and local economies, reducing livestock production in the State. In 2002 a total of 36,000 head of cattle were raised in Maricopa and Yavapai Counties. A reduction of 8,000 head would reduce

livestock production in the two counties by 20 percent.

Minerals-Related Impacts

Alternative D, with its emphasis on natural landscapes and primitive recreation opportunities, would be the most restrictive to mining. Both exploration and development would be strictly limited. This Alternative would tend to more or less eliminate mining via attrition over the duration of the plan. It would also reduce mining-related additions to the local and regional economies. No one knows whether this effect on local and regional economies would be offset by additions caused by visitation.

Locatable Minerals

Impacts would be similar to *Alternative C*, except that the areas closed to mineral location and development would be the greatest under this Alternative. As a result, economic opportunity would be limited to a greater extent than under other Alternatives, especially if suitable sites were identified for areas where no mining would be allowed.

Impacts from VRM would increase under this Alternative as compared with *Alternative B* because more acreage would be classified as VRM I and II.

Saleable Minerals

Impacts would be similar to *Alternative C,* except the closure to mineral material disposal of a number of ACECs and lands allocated to maintain or enhance wilderness characteristics would limit the availability of potential sites for mining saleable minerals more than any of the other Alternatives. However, locations for this mining are unknown, so the potential economic impact is also unknown. It is estimated that short term demand would continue to be met with production on both Federal and non-Federal lands. As the population continues to grow and demand increases, future demand may not be met and increased costs of importing building material will result in increased building costs in all parts of the economy.

Leasable Minerals

Impacts would be similar to *Alternative A*, except mineral leasing would be prohibited in a number of ACECs and lands allocated to maintain or enhance wilderness characteristics. Since the planning area has a low potential for leasable mineral production, measurable economic impacts are not expected.

Lands and Corridors-Related Impacts

Under *Alternative D*, no BLM land would be available for disposal. As stated previously, the disposition of BLM's land would not be a significant growth-inducing action, and so *Alternative D* would have no measurable impacts.

The unavailability of land as a result of no disposal does present a potentially positive social impact on the planning area, in that it would contribute to preserving the current rural lifestyle throughout much of the planning area.

The proposed reduction in the level of corridors under *Alternative D* would support continued economic development and growth in the region. *Alternative D* would somewhat constrain the citing of potential utilities in the corridors in the future, but their allocated corridors should be sufficient to meet local demand.

***Alternative E* (Preferred Alternative)**

Recreation-Related Impacts

Alternative E would favor primitive recreation opportunities over developed opportunities in the Agua Fria National Monument. Visitor access would be more limited than under *Alternatives A, B*, or *C*. However, visitor services and opportunities for structured or developed recreation would be greater than under *Alternative D.* The RMP would not set the number of commercial permits and

guide/outfitter permits in the monument. This number would be determined by monitoring resource conditions. Users could thus determine the limits for SRPs because resource conditions depend on social behaviors. If visitors use existing disturbances and take care not to expand them or degrade the quality of the surroundings, the capacity to support SRPs of many kinds would be higher than if visitors are inconsiderate of the land.

Public access to cultural resources in the Agua Fria National Monument area would also be more limited than under *Alternatives A, B,* and *C* because more routes would be closed; nevertheless, more routes would be designated as open than under *Alternative D*. Visitation is expected to shift from people desiring a motorized experience to people desiring a non-motorized experience. This shift is expected to reduce total visitation to the monument and result in somewhat lower visitation-related spending in the local and regional economies.

Public access would be restricted in the Bradshaw-Harquahala Planning Area more than *Alternative B, but less than Alternatives C* and D. Visitation and visitor spending are likely to be lower for this Alternative than for *Alternatives A* and *B*, but higher than for *Alternatives C* and *D*. The effect of this restriction would be most pronounced in the Harquahala MU, where most ACECs and lands allocated to maintain or enhance wilderness characteristics are located, although this MU now receives relatively low visitation.

Vehicle routes that would be designated as open are expected to accommodate use at current levels. Increased opportunities for non-motorized experiences in natural primitive landscapes might increase overall visitation, but the types of new users attracted to the area are not expected to greatly increase visitor spending in the local and regional economies.

In the Bradshaw-Harquahala Planning Area outside of the Harquahala MU, *Alternative E* would be similar to *Alternative C*. Allocating SRMAs to develop facilities and manage more intensive recreation, especially for motorized uses, would somewhat concentrate those activities. The improved facilities could attract more users to areas managed for more intensive recreation but might also cause people looking for a less-structured location to move to new areas. Overall, use is expected to increase where motorized users are managed and access is maintained. User satisfaction would also improve, along with opportunities for citizen stewardship. The Black Canyon, Castle Hot Springs, and Hassayampa MUs would experience most of the change resulting from these management actions. Overall, the economic benefits of recreation under *Alternative E* are expected to be lower than under *Alternatives A, B*, and *C*, but greater than under *Alternative D*.

Route modeling for the Preferred Alternative indicates 2,067 miles of route might be designated. The route network is expected to be similar to that modeled under *Alternative B*. A continuation of current access and availability of trails for a variety of recreational purposes would result in continued economic benefits to the communities that provide services compatible with recreation.

Under *Alternative E* six SCRMAs would contain sites allocated to public use, which would have impacts similar to *Alternative B*. The increase in areas allocated to maintain or enhance wilderness characteristics and the restrictions that would result from designating four ACECs would better protect the planning area for other non-motorized uses. These restrictions might reduce, or at least cap at current levels, visitor use in the vicinity of the allocations and designations.

Communities such as Black Canyon City, the Salome/Wenden area, Prescott, Wickenburg, and Cordes Junction provide local services to recreationists and would continue to benefit from recreation under *Alternative E*.

Consideration of Bloody Basin Road in Agua Fria National Monument and Constellation Mine

Road near Wickenburg for allocation as back Country byways would have impacts similar to those under *Alternative B.*

In the long term, as recreation continues to increase through a variety of uses in the planning area, resource conditions would deteriorate somewhat. Through the mix of (1) allocations to protect primitive landscapes and (2) development to manage and support motorized and other more intensive recreation, resource conditions are expected be maintained at current levels and to be sustainable throughout the life of the plans.

Ranching, Agriculture, and Livestock Production-Related Impacts

Impacts would be similar to *Alternative B*, except six SCRMAs would be allocated, which might result in areas being fenced for protection. The number of allotments and livestock grazing on BLM's land would be the same as under *Alternative A*. Since grazing in riparian areas would be limited to winter (November 1 to March 1), livestock production would likely decline but would not measurably differ from current management. Effects are expected to be negligible.

Minerals-Related Impacts

Management actions under Alternative E would be similar to those described for *Alternative A*, except that in the Bradshaw-Harquahala Planning Area the establishment of VRM standards would have impacts similar to those described for *Alternative B*. Overall, the impact to local economies would be low.

Impacts to casual miners and prospecting clubs are expected to be similar to *Alternative B*.

Locatable Minerals

Impacts would be similar to *Alternative B*, except that riparian areas in reconveyed lands, mainly in the Black Canyon area between Black Canyon City and Bumblebee, would be closed to mineral location and development along with Tule Creek ACEC.

Impacts to mining from VRM would be similar to *Alternative B,* except that fewer acres (11,830) would be allocated to VRM Class II and Class IV (7,930), and more acres (19,760) would be allocated to VRM Class III.

Impacts to casual miners and prospecting clubs are expected to be the same as for *Alternative B.*

Saleable Minerals

Impacts would be similar to *Alternative A,* except Tule Creek ACEC and riparian areas in the planning area would be closed to mineral material disposal, limiting slightly the potential sites for mining of saleable minerals. Data on the potential for this material show that this material is generally not in the areas that would be closed, so impacts are expected to be minimal.

As with locatable mining, VRM standards might affect mineral material and decorative rock mining. Permitting of saleable minerals is a discretionary action and the inability of a proposal to comply with VRM standards could be a reason to deny it. If VRM standards prove to be an unacceptable economic burden on the industry, demand is expected to be met from State or private sources. The environmental impacts (and revenues) would then shift off of public lands, but there would be no net change to the economies of local communities.

Leasable Minerals

Impacts would be the same as for *Alternative B.*

Lands and Corridors-Related Impacts

Impacts would be similar to *Alternative A*, except a total of 38,755 acres would be available for disposal by sale or exchange. The lands are scattered throughout the planning area and would mainly affect the future potential development of the communities of Buckeye,

Goodyear, Wickenburg, and the greater Phoenix area.

Impacts of utility and transportation corridors would be similar to *Alternative A*.

4.23 Environmental Justice

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority and Low-Income Populations," was issued in 1994. The objective of this order was to preclude Federal actions from creating disproportionate impacts to minority and low-income populations.

Table 4-9. Hispanic Populations within Human Resource Units

Hispanic Populations within Human Resource Units		
HRU/CRU	**% of Hispanics in Population**	**% Points Exceeding County % of Hispanics**
Yavapai County (10% Hispanic)		
Wickenburg HRU	11	1
Aguila CRU	16	6
Maricopa County (25% Hispanic)		
Phoenix HRU	27	2
Tolleson HRU	78	53
Buckeye HRU	26	1
Buckeye CRU	28	3
West Tonapah CRU	32	7
% People Living Below Federally Mandated Poverty Level		
HRU/CRU	**% Below Poverty Level in Population**	**% Points Exceeding County % Below Poverty Level**
Yavapai County (12% Below Federally Mandated Poverty Level)		
Wickenburg HRU	14	2
Aguila CRU	20	8
Yarnell CRU	16	4
Agua Fria CRU	15	3
Maricopa County (12% Below Federally Mandated Poverty Level)		
Phoenix HRU	13	1
Buckeye HRU	17	5

The relevant data needed to evaluate possible environmental justice effects (i.e. total and changes in minority populations and income levels) were presented in section 3.16. Table 4-9 shows HRUs and CRUs whose percentage of Hispanic populations and percentage of populations living below the federally mandated poverty level exceed those of their counties.

Analysis of the data presented in Chapter 3 did not find that implementing any of the proposed Alternatives would result in disproportionate adverse plan-related effects on minority or low-income groups. Nothing inherent in the proposed Alternatives would cause any statistically significant changes to ethnic composition of the resident populations. There is no indication that any of the Alternatives would have substantial adverse economic effects on any particular ethnic group or any particular income group as compared to others.

4.24 Cumulative Impacts

Cumulative impacts are the combination of the effects of past, present, and future foreseeable actions; in combination with the effects of each Alternative. With a large-scale regional plan such as this, many of the impacts discussed under each topical resource area are, in essence, cumulative impacts. Nevertheless, NEPA requires that the impacts occurring in the entire planning area be separately and specifically addressed.

The future foreseeable actions would include the following:

- population growth in and next to the planning area that would increase residential and commercial development on private lands in both Yavapai and Maricopa Counties,
- continued grazing,
- potential minerals development,
- increased recreational uses on BLM's lands,

- activities on lands under the jurisdiction of other Federal and State agencies.

The Alternatives could affect several resources and resource uses, including soils, air quality, water resources, and social and economic conditions.

Urbanization, mineral development, and increased outdoor recreational use of private and State lands in central Arizona are likely to continue throughout the life of the RMP. Cumulative impacts on wildlife might include the loss of wildlife habitat, including Sonoran desert tortoise and pronghorn antelope habitat; and migration corridors in the planning areas and on adjacent Federal, State, and private lands.

This section provides information relevant to the cumulative impacts for each Alternative, including a discussion about cumulative impacts as they relate to Population Growth and Development, Recreation/Visitation, Air Quality, Soils, Water Resources, and Wild Horse and Burro Management.

***Alternative A* (No Action)**

Population Growth and Development

As stated in section 4.22.1, potential cumulative effects of growth and development many include (1) the loss of ranching and the related western lifestyle and (2) change in social leadership structure resulting from increases in urban values and reduced ranching. In general, the greatest effects would be related to economics, since the actions proposed in the Alternatives would not, in most cases, have major social impacts in the planning areas.

Under current management 54,370 acres of BLM's land would be available for disposal by sale or exchange. The disposition of BLM's land is not expected to be a significant growth-inducing action, since much of the planning area is growing rapidly and would continue to grow independent of any BLM's land disposal in the future.

Therefore, *Alternative A* would have no measurable cumulative impact on growth and development in the State, growth in and next to the planning areas would continue to cumulatively impact resources on BLM's land.

Recreation/Visitation

The most likely cumulative effects would be related to changes in visitation levels in both planning areas. Cumulative impacts would include intensified use in certain areas, especially for motorized activities, as recreation increases and growth and development occur near recreation areas. General plans for the counties and area communities include provisions for open space, which is usually for parks or non-motorized recreation, further concentrating motorized activities on BLM's land.

Increased visitation is expected to result in increased spending for recreational goods and services. Communities such as Black Canyon City, the Salome/Wenden area, Prescott, Wickenburg, and Cordes Junction provide local services to recreationists and would continue to benefit from recreation under the current management.

Air Quality

The main air quality issue affecting the planning area is also related to forecast population growth in the planning area, especially the rapid growth in the Phoenix nonattainment areas. A secondary air quality issue is increased emissions from additional OHV use in the planning areas. A third cumulative impact issue is population increase in rural areas.

Cumulative air quality impacts in the planning areas have been adequately addressed by the air quality nonattainment plans and air quality maintenance plans that MAG and ADEQ have been required to prepare for approval by the EPA as described in section 3.4.2 Air Resources. These plans are required because the Phoenix area is already a nonattainment area for

several air pollutants and these plans are, in reality, quantitative cumulative air quality impact assessments.

Emissions from OHVs would likely begin to decrease in 2006 and might offset the expected future increase in OHV numbers (EPA 2003). In that case, increased OHV use would cause increased fugitive dust impacts immediately near the roads and trails on which they are driven and future cumulative OHV tailpipe emissions would probably contribute a proportionately smaller fraction of future regional air pollutant emissions.

Soils

The cumulative effects for soils would be generally limited to a particular site. Management practices in the planning areas and activities on private lands have led to some detrimental soil conditions, some of which persist. Additionally, as private lands continue to be rapidly developed, especially near the Phoenix metropolitan area, soil becomes compact and displaced. As a result, loss of vegetation and impacts to watershed conditions may occur. Soil productivity in these areas is lost for all practical purposes.

Water Resources

The cumulative effects for water resources would be similar under all Alternatives. Watersheds integrate the effects of all activities within their boundaries. Therefore, activities on private *and* public lands affect water resources. The impacts of development on soil cumulatively affect watershed conditions. As a result, many watercourses in central Arizona have been degraded by increased sediment load due to urbanization, livestock grazing, and recreation. Furthermore, leachate from mining has historically degraded water quality in the region. Under *Alternative A*, these activities would continue and so affect water resources.

Wild Horse and Burro Management

The Lake Pleasant HMA, containing 80,800 acres, and the Harquahala HA, containing 156,255 acres, are both entirely within the Bradshaw-Harquahala Planning Area.

The only source of cumulative affects would be the ability of horses and burros to move from one location to another in response to management actions or natural conditions.

The Taylor Grazing Act, WHBA, and FLPMA require the following:

- that wild horses and burros be managed in a multiple use context,
- that wild horses and burros be afforded equal allocation of available AUMs of forage on a per-animal basis,
- that the number of livestock present be consistent with grazing permit levels;
- that number of horses or burros present consistent with the AML; and
- that wildlife requirements be estimated.

The Arizona Standards for Rangeland Health and Guidelines for Grazing Administration establish cumulative effects considerations for the threshold of significance. The total utilization of a rangeland must create conditions that meet these standards. If combined wild horse, burrow and livestock grazing reduce rangeland condition below the standard levels, then cumulative effects have occurred. By definition, cumulative effects cannot occur where AUM allocations are proportional. Cumulative effects might occur on private, State, or other Federal lands where AUM allocations are not proportional, i.e., where horses and burros have not been part of the allocation formula. If horses and burros move onto these lands and add their grazing pressure to the existing levels, then the cumulative effect might result in a rangeland condition that is below standard.

Animal numbers are carefully managed in the Lake Pleasant HMA and the small herd sizes in the Harquahala HA make that herd unsustainable. In addition, gathered animals are generally moved out of the area. Therefore,

burro management is not expected to result in noticeable cumulative impacts.

Alternative B

Population Growth and Development

Growth and development in and next to the planning areas would continue to have a cumulative impact on the resources. BLM's resources would also be impacted in the same manner as under *Alterative A*, except that 58,400 acres of land would be available for disposal by sale or exchange.

Recreation/Visitation

Cumulative impacts from recreation and visitation would increase over those in *Alternative A*. *Alternative B* is expected to increase visitation more than under the other Alternatives because:

- Developed and primitive recreation opportunities would be available and encouraged in both planning areas.
- Increased access to cultural resources and developing interpretive media would increase public interest and visitation.
- More active visitor management would enhance the recreation experience.

Visitor use in the planning areas would also increase in response to:

- allocating more SRMAs,
- designating the Bloody Basin and Constellation Mine Roads as back country byways, and
- allocating more SCRMAs.

The trend toward non-motorized recreation in areas of urban development would be similar to that under *Alternative A*.

Air Quality

The cumulative impacts to air quality under *Alternative B* are expected to be similar to those under *Alternative A*. The impacts to air quality from construction and mineral exploration or development would continue at essentially the same magnitude as described for *Alternative A*, and would be similarly addressed by MAG in their air quality maintenance plans.

Recreation that would create OHV emissions and particulates generated in the rural areas would not vary significantly from those under *Alternative A*. *Alternative B* would reduce the miles of trails open to recreation by three percent from that under *Alternative A*. Areas open to OHV use and potential mining would be greater than under the other Alternatives, but the air quality impacts on the region would be minimal.

Soils

The cumulative effects to soils under *Alternative B* are expected to be similar those under *Alternative A*.

Water Resources

The cumulative effects to water resources under *Alternative B* are expected to be similar as those under *Alternative A*.

Wild Horse and Burro Management

Cumulative impacts would be similar to those described for *Alternative A*, except that burros in the Harquahala HA would not be a managed herd, and nuisance animals and burros harming sensitive habitats would be removed.

Alternative C

Population Growth and Development

Growth and development in and next to the planning areas would continue to have a cumulative impact on the resources on BLM resources in the same manner as under *Alterative A*, except that under *Alternative C* 49,100 acres of land would be available for disposal by sale or exchange instead of 54,370 acres.

Recreation/Visitation

Cumulative impacts of recreation and visitation would decrease under *Alternative C* as compared to *Alternatives A* and *B*. This Alternative would favor primitive recreation opportunities over developed opportunities, and visitor access for motorized activities would be more limited. Such restricted use is expected to reduce visitation because motorized use accounts for three of the five most popular activities in the planning area. This reduction; therefore, would somewhat lower visitation spending in the local and regional economies. Overall, the beneficial economic effects of recreation and visitation would be lower than under *Alternatives A* and *B*, but greater than under *Alternative D*.

Alternative C would better protect the planning areas for non-motorized used by:

- reducing the number of SCRMAs,
- increasing areas allocated to maintain or enhance wilderness characteristics , and
- imposing motorized access restrictions by designating 11 ACECs.

Air Quality

The cumulative impacts to air quality are expected to be similar to those under *Alternative A*.

Recreation that would generate OHV emissions and particulates in rural areas would not vary significantly from that under *Alternative A* and air quality impacts in the region would be minimal. *Alternative C* would reduce the miles of trails open to recreation as compared to *Alternatives A* and *B*. The area opened to potential mining would be less than *Alternative B*, but greater than under *Alternative D*.

Soils

The cumulative effects to soils are expected to be similar to those under *Alternative A*.

Water Resources

The cumulative effects to water resources are expected to be similar to those under *Alternative A*.

Wild Horse and Burro Management

Cumulative impacts would be the same as those for *Alternative B*.

Alternative D

Population Growth and Development

Under *Alternative D,* BLM would not dispose of any land. Because the disposition of BLM's land would not be a significant growth-inducing action, cumulative impacts would be the same as under *Alternative A*.

Recreation/Visitation

Impacts from recreation would be reduced the most under this Alternative. *Alternative D* would devote more area to non-motorized recreation and close more areas to vehicular access than would the other alternatives. The gradual phase-out of motorized uses in the Hieroglyphic Mountain and Bradshaw Foothills areas would change the general recreation setting to more non-motorized uses. Overall, the number of visitors to the planning area would be reduced, along with visitor spending.

The planning area would be better protected for non-motorized uses by the following actions:

- reducing the number of SRMAs and SCRMAs,
- increasing areas allocated to maintain or enhance wilderness characteristics, and
- restricting motorized access by designating eight ACECs.

Air Quality

The cumulative impacts to air quality are expected to be similar to those under *Alternative A*.

Recreation generating OHV emissions and particulates in rural areas would possibly be less than under *Alternative A*, given more restrictions on areas open to OHV use and competitive events. *Alternative D* would reduce the miles of trails open to recreation use from that under *Alternative A*, but the air quality impact on the region would be minimal.

Soils

The cumulative effects to soil are expected to be less than those under any other Alternative, given that recreation and mining would be more restricted and grazing would be prohibited.

Water Resources

The cumulative effects on water resources are expected to be less than those under any other Alternative, given that recreation and mining would be more restricted and grazing would be prohibited.

Wild Horse and Burro Management

Cumulative impacts would be the same as under *Alternative B.*

***Alternative E* (Preferred Alternative)**

Population Growth and Development

Growth and development in and next to the planning areas would continue to have a cumulative impact on BLM's resources in the same manner as under *Alternative A*, except that 38,755 acres would be available for disposal by sale or exchange.

Recreation/Visitation

Alternative E would favor primitive over developed recreation in the Agua Fria National Monument area. Visitor access would be more limited than under *Alternatives A*, *B*, and *C*, but visitor services and opportunities for structured or developed recreation would be greater than under *Alternative D*.

Alternative E would also restrict public access in the Bradshaw-Harquahala Planning Area more than *Alternative B,* but less than *Alternative C;* and would tend to reduce visitation. *Alternative E* would result in somewhat less visitor spending in the local and regional economies than *Alternatives A* and *B*, but more than *C* and *D*. The effect of the management actions might be offset over time by the shear growth in recreation demand from population growth in the region.

The planning area would be better protected for non-motorized uses by the following actions:

- reducing the number of SCRMAs,
- increasing areas allocated to maintain or enhance wilderness characteristics, and
- restricting motorized access by designating four ACECs.

Air Quality

The cumulative impacts to air quality under *Alternative E* are expected to be similar to those under *Alternative A.*

Recreation that would generate OHV emissions and particulates in rural areas would not vary significantly from that under *Alternative A*. The miles of trails open to recreation would decline from those under *Alternative A* and areas with routes open to OHV use would be similar to those under *Alternative B*. Areas open to mining would be similar to those under *Alternative A*. The air quality impact on the region would be minimal.

Soils

The cumulative effects to soils under are expected to be less than those under *Alternatives A* and *B* because motorized recreation would be more restricted and fewer acres would be available for disposal and eventual development. Impacts would be more than those under *Alternatives C* and *D.*

Water Resources

The cumulative effects to water resources are expected to be less than those under *Alternatives A* and *B* because motorized recreation would be more restricted and fewer acres would be available for disposal and eventual development. Impacts would be more than those under *Alternatives C* and *D.*

Wild Horse and Burro Management

Cumulative impacts would be the same as under *Alternative B.*