

CHAPTER III AFFECTED ENVIRONMENT



INTRODUCTION

Chapter III describes the resources that would be significantly affected by implementing the alternatives only in as much detail as needed to explain the effects of implementation. Where impacts would be slight or nonexistent, the descriptions are brief or omitted. More detailed descriptions of the Kingman Resource Area's resources are in the Management Situation Analysis, which can be reviewed at the Kingman Resource Area office.

MINERAL RESOURCES

Physiography

The Kingman Resource Area includes 2,428,405 acres of public surface and 2,045,625 acres of federal minerals. This area is in west-central Arizona, mostly within the Basin and Range physiographic province and parts of the Transition Zone and Colorado Plateau. It has widespread igneous and metamorphic mountain ranges generally separated by shallow alluvial basins and plains, with extensive faulting and folding.

Minerals and Mineral Potential

Mineral potential has been rated using the guidance in the Bureau 3031 Manual. A summary of the rating for all mineral resources is presented in Table 19. A description of the potential and certainty levels is given in Appendix 28. The data show the highest rating for a resource within the area but do not imply the resource has the potential for uniform occurrence throughout the resource area.



TABLE 19
Mineral Resources Potential Rating*

Mineral Resource	Level of Potential	Level of Certainty
Oil and Gas	Zero/unknown	B
Coal	No Potential	D
Geothermal	Low	C
Sodium	High	D
Potassium	High	C
Metallic Minerals	High	D
Uranium	Mod	D
Non-Metallic	High	D
Common Varieties	High	D

* For rating explanation see Appendix 28.

Source: Kingman Resource Area files.

Oil and Gas

No economic occurrences of oil or gas have been encountered in wells drilled in the planning area, but only 14 wells have been drilled. The first well was completed in 1957, while the last was completed in 1970. Most of the wells are shallow, and no wells have tested rocks below 6,000 feet. Four wells were drilled in the portion of the resource area lying in the Transition Zone in the Red Lake area. Hydrocarbon shows have not been reported from any of the wells drilled.

Ryder (1983) and Butler (1988) rated the oil and gas potential of the resource area as zero or unknown on the basis of widely distributed outcrops and extensive exposures of Precambrian gneiss, schist, granite and Tertiary volcanic rocks that extend over most of the planning area. If oil and gas accumulations occur, they would be in structural or stratigraphic traps. Because of the absence of deep sequences of Mesozoic and Paleozoic marine sediments and the lack of oil shows reported from area wells, the potential for oil and gas accumulations is considered low to zero.

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Sodium and Gypsum

Halite and gypsum deposits are known to exist in two locations within the planning area - Red Lake Playa, at the northern end of Hualapai Valley, and in Detrital Valley, northeast of the Black Mountains (see Map 29). The deposits are similar, both occurring at depths of 700 to 1,500 feet, and both contain several thousand vertical feet of evaporitic deposits, with a lateral extent of several miles on a north-northwest trending axis.

There has been considerable recent interest in development of the Red Lake deposit expressed by at least two companies, and one exploratory drillhole has been completed. It is assumed that, due to the depth of the deposits, recovery would be via solution mining, and the preliminary proposals seen so far include both solution mining and underground natural gas storage schemes.

Over 50 percent of the lands in these areas are federally owned and open to mineral entry. Since the potential exists for several similar operations in these two locations, each developmental proposal submitted must be analyzed with regard to cumulative environmental impacts.

Geothermal (areawide)

Evaluation of 33 thermal and nonthermal waters of the Kingman-Williams region has shown no evidence for the existence of large geothermal systems or high temperatures (greater than 150° C) (Hahman, 1978). The temperatures and volumes of each system might be suitable for local space heating/greenhouse applications. Larger volumes of water, if discovered, could supply industrial process water for low-temperature applications (less than 100° C). The potential for the use of the geothermal resource is considered low because of the remote locations of the thermal waters.

Coal

The Kingman Resource Area has no known coal occurrences.

Metallic And Nonmetallic Minerals

Mineral exploration and production dates back to the mid 1860s. Metals recovered include copper, gold, iron, lead, manganese, molybdenum, niobium, silver, tungsten, uranium and zinc. Nonmetallic commodities include fluorite, feldspar, lime, sand and gravel, salts, silica and stone. Other elements or commodities reported but never produced commercially include yttrium, bismuth, barite, lithium, arsenic, antimony and rare-earth elements.

Past production figures are among the highest in the state in manganese, copper, tungsten, silver and gold and show significant totals for lead, zinc and uranium. Appendix 30 summarizes the recorded production from the principal mining districts. Ten districts have recorded cumulative production up to or exceeding \$1 million before 1980 with the Oatman, Walapai, Eureka and Old Dick districts far exceeding this figure. But for the most part, these figures do not reflect the production from relatively recently discovered volcanic and gneiss-hosted precious metals deposits that have become the focus of exploration interest in the region.

Three major copper producers are operating: Cyprus Bagdad, Cyprus Mineral Park and Emerald Isle. The Portland Mine (gold) in the Black Mountains halted production in March 1989. Several leaching operations are reprocessing old mine tailings for gold recovery.

Salable Minerals

Three major intermontane valleys (Detrital, Sacramento and Big Sandy) are structural troughs formed by block faulting and tilting associated with basin and range tectonism 14 to 17 million years ago. These valleys were filled with silt, sand, gravel and conglomerate derived in part from erosional processes acting on the surrounding bedrock highlands.

In addition to the material resources of the three major basins, sand and gravel resources are found along pediments of the major mountain ranges. These materials are often thin and discontinuous and are confined to relatively narrow zones. These resources may serve as material for smaller short-term projects. From the known occurrence of gravel in these environments, these areas have high favorability for the occurrence of this resource (see Map 30).

The Kingman Resource Area has 14 mineral material sale sites for sand and gravel and decorative stone. The most significant use of sand and gravel has been for highway construction along highways 68 and 93.

As population centers continue to grow, so will the demand for mineral materials. Mineral materials sites will need to be designated in or around communities for both commercial and residential uses.

Leasable Minerals

Two leasable mineral resources have been explored: oil and gas and sodium.

Fourteen oil and gas exploration wells have been drilled since the first well was drilled in 1957, but none have found oil and gas. Disturbance associated with each well, including access, typically totals between five and ten acres. Assuming an average of eight acres disturbed per well, roughly 112 acres have been disturbed for oil and gas exploration.

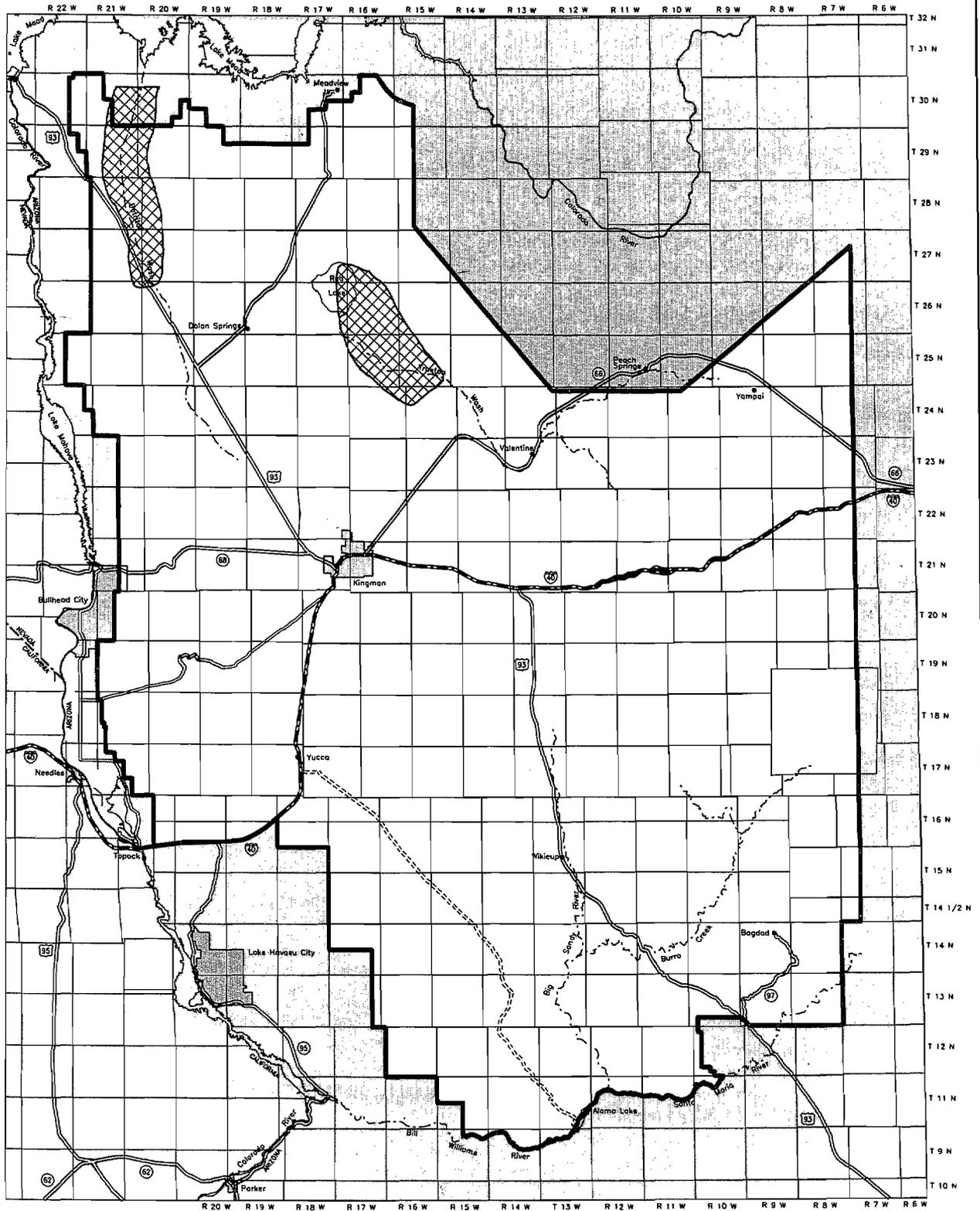
Typical well drilling operations may last as long as four months, though deep wells may take longer to drill. As no oil or gas has been produced from this area, all exploration disturbance has been reclaimed immediately after exploration. Complete reclamation of this disturbance may take from five to ten years.

Locatable Minerals

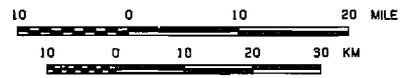
Locatable minerals are contained in a variety of geologic deposit types, including porphyry copper, epithermal precious metals, flat-fault gold, polymetallic veins, hot springs gold and volcanic and gneiss-hosted systems. Metals recovered include copper, gold, iron, lead, manganese, molybdenum, niobium, silver, tungsten, uranium and zinc (see Map 11).

Major copper producers operating include Cyprus Bagdad, Cyprus Mineral Park, and Emerald Isle. Cyprus Bagdad and Mineral Park

HALITE AND GYPSUM DEPOSITS



 AREA OF HALITE (SALT) AND GYPSUM DEPOSITS

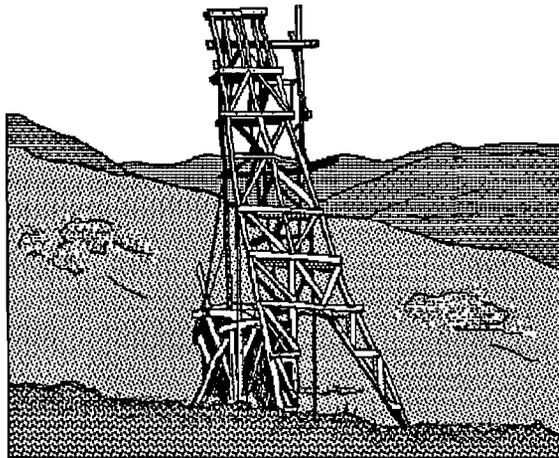


mine copper ore from predominantly patented property. Only small areas of public land are involved in these operations.

Western State's heap leach gold operation at the Portland Mine in the Black Mountains halted production in March 1989. Western States is now reclaiming the site. Several small leaching operations are reprocessing tailings piles of old mines for gold recovery.

Complete reclamation of a disturbed site takes from 5 to 15 years. After a compliance inspection determines that a site is completely reclaimed, the operator and claimant are released from obligation for reclaiming that site. A site is determined to be reclaimed when measures have been taken to reshape lands to an appropriate contour and, where necessary, to revegetate the disturbed areas to control erosion. New roads built for mining exploration or development are reclaimed when they are no longer needed.

Over 70 percent of all exploration on public lands is attributable to the small miner. Most activities involve prospecting and performing annual assessment work.



For the 366 notices and plans submitted between fiscal years 1980 and 1989, 864 acres were disturbed (see Table 20). Exploration consists of drilling, trenching and creating temporary access. Sites not yet reclaimed include those undergoing exploration and development and these where future re-entry is planned. Of the 864 acres disturbed, 436 have been reclaimed. The remaining mine sites will be reclaimed when exploration and development cease. Reclamation generally begins immediately or soon after the operator determines that no further exploration is warranted or production has been completed.

LANDS ACTIONS

Kingman Resource Area administers roughly 2.4 million acres of public lands in Mohave, Yavapai and Coconino counties. Public lands are generally well-blocked in such areas as the Hualapai Mountains, central and southern Black Mountains, Goodwin Mesa in the Aquarius Mountains and lands bordering Lake Mead National Recreation Area and the Hualapai Indian Reservation. Elsewhere public lands are scattered in checkerboard patterns.

State lands are generally in a checkerboard pattern, except for well-blocked areas in the far northwest quarter and southeast of Bullhead City.

The checkerboard landownership pattern creates many problems for the land manager. In many areas, private land has been subdivided and sold. Most of these subdivisions do not have legal access as now required by the Arizona Department of Real Estate to sell property. Buyers are required to sign a waiver stating that they know there is no legal access.

Those who attempt to acquire legal access invariably have to cross public land and there is a recent increase in corner crossing rights-of-way in order to get diagonally from one private section

**Table 20
Acres Disturbed by Mining**

Activity	Fiscal Year										Total
	80	81	82	83	84	85	86	87	88	89	
Notices submitted	0	11	12	12	7	8	43	56	69	64	282
* Average Acres Disturbed		16.5	18	18	10.5	12	64.5	84	103.5	96	423
Notices Open	0	0	0	0	0	0	2	7	25	34	
Acres Reclaimed		16.5	18	18	10.5	12	61.5	73.5	66	45	321
Total Acres Not Reclaimed	0	0	0	0	0	0	3	10.5	37.5	51	102
<i>*Average of 1.5 acres disturbed per notice</i>											
Plan of Operations	2	7	15	3	3	7	5	11	21	12	84
Plan-open			3	1	1	4	2	7	13	9	
Acres Disturbed	5	17	47	17	8	31	10	190	41	75	441
Acres Reclaimed	5	17	47	12	3	14	2	7	7	1	115
Total Acres not Reclaimed	0	0	0	5	5	17	8	183	34	74	326

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to the next. In many cases, the rights-of-way are assigned to Mohave County, thereby meeting the requirements for legal public access. The county may accept the rights-of-way for access but not necessarily for maintenance.

Inadvertent trespass often occurs when roads are maintained or bladed to these private checkerboard sections. Rights-of-way are issued to serve private land on a case-by-case basis after National Environmental Policy Act compliance with necessary stipulations to protect natural resources.

The checkerboard pattern also has created an illegal trash dumping problem on adjacent public land. Wherever there is a landfill, illegal dumping is commonly found within five miles regardless of landownership. Near more populated areas without landfills, residents dump on a regular basis. Case files are established for these dumps and an attempt is made to locate responsible parties. Files are closed after cleanup is accomplished.

As subdivisions are sometimes poorly or improperly marked, personal improvements may be found on adjacent public land. Public land is also used for occupancy by low income transients working in nearby communities. An aggressive approach is made to resolve unauthorized occupancy through removal and, in rare instances, through lease or sale.

The lands identified for disposal are in checkerboard areas or near urban and rural communities with low resource values. They serve as a trade base for lands high in resource values not only in this resource area but statewide. Since 1975, the resource area has completed private exchanges that transferred 43,377 acres of public land to private ownership within the disposal areas designated by the management framework plans. These exchanges reconveyed 223,291 acres of private lands to the United States within designated retention areas.

The exchange program between the BLM and the state of Arizona consolidates landownership to block up public lands for better management of natural resources and block up state lands to maximize revenue-producing development. A memorandum of understanding between the BLM and the state of Arizona establishing procedural guidelines for land exchanges was signed December 31, 1984. The state exchanges were processed under the Federal Land Policy and Management Act, Arizona Revised Statutes 37-604 and 37-722 and the Navajo-Hopi Relocation Act of 1980. But on March 30, 1990, the Arizona Supreme Court issued an opinion that state land exchanges were unconstitutional. A constitutional amendment approved by the voters of Arizona will be needed to allow further state land exchanges.

Since 1975, the BLM has transferred 102,774 acres of public land to the state and acquired 338,815 acres from the state.

The 6,165.11 acres identified in Appendix 17 for recreation and public purposes are mostly in disposal areas or adjacent to private land. These lands should meet the needs of every community in the resource area unless there is an incompatible use that may need special consideration. Approximately 3,184 acres of public land has have been leased or patented for recreation and public purposes.

Utility corridors have been identified along existing routes to limit major utilities to previously disturbed lands and to allow for future expansion needs.

Single use communication facilities will continue to be issued on a case-by-case basis, as needed, with stipulations to protect resources. Commercial mountaintop sites that have potential for development and their current status are listed below. The first five are in higher demand. The first three are covered by an existing communication site plan that sets standards for development.

Sites four and five are the most in need of communication site plans, with Site five being the highest priority. Sites have been generally haphazardly developed without a site plan. Mountaintops are usually where wildlife is more abundant. Sites three, four and seven were acquired through private exchanges subject to existing leases.

Site	Elevation	Access	Power	Users
1. Hayden Peak	8,390	road	electric	6
2. Potato Patch I	7,680	road	electric	6
3. Potato Patch II	7,240	road	electric	2
4. Getz Peak	7,680	road	electric	6
5. Oatman	4,000	road	electric	8
6. Mount Perkins	5,456	helicopter	solar	1
7. N. Mount Perkins	4,800	road	solar	1
8. Willow Beach	3,480	road	solar	1
9. Windy Point	6,200	road	electric	1
10. Patterson Slope	4,339	road	electric	2
11. Cherum Peak	6,983	helicopter	solar	0

Filming is popular in the resource area, particularly along Historic Route 66 and Red Lake. Permits are issued on a case-by-case basis after National Environmental Policy Act compliance with stipulations to protect resources. There currently are no commercial leases in the resource area.

Payment in Lieu of Taxes

The Payments in Lieu-of-Taxes Act provides money to county governments as compensation for the loss of property tax revenue on tax-exempt federal land. The BLM has been delegated the responsibility of administering the Act. These payments supplement other federal receipt-sharing funds which local governments may be receiving. The payments are based on the number of acres of "entitlement land" within the county. Entitlement land consists of land administered by the BLM, National Park System, U. S. Forest Service and land dedicated to use of federal water resource development projects. The payments made to Mohave County have increased from \$971,656 in 1985 to \$997,187 in 1989, approaching the maximum of \$1,000,000.00. After the ceiling is reached, the county will not receive additional money, unless the ceiling is changed, for lands acquired by the BLM. These values include all of Mohave County, not only the portion in the Kingman Resource Area. During this timeframe, several land exchanges added to the entitlement land.

SOIL AND VEGETATION RESOURCES

The state of Arizona is divided into major land resource areas and subresource areas as described in the Soil Conservation Service Handbook 269 and the Soil Conservation Service National Range Handbook 269 and the Soil Conservation Service National Range Handbook. These subresource areas are geographic areas of similar topography, climate, soils and vegetation. Four major land resource areas occur within the Kingman Resource Area; within these areas are seven subresource areas. The soils and potential natural vegetation for each of the seven subresource areas are described herein to give a general overview of the area (see Table 21). More specific soil and vegetation information follows.

Soil Resources

Soils over the resource area are extremely diverse. Fairly detailed descriptions of soils are included in completed Soil Conservation Service soil surveys in the southern and eastern portions of the planning area. A soil survey underway for the northern portion of the planning area should be completed in 1993. Management decisions requiring soil information are based on detailed information from these surveys. A complete description of the Kingman Resource Area's soil is not practical in this document because of the volume of information involved. Specific information may be obtained from the Kingman Resource Area Office or the Soil Conservation Service Office in Kingman.

WATER AND AIR RESOURCES

Water Resources

All of the resource area lies within the lower Colorado River basin and includes portions of the Bill Williams River basin, Detrital Wash, Truxton/Hualapai Wash and Sacramento Wash. The following descriptions of BLM water resources focus on floodplain management, water availability and water quality.

Floodplains

A base floodplain is an area expected to be inundated by flood waters on the average of once in 100 years. As to be expected, these floodplains occur throughout the resource area, in and next to waterways.

Theoretically, every small wash and gully has a base floodplain associated with it. The task of delimiting each of these, much less managing them, would be impractical. For this reason, flood insurance rate maps prepared by the Federal Emergency Management Agency are generally accepted as the best delineations of base floodplains. The Phoenix District has coverage for most of its Kingman Resource Area.

Water Quantity

The resource area has many small springs, seeps, wells and stock-ponds. The most typical uses of water on public lands include wildlife and livestock watering, nonconsumptive recreational uses, maintenance of riparian vegetation and mining. Future conflicts for

water are expected as municipal, industrial and agricultural consumptive demands increase and compete with nonconsumptive instream flow requirements of important streams.

Legal availability of water is provided by the assertion of public water reserve doctrine and compliance with state water law. The BLM filed for instream flow water rights with the Arizona Department of Water Resources in support of fish and wildlife and recreation beneficial uses on Burro and Francis creeks in 1984 and the Bill Williams River in 1988. Other important perennial streams (e.g., Big Sandy River, Wright Creek, Trout Creek) may need this protection in the near future.

The BLM will assert its claim to water in conjunction with the state of Arizona adjudication effort. In the adjudication process, the court will determine the legal right to use water, the amount authorized and the priority of that right. Like any other water user, the BLM is required to claim water sources it believes it is entitled to use. Accordingly, the BLM will submit claims as required by the court to protect its water uses.

Water Quality

Although the Arizona Department of Health Services documented that surface quality was generally good overall in the state (ADHS, 1984), the lack of data was cited as a major hindrance to assessing water quality in Arizona. The Arizona Department of Health Services called for other agencies to become more involved in water quality assessment and coordination.

The BLM generally monitors water quality where it has special resource management responsibility for fish, wildlife, riparian vegetation, and developed recreation. In 1983, the BLM contracted with the Arizona Department of Health Services for a study in Burro Creek to detect effects from mining on water quality. The Phoenix District currently implements a Unique Waters compliance monitoring program that began on Burro and Francis creeks in 1986.

Non-point source pollution problems appear to be the most significant type of water pollution. Surface pollution typically includes turbidity (sediment), heavy metals, total dissolved solids, nutrients and bacteria. Potential sources of these pollutants from BLM lands include natural dissolution of soil salts, livestock grazing, recreation (off-highway vehicles and dispersed camping near water) and mining.

Air Resources

Under the National Ambient Air Quality Standards, most BLM-administered lands within the Kingman Resource Area are rated Class II. The BLM manages no Class I areas, but one Class I area lies contiguous to Grand Canyon National Park (see Section 162 of the Clean Air Act, as amended in 1977).

WATERSHED MANAGEMENT

The U.S. Geological Survey has delineated watershed management units for Arizona based on topographical features (see USGS Hydrologic Unit Map-1974, state of Arizona). These units are generally large areas. For more effective resource management, the Kingman

Table 21
DESCRIPTION OF MAJOR LAND RESOURCE AREAS AND SUBRESOURCE UNITS

Mapping Unit	Representative Soils	Potential Natural Vegetation
SONORAN BASIN AND RANGE Subresource Area D30-2 (Mohave Desert Shrub)	<p>Soils Typic Calciorthids that are deep and range in texture from gravelly sandy loam to gravelly loam make up a large part of the area (Gunsight and Rillito series). Deep Typic Torrifluvents ranging in texture from moderately coarse to fine are along the flood plains and low alluvial fans in the area (Antho, Indio, Holtville, Ripley and Glenbar series). Other Typic Torrifluvents occur along the flood plain of the Colorado River that are primarily moderately fine or textured, deep and high in soluble salt accumulations (Gadsen and Indio series, saline phases). Typic Torriorthents (Carrizo and Laposas series) vary in depth from deep to moderately deep and range in texture from cobbly sand to gravelly loam. These soils occur in desert washes, flood plains and low hills and mountains respectively. Typic Durorthids (Cherioni series) and Lithic Haplargids (Gachado series) are shallow, medium textured soils that dominate the volcanic hills and mountains. Typic Torripsamments that are coarse textured and deep occur on drainage ways, fans and dunes (Lagunita and Rosita series). Fine textured and deep Vertic Torrifluvents also occur in bottom positions along the Colorado River (Gadsen and Kofa series).</p>	<p>Potential Natural Vegetation The soils in this area will generally support a Mohave Desert Shrub plant community. Dominant shrubs on upland soils include creosote bush, white bursage, ratany, Mormonella, paloverde, brittlebush and various cactus species. Important grasses on upland soils include big galleta, bush muhly, slim tridens, perennial threeawns and dropseeds. Bottomland soils, with the exception of the saline soils adjacent to the Colorado river, are dominated by perennial midgrasses including big galleta, bush muhly and perennial threeawns. Dominant shrubs on bottomland soils include screwbean mesquite, catclaw acacia, paloverde, burrobush, smoketree and wolfberry. Salt influenced bottomland soils are almost exclusively shrub and tree sites. These soils are dominated by arrowweed, salt cedar, saltbush and mesquite. Salt cedars are not native, but have become naturalized to the area. Wet periods particularly in the spring months will produce large quantities of annual vegetation that is important to livestock operators. These plants are annual grasses and forbs and include lupine, desert indian wheat, primroses, needle grama, sixweeks grama and sixweeks fescue.</p>
Subresource Area D30-3 (Grand Canyon Desert Shrub)	<p>Soils Typic torrifluvents that are deep and range in texture from moderately coarse to fine make up a large part of the area (Anthony, Gila, Glendale, Vinton, Agua and Grabe series). Some of these Typic Torrifluvents occupy a large portion of valley areas in fan and terrace positions. Typic Haplargids are deep and range in texture from moderately coarse to fine (Continental, Eba, Mohave, Bitter Spring and Cornville series). Typic Calciorthids which are deep, high in lime and generally medium textured occur as rolling hills and plains dissected by numerous desert washes (Latene, Nickel and Whitlock series). Other soils very high in lime are very shallow and generally medium textured. These soils are Typic Paleorthids (Tencee and Cave series). Lithic Torriorthents, ranging in depth from very shallow to shallow and in texture from coarse to medium, occur on low volcanic hills and mountains (House Mountain series). Other Lithic Torriorthents occur on granitic hills and mountains (Cellar series).</p>	<p>Potential Natural Vegetation The soils in this area will support Mohave Desert Shrub and mixed grassland plant communities. Blackbrush can dominate some upland soils in the northern portion of the area. Dominant shrubs on other upland soils include Joshua tree, creosote bush, ratany, yucca, white bursage, winterfat and various cactus species. Dominant midgrasses on upland soils include big galleta, bush muhly, black grama, Indian ricegrass, desert needlegrass, dropseeds and perennial threeawns. Bottomland soils are dominated by perennial midgrasses including big galleta, bush muhly, Indian ricegrass, desert needlegrass, perennial threeawns and dropseeds. Fine textured bottom land soils are dominated by alkali sacaton, tobosa, vine-mesquite, fourwing saltbush and shadscale. Wet periods, particularly in the spring months, will produce large quantities of annual vegetation important for livestock forage. Some of the more important annual plants include mares fat, desert indian wheat, other edible forbs, sixweeks grama, sixweeks fescue and red sprangletop.</p>
(COLORADO AND GREEN RIVER PLATEAUS) Subresource Area D35-1 (Colorado Plateau Mixed Grass Plain)	<p>Soils Torriorthents ranging in texture from coarse to fine and in depth from very shallow to deep make up a large part of the area (Moenkopie, Shalet, Claysprings, Fruitland and Winona series). Deep Torrifluvents ranging in texture from coarse to fine are along the flood plains and low alluvial fans (Trial, Ives, Tours and Navajo series). Torripsamments (Sheppard series) occur in much of the area, along with a rather large percentage of rock outcrop. Haplargids (Boysag series) are shallow, well drained, dark colored soils over Kaibab limestone and closely associated with the Winona series. Also in the unit are small areas of Badland (Miscellaneous Area) where geologic erosion keeps pace with soil development in the soft shales of the Chinle Formation. Camborthids (Moenkopie-like soils having a cambic horizon) also are present in the unit.</p>	<p>Potential Natural Vegetation The upland soils in this area will support mid- and short-grasses dominated by needlegrasses, Indian ricegrass, galleta and blue grama. The bottom soils are characterized by alkali sacaton, western wheatgrass and vine mesquite. Important shrubs and half shrubs are fourwing saltbush, winterfat, and Bigelow sagebrush. Some scattered open savannahs exist on shallow soils and are dominated by one-seed juniper and cliffrose.</p>

(continued)

Table 21 (continued)

DESCRIPTION OF MAJOR LAND RESOURCE AREAS AND SUBRESOURCE UNITS

Mapping Unit	Representative Soils	Potential Natural Vegetation
<p>Subresource Area D35-3 (Colorado Plateau Sagebrush - Grassland)</p>	<p>Moenkopie soils are very shallow and shallow, well-drained, moderately coarse to medium textured soils over sandstone and sandy shale. Shalet soils are shallow and very shallow, well-drained, moderately fine-textured soils residual on shale. Claysprings soils are shallow, well-drained, fine-textured soils over Chinle Shale. The Fruitland soils are deep, well-drained, moderately coarse textured soils formed in moderately coarse, calcareous alluvial sediments derived from sandstone, shale, siltstone and deposits of Quaternary alluvium. The Winona soils are very shallow, well-drained, carbonatic soils over Kaibab limestone. The coarse textured Trail soils, moderately coarse-textured Ives, moderately fine-textured Tours and fine-textured Navajo soils are well-drained, deep soils formed in recent alluvium. Sheppard soils are coarse-textured, somewhat excessively drained, deep soils formed in coarse-textured, wind-worked materials.</p> <p>Soils Lithic Torriorthents, Lithic Torripsammets, Ustic and Typic Torrifluvents, Ustic Torripsammets, Lithic Ustollic Haplargids and Aridic and Lithic Arguistolls are the major soils in the area. Lithic Torriorthents (Winona, Moenkopie and Piute) are shallow and very shallow, loamy and sandy soils on limestone, sandy shale and sandstone uplands and plateaus respectively. Lithic Torripsammets (Schooner) are shallow and very shallow sandy soils on sandstone uplands. Ustic and Typic Torrifluvents (Redbank, Navajo and Tours) are deep, coarse and fine textured soils on flood plains. Ustic Torripsammets (Mespun) are deep, sandy soils on uplands. Lithic Ustollic Haplargids (Daze) are very shallow soils with clayey subsoils.</p>	<p>Potential Natural Vegetation The soils in this area will support mid- and short-grasses as well as shrubs. Sparse stands of juniper and pinyon are found on some sites. Indian ricegrass, needle and thread and western wheatgrass are the dominant cool-season grasses. Galleta, black grama, blue grama and sand dropseed are the major warm-season grasses. Winterfat, fourwing saltbush and big sagebrush are the important shrubs in this area.</p>
<p>ARIZONA AND NEW MEXICO MOUNTAINS Subresource Area D39-1 (Mogollon Plateau Coniferous Forest)</p>	<p>Soils Mollic Eutroboralfs are probably the most extensive soils in this subresource area. They are moderately deep to deep, stony to cindery and well drained, and have textures ranging from loam to clay. Mineralogy is both mixed and montmorillonitic. Dandrea soils, formed on schist, are in a subhumid moisture regime and are generally dry in May and June. The loamy-skeletal (Ess) soils, fine-loamy (Sponseller) soils and fine (Brolliar) soils are formed on basalt, cinders and bombs. They are in a subhumid climate and generally dry in May and June. The fine (Hogg) soils are formed on sandstone.</p> <p>Cryoborolls occur on the higher mountains and in concave sites on the high plateaus where air drainage is restricted. The Argic Pachic (Gordo) soils have gravelly loam textures and are on the steep high mountain slopes. The clayey-skeletal (Tatiyee) soils are on nearly level to moderately sloping meadows at high elevations. Extensive areas of Cryoboralfs have been formed in sandstone and exposed areas of cherty limestone. The clayey-skeletal, Glossic (Soldier) soils have formed in a cherty limestone member of the Kaibab formation. They are deep and moderately well drained. The fine (McVickers) soils have formed on sandstone and are deep and well drained. They are usually dry in May and June.</p>	<p>Potential Natural Vegetation Ponderosa pine dominates the area. Other important tree species include Gambel oak, Arizona walnut, sycamore, aspen, Douglas fir and blue spruce. Important understory grasses include Arizona and sheep fescue, mountain and screwleaf muhly, Junegrass, mutongrass, pine dropseed and dryland sedges. On wet-and-dry meadows dominated by cool-season grasses, rushes and sedges are scattered throughout the area. Principal plant species in these meadows include redbud, hairgrass, bluegrasses, rushes, sedges, willows, wildrose and other forbs.</p>

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Table 21 (continued)
DESCRIPTION OF MAJOR LAND RESOURCE AREAS AND SUBRESOURCE UNITS

Mapping Unit	Representative Soils	Potential Natural Vegetation
<p>Subresource Area D39-4 (Arizona Interior Chaparral - Grassland)</p>	<p>The frigid, Typic Ustorthents are gravelly, moderately coarse textured soils formed on granitic geologic materials. The Mirabal soils are moderately deep, well drained and are not dry for more than half of the growing season in most years. Moderately coarse textured, gravelly and cobbly Cryorthents occur on the steep slopes of the higher mountains. Baldy soils are deep and well drained. Precipitation is generally 30 inches or more per year.</p> <p>Soils Dominant soils are Orthents - very shallow and shallow, gravelly and cobbly, medium and moderately fine textured, thermic soils with mixed mineralogy. They are Lithic Torriorthents (Cellar, Courthouse, House Mountain and Moano series). The Cellar soils are formed on granite and granite-related rocks on hills and low mountains with rolling to steep slopes. The Courthouse soils are formed on sandstone on undulating-to-steep hills and low mountains. The House Mountain soils are formed on basalt and related rocks and are on nearly-level to steep plains, hills and low mountains. The Moano soils are formed on schist and are on rolling-to-steep hills and mountains.</p> <p>Ustolls are nearly as prevalent as the Orthents and are very shallow and shallow, gravelly and cobbly, medium textured, thermic and mesic soils with dark surfaces. They are Lithic Haplustolls (Faraway and Tortugas series). The Faraway soils are formed on rhyolite, andesite and granitic, dominantly acid igneous rocks on hills and low mountains with rolling-to-very-steep slopes and mixed mineralogy. The Tortugas soils are formed on dolomitic limestone on undulating-to-steep hills and low mountains with carbonatic mineralogy. Ustolls - shallow, gravelly and cobbly, fine-textured soils with mesic temperature regimes and montmorillonitic mineralogy, are important. They are Lithic Argiustolls (Luzena and Cabezon series). The Luzena soils are formed on hills and low mountains of andesite, rhyolite and associated tuffs with undulating-to-steep slopes. The Cabezon soils are on nearly-level to rolling basalt plains. Cumulic Haplustolls (Lynx series) are present along the swales and drainageways. Lynx soils are deep, moderately fine textured and nearly level with mixed mineralogy and mesic temperature regimes.</p>	<p>Potential Natural Vegetation Potential plant communities are mixed shrub-grasslands. The percentage of shrubs increase on sites with shallow soils and in areas with rock outcrops. Important upland grasses include Junegrass, bottlebrush squirreltail, needle and thread, desert needlegrass, sidecoats, black, blue and hairy grama, cane bluestem, muttongrass, New Mexico needlegrass, tobosa and curly mesquite. Bottomland soils are characterized by grassland plant communities dominated by western wheatgrass, sacaton, vine mesquite, spike muhly, sidecoats grama and sedges. Major shrubs are birchleaf mountain mahogany, desert ceanothus, sugar sumac, skunkbush sumac, shrubby buckwheat, turbinella oak, Emory oak and Arizona white oak, manzanita, silktassel, canotia and jojoba.</p>
<p>CENTRAL ARIZONA BASIN AND RANGE Subresource Area D40-3 (Central Arizona Desert Grassland-Shrub)</p>	<p>Soils The soils in subresource area D40-3 are thermic. Lithic Haplargids (Lehmans series), Lithic Torriorthents (Cellar and House Mountain series) and Rock outcrop make up about 60 percent of the area. Haplargids (Mohave, Tres Hermanos and Vekol series) and Calciorhids (Latene and Rillino series) comprise about 30 percent of the area. Torrifluvents (Glendale, Gila, Anthony and Vinton series) make up the final 10 percent.</p>	<p>Potential Natural Vegetation The soils in this area will generally support a short- and mid-grass grassland and a mixed Mohave desert shrub-grassland. Upland soils are dominated by grass species such as big galleta, bush muhly, black grama, sidecoats grama, desert needlegrass, slim tridens and dropseeds. Dominant upland shrubs include yucca, winterfat, woolly and white bursage, flattop buckwheat, shrubby buckwheat, Mormon tea and range ratany. Paloverde and Joshua are the dominant tree species. Low-lying soils receive extra run-in moisture and are dominated by midgrasses, including tobosa, big galleta, bush muhly, vine mesquite, western wheatgrass and sidecoats grama. Important shrubs include catclaw (acacia), desert willow, twinberry, false mesquite, Mormon tea, and fourwing saltbush.</p> <p>The production of annual grasses and forbs may be important some years following good precipitation periods.</p>

Resource Area determined allotment boundaries to be the logical management boundaries for site-specific watershed treatments. Current watershed condition has been evaluated on each grazing allotment. This evaluation considered current erosion conditions, potential erosion hazards and the soil temperature/moisture regime.

Appendix 19 lists each grazing allotment's assigned watershed category. The watershed categories are defined in Table 22.

**Table 22
Watershed Categories**

Category	Description
I	Watershed units are in satisfactory erosion condition and are not especially susceptible to wind and water erosion.
II	Watershed units are in satisfactory erosion condition, but are susceptible to wind and water erosion following disturbance.
III	Watershed units are in unsatisfactory erosion condition, but because of the soil temperature/moisture regime these soils would be unresponsive to treatment.
IV	Watershed units are in unsatisfactory erosion condition and the soils would be responsive to treatment.

Allotments in either category I or II are in satisfactory or better erosion condition, and these watersheds are functioning properly. Soil cover is adequate for that range site. Moderate peak runoff is maintained because of good infiltration and the absence of numerous gullies. Erosion is within acceptable levels. But Category II watersheds are particularly vulnerable to surface disturbances. Management of Category II watersheds would therefore focus on preventing undue surface disturbances.

Allotments in categories III and IV are in unsatisfactory erosion condition. Typified by poor soil cover, accelerated erosion, increased runoff, sediment yield and salinity discharge, these allotments contribute to the degradation of both air and water quality. Watersheds in Category III are too hot and dry for land treatments, such as seedings, to be successful. Category IV watersheds have climatic conditions that make them suitable for rehabilitation.

Soil salinity was not a classification criterion in this categorization. Rather, the relationship between erosion condition and sediment yield was inferred to have yet another relationship with salinity discharge. A highly eroded watershed will carry more sediments downstream. Where the watershed has saline soils, those sediments will also be saline. Salinity becomes important in planning management of erosion-prone or debilitated watersheds.

The exact locations and extent of salt-affected soils will be determined from ongoing and unpublished soil survey data as it is released. Map 31 shows approximate locations of slightly saline areas.

Slightly saline soils occur in Detrital Valley, Sacramento Valley, Dutch Flat, Grapevine Wash and the Little Colorado River. Exact acreage figures can be obtained on completion of the soil survey.

Erosion is caused by both wind and water. But wind erosion is only occasionally severe, when open, bare or almost bare desert areas become dry and subjected to strong winds. Erosion due to water action is relatively minor except for localized sheet and gully erosion. The basic potential for water erosion is generally low because of the following characteristics.

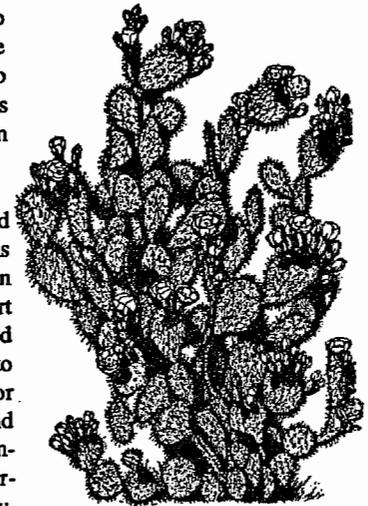
1. A lack of steep slopes. Most topography consists of moderately to strongly sloping uplands, dissected with coalescing alluvial fans and nearly level, broad valley floors interrupted by several low to moderate elevation mountain ranges.
2. Soils of a relatively coarse texture with a moderate to moderately rapid permeability rate.
3. A relatively low annual rainfall, of which more than half falls as gentle winter rains.

Areas of severe/critical erosion occur on alluvial fans near Wikieup, the Big Sandy River Valley, the Burro Creek area, the lands next to the Santa Maria River/Alamo Lake areas, the Dutch Flat area and small areas in the Sacramento, Detrital and Hualapai valleys, Hackberry and Truxton. Erosion conditions in most of the areas in the severe/critical class have been caused by geologic structure formations, drought, wind and overuse by livestock.

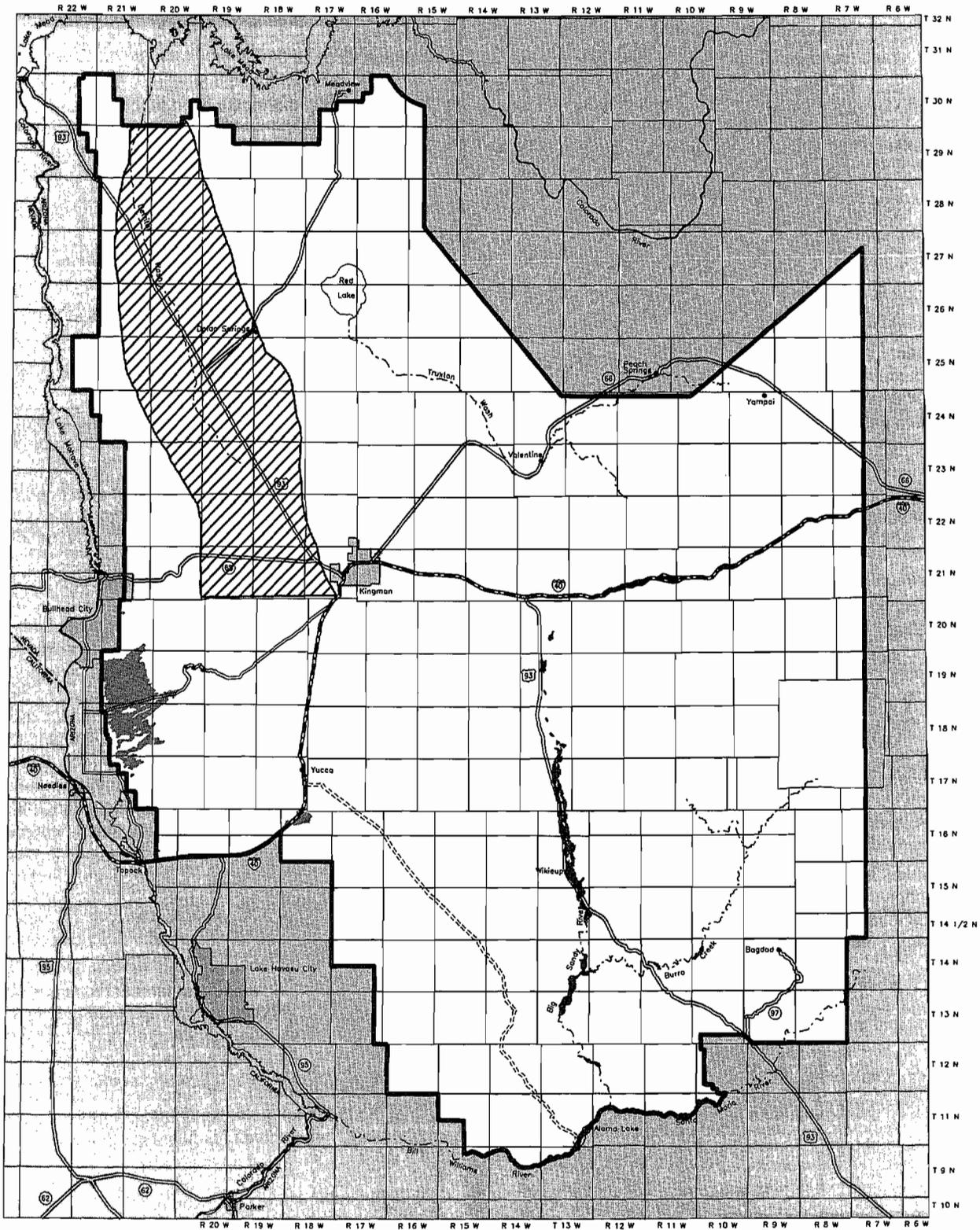
Riparian zones, especially along Burro Creek, Conger Creek, the Big Sandy River, Trout Creek and the Santa Maria River/Alamo Lake, have several small areas of moderate to severe/critical erosion along streambanks and in floodplains. Erosion in these areas is aggravated by heavy grazing pressure from livestock, wild burros and wildlife attracted by water, shade and palatable vegetation.

VEGETATIVE PRODUCTS

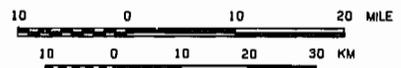
As diverse as the soils in which they grow, vegetative resources are influenced by a variety of other interrelated environmental factors, such as precipitation, topography and management practices. The southern and eastern portions of the resource area have been mapped in detail to delineate range or ecological sites, which, as unique products of their environmental factors, differ in their ability to produce a characteristic vegetative community. Ecological site mapping in the northern portion is ongoing and should be completed in 1993. This ecological site information provides the basic ecological data for planning the use, development, rehabilitation and management of rangeland.



SOIL SALINITY



-  SURVEYED SOILS – NON TO SLIGHTLY SALINE
-  SURVEYED SOILS – SLIGHTLY TO STRONGLY SALINE
-  UNSURVEYED SOILS WITH POTENTIAL FOR SALINITY



Map 31

Aside from the livestock production demand for forage, a variety of other native plants are also in demand. One of the most notable is firewood. Public lands support fairly large stands of pinyon and juniper trees in the northeast near Truxton. The extent of this resource has not yet been determined, in part because the demand for firewood has only recently escalated. The Kingman Resource Area issues 400 private woodcutting permits and 12 commercial permits each year.

A large demand has also developed for *Yucca schidigera*, a large desert-type plant. This plant is used as a water retention agent, a livestock feed supplement and for fertilizer and plant mulch. The Kingman Resource Area has issued a permit to harvest 50 tons of this plant each year. The extent of this resource has not yet been inventoried.

A large demand also exists for native plants for landscaping. This demand comes not only from commercial landscapers and nurseries but also from individuals wanting to landscape their yards. These requests have been limited to salvage operations where land is destined to be disturbed.

Demand for hardwoods such as catclaw acacia, mesquite and ironwood has also increased in recent years. These woods are desired for firewood and also for artistic purposes. These species occur on an extremely limited basis within the resource area.

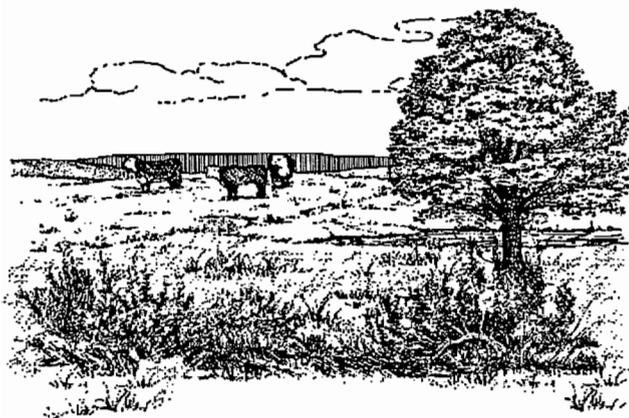
RANGELAND MANAGEMENT

At present, 57 ranch operators hold permits or leases on 83 grazing allotments (see Map 32). A total of 135,411 animal unit months (AUMs) of active grazing use is allocated to these allotments. Roughly 2,279,000 acres of public land are being grazed. Most of the grazing use involves cattle, but some involves horses. Past licensing has also included a small amount of sheep or goat grazing.

Ranching operations on the public lands tend to be yearlong cow-calf enterprises. Some ranchers use public lands only seasonally.

Many allotments contain private and state-owned lands intermingled with public lands. The BLM administers grazing on the public lands.

Each Kingman Resource Area grazing allotment has been placed into one of three "selective management" categories to establish priorities for management. The criteria used in placing an allotment into a category included range condition, present management situation and potential resource production, resource use conflicts and the



opportunity for economic returns from public investments. The three categories used and the objective for each category are shown in Table 23.

**Table 23
Selective Management Categories**

Category	Objective	No. of Allotments
Maintain	Maintain current satisfactory resource conditions	12
Improve	Improve current unsatisfactory resource conditions	44
Custodial	Manage custodially while protecting existing resource values	27

Source: Kingman Resource Area files

A complete listing of Kingman Resource Area grazing allotments and the categories into which they have been placed can be found in Appendix 1.

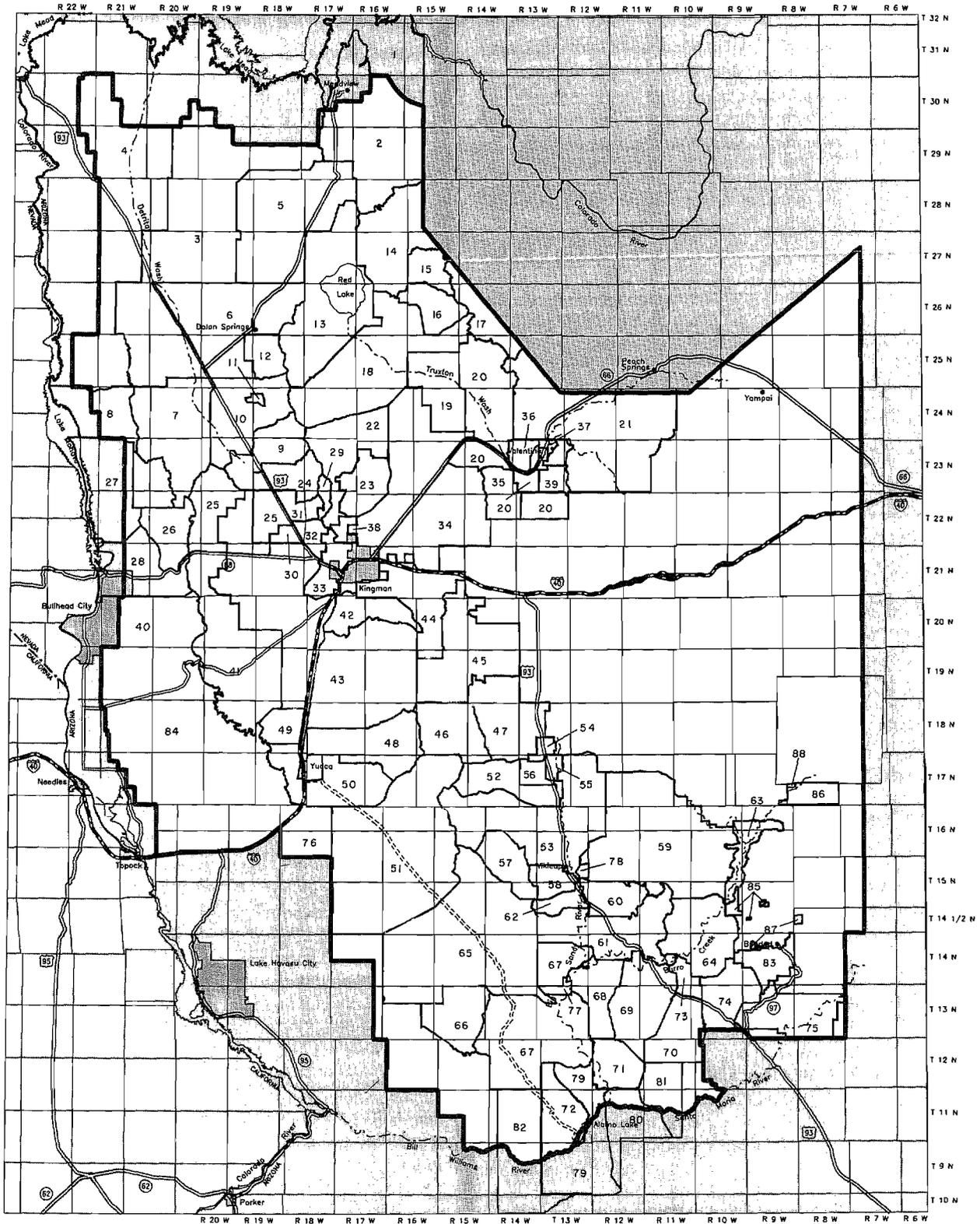
Each grazing allotment is also classified according to the type of forage available to livestock. Two classifications are used: perennial and ephemeral. Perennial forage is available consistently each year through perennially producing grasses, forbs and shrubs. Ephemeral forage consists of annual grasses and forbs that become productive only in response to adequate spring moisture and warm temperatures. Allotments have been placed into one of these two categories or a combination of both. The allocation of active grazing preference is based only on the availability of perennial forage. **The allocation will be used on an equitable ratio to achieve an ecological balance between livestock and other ungulates.** On ephemeral allotments, grazing is authorized only when ephemeral forage is abundant. The designation for each grazing allotment appears in Appendix 1.

BLM grazing preference is allocated to qualified parties who own or control "base property" that meets federal requirements. Livestock water serves as base property for most authorized grazing use. On scattered public land parcels at the far eastern end of the resource area, land serves as the qualifying base for the grazing preference. The type of qualifying base property for each allotment is shown in Appendix 1.

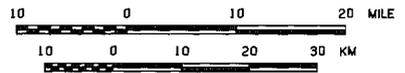
Twenty-two allotment management plans have been prepared for 26 grazing allotments, completed mostly in the 1980s. These call for developing range improvements and implementing pasture rotation to provide rest for forage plants. Allotment management plans are in various stages of implementation, and some need revising (see Appendix 1). Allotment management plans need to be completed for 31 Improve and Maintain category allotments.

An abundance of range improvement work has taken place in the Kingman Resource Area to improve the effectiveness of livestock grazing. Most allotment boundaries are defined by fences except where natural barriers effectively control livestock. Many allotments are further divided by interior fences to form pastures, which control livestock movement. Numerous springs, wells, dirt tanks and rain catchments have been developed to provide water for livestock and wildlife.

ALLOTMENT BOUNDARIES



—— ALLOTMENT BOUNDARY



Index for Allotment Maps

- | | | |
|---------------------------|-----------------------|------------------------------|
| 1. Diamond Bar B | 31. Pine Springs | 61. Greenwood Peak Community |
| 2. Diamond Bar A | 32. Castle Rock | 62. Groom Peak |
| 3. Big Ranch A | 33. Cook Canyon | 63. Burro Creek |
| 4. Big Ranch B | 34. West Peacock | 64. Bagdad |
| 5. Gold Basin | 35. Peacock Mountain | 65. Chicken Springs |
| 6. Dolan Springs | 36. Truxton Canyon A | 66. Bateman Springs |
| 7. Fort MacEwen A | 37. Truxton Canyon B | 67. Artillery Peak |
| 8. Fort MacEwen B | 38. Feldspar | 68. Greenwood Community |
| 9. Cerbat | 39. Valentine | 69. Burro Creek Ranch |
| 10. Quail Springs | 40. Silver Creek | 70. Arrastra Mountain |
| 11. Turkey Track | 41. Black Mountain | 71. Chino Springs |
| 12. Mount Tipton | 42. Lazy YU A | 72. Alamo Crossing |
| 13. Cane Springs | 43. Walnut Creek | 73. Black Mesa A |
| 14. Upper Music Mountains | 44. Hualapai Peak | 74. Black Mesa B |
| 15. Clay Springs | 45. Yellow Pine | 75. Gibson |
| 16. Middle Water | 46. Hibernia Peak A | 76. Crossman Peak |
| 17. Music Mountain | 47. Hibernia Peak B | 77. D.O.R. |
| 18. Cedar Canyon | 48. Boriana A | 78. Hot Springs |
| 19. Walapai Ranch | 49. Boriana B | 79. Alamo |
| 20. Hackberry | 50. Happy Jack Wash | 80. Palmerita |
| 21. Crozier Canyon | 51. La Cienega | 81. Santa Maria Community |
| 22. Canyon Ranch A | 52. Diamond Joe | 82. Primrose |
| 23. Canyon Ranch B | 53. Big Sandy | 83. Kellis |
| 24. Mineral Park | 54. Cane Springs Wash | 84. Wildlife Reserve |
| 25. Mud Springs | 55. Sandy | 85. Yolo Lease |
| 26. Gediondia | 56. Little Cane | 86. McElhaney Lease |
| 27. Portland Springs | 57. Los Molinos | 87. Byner Lease |
| 28. Thumb Butte | 58. Wikieup | 88. JJJ Lease |
| 29. Stockton Hill | 59. Francis Creek | |
| 30. Curtain | 60. Gray Wash | |



Several vegetation treatments have been undertaken to change the composition of the plant community. These treatments have involved herbicides, prescribed burning, roller chopping and reseeding of exotic or native plants. Range improvements have been funded by the BLM and grazing permittees.

Monitoring studies have been established on all of the grazing allotments in the Improve or Maintain selective management categories. These studies include (1) collecting climate data to determine the effectiveness of the growing season for forage plants, (2) collecting actual grazing use data to be compared with measures of forage removed, (3) conducting utilization transects to estimate forage removed and (4) conducting trend transects to determine long-term changes in the health of the vegetative community.

CULTURAL RESOURCES

Cultural resources have developed from centuries of human occupation, which can be divided into five time periods: Paleoindian (9500 to 7000 B.C.), Archaic (7000 B.C. to A.D. 500), Formative (A.D. 500 to 1300), Protohistoric (A.D. 1300 to 1700) and Historic (A.D. 1700 to 1945).

Cultural resources are generally concentrated near seeps and springs in the mountain ranges and along the few perennial streams such as

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Burro Creek, the Big Sandy River and the Colorado River. The mountainous areas were also important because they provided a wide variety of plant and animal resources. Prehistoric and historic mining occurred mainly in the mountains. Table 24 summarizes cultural resources located mainly in the mountains, recorded as of 1990.

Table 24
Cultural Resources Recorded as of 1990

Site Type	Number Recorded
Artifact Scatters	740
Rock Shelters	140
Historic Sites	130
Rock Art	37
Rock Features	30
Trails	12
Pueblos	7
Quarries	6
Total	1,102

Source: Kingman Resource Area files and Class I overviews

The age of most cultural resources is difficult to determine. The most common Native American resources are artifact scatters, consisting of nondiagnostic lithic (stone), shard (ceramic) and groundstone (metate and mano) artifacts. Much of the lithic and groundstone technology remained unchanged for thousands of years, making it difficult to date cultural resources. The most common shard type, Tizon Brown, was made from A.D. 700 to 1870.

The types and numbers of cultural resources mentioned above represent only these cultural resources that have been found. Only 48,450 acres (two percent of the resource area) has been surveyed. From an extrapolation of these figures, the resource area has more than 67,000 sites.

Important Cultural Resource Areas

While many cultural resources are known to exist in the resource area, some areas are known to contain particularly significant or high concentrations of sites. The areas described below are recognized as priority areas, but other areas of cultural significance also exist.

The Joshua Tree Forest area near the Grand Wash Cliffs is a spectacularly scenic area that also has some highly significant cultural resources. This area has some of the largest (five millimeter diameter) roasting pits in the Southwest, but no known large habitation sites in the area account for this activity. Who made these impressive features and when they were made are unknown.

The area around Wright Creek near Truxton is one of the few places in the resource area that had perennial water. The area is also a transition zone between the Colorado Plateau and the Great Basin. The resource area has a high density of Cohonina campsites dating from A.D. 700 to 1150 that are mixed with a few Prescott Culture pueblos dating from A.D. 1000 to 1250. This is the westernmost extension of these two cultures that were influenced by the Anasazi culture to the north and east.

The Black Mountains have a variety of significant cultural resources. The oldest known site (Bighorn Cave --1500 B.C.) is in this area. At least two other rock shelters have yielded rare prehistoric baskets. The Black Mountains have polychrome pictographs (rock paintings) and many petroglyphs. The Beale-Mojave Road, a combination wagon road and old Indian trail, crosses the area. Early (1860s) Caucasian stone cabins of prospecting troops from Ft. Mojave are also present.

The Bullhead City area is one of the main homelands of the Mojave Indians. The major prehistoric activity recorded is an extensive macro-flaking industry where, over a 36-square-mile area, large boulders were broken and shaped into blanks for metates and pestles. The area also has prehistoric trails, shrines, petroglyphs, rock rings and the best preserved section of the Beale-Mojave Road.

Burro Creek, in the southeast portion of the planning area, is another perennial water source. This area has Prescott Culture pueblos and campsites. Burro Creek has several obsidian sources used for prehistoric tool manufacturing. This area has historic Yavapai and Hualapai cultural resources. Information from these resources may answer questions concerning the above mentioned tribes' origin and development. This area has socio-cultural values for the Yavapai tribe. Several historic mines have been recorded, and the use of the arrastra, an early type of mill for gold and silver extraction, was common in this area. A recently (1990) developed memorandum of understanding between the BLM and Arizona State University facilitated intensive cultural resource surveys, beginning in the fall of 1991.

The area near Wikieup has a 25-mile-long Pliocene lake containing well-preserved fossils of birds, horses, camels and other animals. Prehistoric Indian camps, petroglyphs and lithic tool manufacturing have been recorded. The historic 19th century Carrow/Stephens ranches lie along the Big Sandy River. These ranches are well preserved and are suitable for restoration and development as recreation/interpretation areas for the public.

The Cerbat Mountains northwest of Kingman contain hundreds of old mines. Prehistoric Indian turquoise mines with dozens of stone picks and hammers have been found. Historic 19th century gold and silver mining sites are also found throughout the range. One of the most concentrated mining areas, Mineral Park, was also the Mohave County seat from 1877 to 1887. This area also has good potential for public use development.

RECREATION MANAGEMENT

The resource area offers a wide variety of topography, terrain features, vegetation, scenic values, historic resources, wildlife, wilderness and riparian resources. These all combine to make the region extremely valuable for such recreational pursuits as camping, backpacking, hiking, off-highway vehicle use, picnicking, hunting, photography, rockhounding, horseback riding and swimming. Visitors wishing to enjoy a recreation experience on the public lands may choose from primitive and unconfined activities to camping in developed campgrounds.

Much of the public lands in the resource area are remote and provide excellent opportunities for solitude and primitive camping and

backpacking. **Nine wilderness areas are within the resource area and provide unlimited opportunities for primitive recreation.**

The Kingman Resource Area is in a transition between the Basin and Range and the Colorado Plateau physiographic provinces. The Black, Cerbat, Hualapai, McCracken and Aquarius mountains trend north and south with long, linear valleys in between. The area contains many scenic features such as the Grand Wash Cliffs, Cerbat Pinnacles, Mount Nutt, Hualapai Mountains, Burro Creek Canyon and Aubrey Peak. A number of geologic formations are highly mineralized, resulting in spectacular scenery.

Vegetation communities are as diverse as the topography, soils and elevations. The area is in a transition zone between the Sonoran Desert to the south and the Mohave Desert to the north. Saguaro cactus and ocotillo can be seen intermixed with Mohave yucca and juniper in the region surrounding Burro Creek. Desert scrub vegetation (creosote bush, yucca and bursage) grows in the valleys and on the lower mountains and foothills of higher mountain ranges. Grasslands occur at mid-elevations such as the Hualapai Valley, Cherokee Point and Goodwin and Bozarth mesas. Juniper woodland occurs in the foothills of the Hualapai Mountains and at higher elevations in the Black, Cerbat, Music and Aquarius mountains. Pinyon is intermixed with juniper in the higher elevations of the Music, Cerbat, Hualapai and Aquarius mountains. Chaparral is found on the Hualapai Mountains as well as ponderosa pine, oak woodland and spruce-fir at the highest elevations. Riparian vegetation such as cottonwood and willow grows along perennial streams and around springs and seeps.

The lower elevations provide excellent recreation opportunities during the cooler months, the mid-elevations are used by visitors in the spring and fall and the higher elevations are used extensively in the spring, summer and fall. The diverse vegetation provides a variety of scenery, supports a variety of wildlife and offers a broad range of camping and photography experiences.

The area is highly mineralized and was mined by the early Spanish explorers and later European settlers since the 1860s. Many of the mountain areas contain a rich historical heritage of mining equipment, mine portals and buildings. Chloride, Oatman, Gold Road, Gold Basin and Mineral Park were early mining districts and towns, now important to people interested in history and photography. The mining industry has built an intricate network of roads and trails, which are now extensively used by off-highway vehicle enthusiasts and as access for hunters, campers and day-use visitors.

Water is a valuable resource in the arid Southwest. Several important riparian areas such as Wright and Burro creeks and the Big Sandy, Santa Maria and Bill Williams rivers provide excellent habitat for desert fisheries and wildlife. These areas also provide excellent recreation opportunities for hunting, camping, picnicking, swimming and photography.

The diverse topography, soils, vegetation and elevations provide excellent habitat for diverse wildlife species, including deer, elk, antelope, bighorn sheep, javelina, coyote, mountain lion, bald eagle, black-hawk and peregrine falcon. These species are important for hunting, photography and observation.

The Kingman Resource Area has four developed campgrounds.

Burro Creek, along Highway 93, provides facilities for recreation vehicles as well as for campers. Wild Cow, Windy Point and Packsaddle campgrounds offer a more remote camping experience and are also suitable for picnicking.

Visual Resource Management

The BLM is responsible for recognizing and protecting visual values on public lands. The Visual Resource Management system provides a way to qualify and quantify potential visual impacts to an acceptable level, helping managers make resource allocation decisions.

The BLM administers visual resources on public lands according to four Visual Resource Management classes. Table 25 shows the total acreages by class of inventoried public and nonpublic land that a recent inventory has yielded.

Table 25
Visual Resource Class Objective Acreages

Class	Acreage
VRM Class I Objectives	392,843
VRM Class II Objectives	882,491
VRM Class III Objectives	781,928
VRM Class IV Objectives	3,284,344
Total	5,341,606

WILDERNESS RESOURCES

With the passage of the Arizona Desert Wilderness Act of 1990 (Public Law 101-628, dated November 28, 1990), Congress designated some 1.1 million acres of BLM-administered public land in Arizona as wilderness. Nine separate wilderness areas, totaling over 390,000 acres, are located within the Kingman Resource Area. These wilderness areas are Mount Wilson, Mount Nutt, Warm Springs, Mount Tipton, Wabayuma Peak, Aubrey Peak, Upper Burro Creek, Arrastra Mountain and Rawhide Mountains. In two areas, the Rawhide Mountains and Arrastra Mountain, portions of the wilderness areas lie outside the planning area.

The Arrastra Mountain Wilderness is the largest of the BLM-managed wilderness areas in Arizona. Its size, diversity of plant and animal life and riparian environment make this area a truly exceptional natural area. This wilderness contains a unique blend of Sonoran and Mohave desert vegetation and provides habitat for nearly 300 species of wildlife. Topography is varied, with the Poachie Range rising to nearly 5,000 feet elevation. The western and southern portions of the wilderness contain more than 20 miles of the Big Sandy and Santa Maria rivers which, with their lush vegetation, provide sharp contrast to the surrounding desert vegetation.

The Aubrey Peak Wilderness contains a splendid variety of landforms and features. This volcanic area contains buttes, dikes, plugs, natural windows, caves, spires, overhangs and slickrock terraces. With elevations ranging from 1,800 feet to 3,221 feet, the wilderness offers a challenge to experienced

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hikers, as well as less strenuous stretches of desert washes and interior basins.

The Mount Nutt Wilderness, just west of Kingman, is an area of complex and fascinating terrain. Prominent buttes and mesas are cut by deep canyons and washes that provide excellent opportunities for solitude. The craggy peaks and canyons are awash in colors ranging from deep pink to brown. The area is also rich in archaeological resources, most notably Bighorn Cave, and provides important habitat for desert bighorn sheep.

The Mount Tipton Wilderness, within the Cerbat Mountain Range, has an elevation rising to 7,148 feet at the summit of Mount Tipton. The Cerbat Pinnacles are a major geologic attraction in the area, and hiking to the peak of Mount Tipton is becoming increasingly popular.

The Mount Wilson Wilderness borders the Lake Mead National Recreation Area southeast of Hoover Dam. Its isolation, ruggedness and lack of human development make this area one of the most pristine in the resource area. With a vertical relief of over 3,000 feet, visitors can experience breathtaking views of the Grand Canyon, Lake Mead and distant mountains in Nevada.

The Rawhide Mountains Wilderness is bisected by the Bill Williams River. The portion north of the river is in the Kingman Resource Area and the southern portion is in the Lower Gila Resource Area. Elevations range from 1,730 feet to 2,430 feet. The Rawhide Mountains contain many rugged outcroppings and canyons, creating a wide variety of landscapes. The 600-foot gorge of the Bill Williams River is a favorite of hikers.

The Upper Burro Creek Wilderness is considered by many to be the "crown jewel" of wilderness areas in Arizona. Few other areas combine the scenic, recreational and wildlife resources found in this wilderness. Burro Creek is a perennial stream that often runs deep, creating beautiful waterfalls and pools. The creek has cut a steep and rocky canyon through the landscape that provides striking colors and interest to the area.

The Warm Springs Wilderness, in the southern portion of the Black Mountains, provides important habitat for desert bighorn sheep. The area is quite large (over 113,000 acres), so opportunities for solitude are outstanding.

The Wabayuma Peak Wilderness, within the Hualapai Mountains, provides opportunities for year-round recreation use. Elevations of up to 7,160 feet provide cooler summertime temperatures than most other BLM-managed wilderness. Vegetation in this area ranges from a mixture of Sonoran and Mohave desert vegetation at the lower elevations to chaparral and ponderosa pine at the higher elevations. Its ruggedness and vegetative diversity provide major attractions to wilderness visitors.

A wilderness management plan will be prepared for each wilderness area. Implementing these plans will begin immediately upon their final approval and will be ongoing throughout the life on this RMP, regardless of the alternative selected. Wilderness study areas not designated as wilderness have been returned to multiple use and each individual activity will be managed in accordance with specific provisions of the Plan and Record of Decision signed by the BLM Arizona State Director.

WILD AND SCENIC RIVERS

Eligible River Segments

Rivers within the resource area were analyzed in accordance with the Wild and Scenic Rivers Act, December 23, 1980 and Information Memorandum numbers 87-615 (July 23, 1987) and 88-670 (September 8, 1988) to determine their eligibility to be studied for inclusion in the National Wild and Scenic Rivers System (see Table 2). The Bill Williams, Big Sandy and Santa Maria rivers and Burro, Francis and Wright creeks (as shown on Map 8) were determined to meet the eligibility requirements of being "free-flowing" and to have one or more "outstandingly remarkable" values.

The outstandingly remarkable values for each eligible river segment are described below.

Burro Creek (Segment A)

Outstandingly remarkable values: This portion of Burro Creek contains outstanding scenic qualities, including riparian vegetation, cliffs and undeveloped shorelines uncluttered by human development. The scenic quality of this portion is rated as Class A (see BLM Manual 8400). The narrow canyon and clear, deep pools of Burro Creek offer exceptional scenery. Rugged landforms, riparian vegetation and water combine to provide a variety of scenery unmatched within the resource area.

Outstanding opportunities for recreation also exist along this portion. This part of Burro Creek, within the Upper Burro Creek Wilderness, attracts visitors seeking outstanding opportunities for hiking, backpacking, photography, hunting, wildlife observation and sightseeing within the river corridor.

The entire stretch of Burro Creek, including this segment, provides habitat for a wide variety of unique wildlife. Species include 14 federal-, state- and BLM-sensitive species such as the bald eagle, Mexican black-hawk, zone-tailed hawk and the round-tailed chub. The riparian habitat associated with this area supports a great diversity of birds of prey.

The westernmost known occurrence of multi-storied, stone masonry pueblos constructed by the Prescott Culture in A.D. 1200 is along this segment of Burro Creek. Several historic and prehistoric peoples used this area together. It was a major source of obsidian for construction of tools, and many petroglyphs can be found within the river corridor.

Burro Creek (Segment B)

Outstandingly remarkable values: This portion of Burro Creek contains outstanding scenic qualities, including riparian vegetation, cliffs, and shorelines essentially natural in appearance. The canyon walls and the pools and riffles of Burro Creek provide a contrast in color and landform to make this stretch highly scenic.

The scenic quality of this portion is rated as Class A (see BLM Manual 8400).

The entire stretch of Burro Creek, including this segment, provides habitat for a wide variety of unique wildlife. Species include 14 federal-, state- and BLM-sensitive species such as the bald eagle, Mexican black-hawk, zone-tailed hawk and round-tailed chub. The riparian habitat associated with this area supports a great diversity of birds of prey.

Burro Creek (Segment C)

Outstandingly remarkable values: This portion of Burro Creek contains outstanding scenic qualities, including riparian vegetation, cliffs and shorelines uncluttered by human development. Numerous volcanic features, including basalt and rhyolite cliffs and canyons, are within this area. The scenic quality of this portion is rated as Class A (see BLM Manual 8400).

Outstanding opportunities for recreation exist within this stream corridor. The ruggedness of the canyon and the presence of perennial water provide outstanding backpacking and hiking opportunities. The corridor also provides outstanding wildlife viewing and photography opportunities.

The entire stretch of Burro Creek, including this segment, provides habitat for a wide variety of unique wildlife. Species include 14 federal-, state- and BLM-sensitive species such as the bald eagle, Mexican black-hawk, zone-tailed hawk and round-tailed chub. The riparian habitat associated with this area supports a great diversity of birds of prey.

Burro Creek (Segment D)

Outstandingly remarkable values: This portion of Burro Creek contains outstanding scenic qualities, including riparian vegetation, cliffs and undeveloped shorelines. The color of the various rock formations combines with the riparian vegetation and the appeal of the creek itself to provide a most interesting and diverse landscape. The scenic quality of this portion is rated as Class A (see BLM Manual 8400).

The entire stretch of Burro Creek, including this segment, provides habitat for a wide variety of unique wildlife. Species include 14 federal-, state- and BLM-sensitive species such as the bald eagle, Mexican black-hawk, zone-tailed hawk and round-tailed chub. The riparian habitat associated with this area supports a great diversity of birds of prey.

Burro Creek (Segment E)

Outstandingly remarkable values: This portion of Burro Creek contains outstanding scenic qualities, including riparian vegetation, cliffs and undeveloped shorelines uncluttered by human development. The scenic quality of this portion is rated as Class A (see BLM Manual 8400). Rugged landforms, riparian vegeta-

tion and water combine to provide a variety of scenery.

Outstanding opportunities for recreation exist within this stream corridor. The ruggedness of the canyon and the presence of perennial water provide outstanding backpacking and hiking opportunities. The corridor also provides outstanding wildlife viewing and photography opportunities.

The entire stretch of Burro Creek, including this segment, provides habitat for a wide variety of unique wildlife. Species include 14 federal-, state- and BLM-sensitive species such as the bald eagle, Mexican black-hawk, zone-tailed hawk and round-tailed chub. The riparian habitat associated with this area supports a great diversity of birds of prey.

Francis Creek

Outstandingly remarkable values: Francis Creek contains outstanding scenic qualities, including riparian vegetation, cliffs and undeveloped shorelines. The scenic quality of this portion is rated as Class A (see BLM Manual 8400). Rugged landforms, riparian vegetation and water combine to provide an exceptional scenery.

Francis Creek provides habitat for a wide variety of unique wildlife. Species include 14 federal-, state- and BLM-sensitive species such as the bald eagle, Mexican black-hawk, zone-tailed hawk and round-tailed chub. Francis Creek supports a predominantly native fishery, a rare and important occurrence in southwestern streams. Francis Creek is a tributary to Burro Creek and maintains a significant source of perennial water flow into Burro Creek.

Big Sandy River (Segment A)

Outstandingly remarkable values: This segment of the Big Sandy River is an important desert riparian ecosystem. The segment provides important habitat for non-game birds, fish, other wildlife and insect populations. This river is an important stopover area for migrating non-game birds. The riparian area provides winter habitat for bald eagles, a federally listed endangered species, and could significantly contribute to a nucleus of bald eagles capable of recolonizing the Colorado River.

Big Sandy River (Segment B)

Outstandingly remarkable values: This segment of the Big Sandy River contains outstanding scenic qualities. Landforms of broad river channels, high banks and rolling hills combine with dense riparian vegetation and the appeal of moving water to provide a most interesting scenic resource. The scenic quality of this portion is rated as Class A (see BLM Manual 8400).

Outstanding opportunities for primitive recreation also exist within this segment. Most of this segment is within the Arrastra Mountains Wilderness and has the potential to be one of the main

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backpacking travel routes within the wilderness. Other exceptional opportunities include wildlife observation, nature study and photography.

This segment of the Big Sandy River is an important desert riparian ecosystem. The segment provides significant habitat for bird, fish, other wildlife and insect populations. This segment is an important stopover area for migrating non-game birds and waterfowl. The riparian area provides winter and breeding habitat for bald eagles, a federally listed endangered species, and could significantly contribute to a nucleus of bald eagles capable of recolonizing the Colorado River.

Santa Maria River (Segment A)

Outstandingly remarkable values: This segment of the Santa Maria River contains outstanding scenic qualities. The narrow river gorge with numerous deep side canyons and escarpments provides a striking contrast to the surrounding mountains. The presence of perennial water and riparian vegetation creates a dramatic green belt which enhances the overall scenic quality of the area, rated as Class A (see BLM Manual 8400).

Outstanding recreation opportunities exist along this river segment. Backpacking and hiking opportunities are superb along the river and its many side canyons. This portion of the river is in the Arrastra Mountain Wilderness and has the potential to be the major destination point for most visitors to the wilderness area.

This segment of the Santa Maria River is an important desert riparian ecosystem. The segment provides significant habitat for bird, fish, other wildlife and insect populations. The riparian area provides wintering and breeding habitat for bald eagles and potential habitat for breeding peregrine falcons. This particular area could significantly contribute to bald eagles recolonizing the Colorado River.

Santa Maria River (Segment B)

Outstandingly remarkable values: This desert riparian ecosystem provides important habitat for bird, fish, other wildlife and insect populations. The riparian area provides wintering habitat for bald eagles. This particular area could significantly contribute to bald eagles recolonizing the Colorado River.

Bill Williams River (Segment A)

Outstandingly remarkable values: This segment of the Bill Williams River contains outstanding scenic qualities. The river gorge is narrow with numerous deep side canyons. Perennial water and riparian vegetation create a dramatic oasis which enhances the overall scenic quality of the area. The scenic quality of this portion is rated as Class A (see BLM Manual 8400).

Outstanding recreation opportunities exist along this river segment. Backpacking and hiking opportunities are superb along

the river and its many side canyons. This portion of the river is in the Rawhide Mountain Wilderness and has the potential to be a major destination point for visitors to the wilderness area.

This segment of the river is part of one of the most important desert riparian ecosystems in the state of Arizona. The segment provides important habitat for numerous species of wildlife and fish. High primary productivity has produced an abundance of non-game birds, amphibians, reptiles and mammals. The riparian area provides wintering and breeding habitat for bald eagles and potential habitat for breeding peregrine falcons. This particular area could significantly contribute to bald eagles recolonizing the Colorado River.

Bill Williams River (Segment B)

Outstandingly remarkable values: This segment of the river is part of an important desert riparian ecosystem. The segment provides crucial habitat for bird, fish, other wildlife and insect populations. The riparian area provides wintering and breeding habitat for bald eagles and potential habitat for breeding peregrine falcons. This particular area could significantly contribute to bald eagles recolonizing the Colorado River.

Wright Creek

Outstandingly remarkable values: This is a perennial stream providing habitat for an atypical strain of the longfin dace (*Agosia chrysogaster*). This stream is isolated from other watercourses within the resource area which support fish populations.

The area contains a diverse and unique blend of prehistoric and historic resources. The first ranching homesteads south of the Colorado River in Mohave County were established in the general area in the 1870s. In contrast, the area contains numerous sites of the Cohonina Culture dating from about A.D. 700 to 1500. The western Cohonina sites have never been studied. The area is also near the present-day Hualapai Reservation and probably contains historic Pai sites, which might help answer questions concerning their origin and development.

Ineligible River Segments

The following segments of rivers were considered for inclusion in the National Wild and Scenic Rivers system but were considered ineligible.

Big Sandy River

Segment Description: The Big Sandy River segment from its headwaters at the confluence of Trout and Knight creeks downstream to Highway 93 at the Big Sandy bridge was determined to be ineligible because of the lack of outstandingly remarkable values.

Cottonwood Creek

Segment Description: This segment from its headwaters in the Cottonwood Cliffs downstream to where it empties into Truxton Wash was determined to be ineligible because it is not free-flowing.

WILDLIFE HABITAT MANAGEMENT

The Kingman Resource Area's wildlife habitat management program is guided by the objectives and goals of a bureauwide policy document entitled Fish and Wildlife 2000. The accomplishment of such goals and objectives is achieved principally by the development of wildlife activity plans known as habitat management plans. Five plans have been developed covering the entire resource area. These documents include detailed descriptions of wildlife resources, resource conflicts and proposed projects, goals and objectives.

Five major components of the wildlife habitat management program are unique wildlife habitats, general wildlife habitat, big game, resource conflicts with wildlife and wildlife habitat improvement projects.

Unique Wildlife Habitats

Wildlife inventories have found 20 standard habitat sites. These habitats are specified and discussed in the Hualapai-Aquarius Grazing Environmental Impact Statement and associated documents. Similar standard habitat sites occur in the Cerbat/Black Mountain Environmental Impact Statement area.

The predominant vegetative types in the Cerbat and Black Mountains planning units are described in their respective habitat management plans. The standard habitat site methodology used in the Hualapai-Aquarius Grazing Environmental Impact Statement had not been developed when planning for these areas was undertaken.

Habitat types especially important to wildlife are ponderosa pine-Gambel's oak, ponderosa pine-mixed conifer and cottonwood-willow riparian.

Common standard habitat types are important in sustaining wildlife resources such as small and big game populations and common birds and reptiles.

The extremely limited riparian and "mountain island" habitats provide habitat for a wealth of wildlife species, including rare, threatened and endangered species, as well as big game and other common wildlife.

Because of their rarity in the resource area and their critical importance to wildlife, management attention is often focused on these unique wildlife habitat areas, concentrating on conservation and preservation of these resources.

General Wildlife Habitat

The BLM administers general habitat for wildlife management on a day-to-day basis by focusing on ecosystem management, seeking to maintain and enhance existing wildlife resources. The BLM manages for a diversity of plant and animal resources, assuring long-term viability of otherwise fragile desert ecosystems.

Although management attention often spotlights rare species and their habitats, continuous efforts are made to ensure the health and productivity of all wildlife habitats, including widespread habitat types such as chaparral, saguaro-paloverde and creosote-bursage.

Big Game

Big game species are an important aesthetic and economic resource. Key big game species are listed in Table 26. The management of big game habitat is a cooperative effort between the BLM and the Arizona Game and Fish Department. Information on quality and amount of big game habitats, existing and future population targets and population trends is presented in existing management framework plans, habitat management plans and the Arizona Game and Fish Department Big Game Strategic Plan and annual big game surveys. Herd management plans are periodically revised to incorporate new information, including updates in the status of big game populations, habitat improvement projects, transplant proposals and habitat monitoring efforts.

The Black Mountains contain one of Arizona's outstanding herds of desert bighorn sheep. These animals have been used in studies and to reestablish sheep herds in regions where they have been extirpated. They also provide some of Arizona's best bighorn sheep hunting. Bighorn also inhabit the extreme southern part of the Hualapai Planning Unit near Aubrey Peak, the Casteneda Hills and the McCracken and Rawhide mountains. This isolated herd has recently been bolstered by supplemental transplants from the Black Mountain herd (see Map 33). Bighorn have been extirpated from portions of the Aquarius Planning Unit, especially the upper Bill Williams drainage.

Pronghorn antelope also occur in the resource area. The herds in the Truxton area and on Goodwin Mesa have viable numbers, and herd management plans have proposed projects to further improve their habitat.

Mule deer are found throughout the resource area, but are concentrated in the Hualapai, Cerbat and Music mountains. These and other areas provide ample opportunities for hunters, photographers and sightseers.



Javelina have been introduced into several locations, primarily in the Hualapai Mountains and the Burro Creek drainage. These transplants have been successful and javelina are now common throughout the Hualapai Mountains and along the upper Bill Williams watershed, including Burro Creek, Alamo Lake and the Big Sandy River.

In the future, to achieve an ecological balance in areas used by wildlife and other ungulates, forage would be allocated to all ungulates in an equitable ratio.

Resource Conflicts

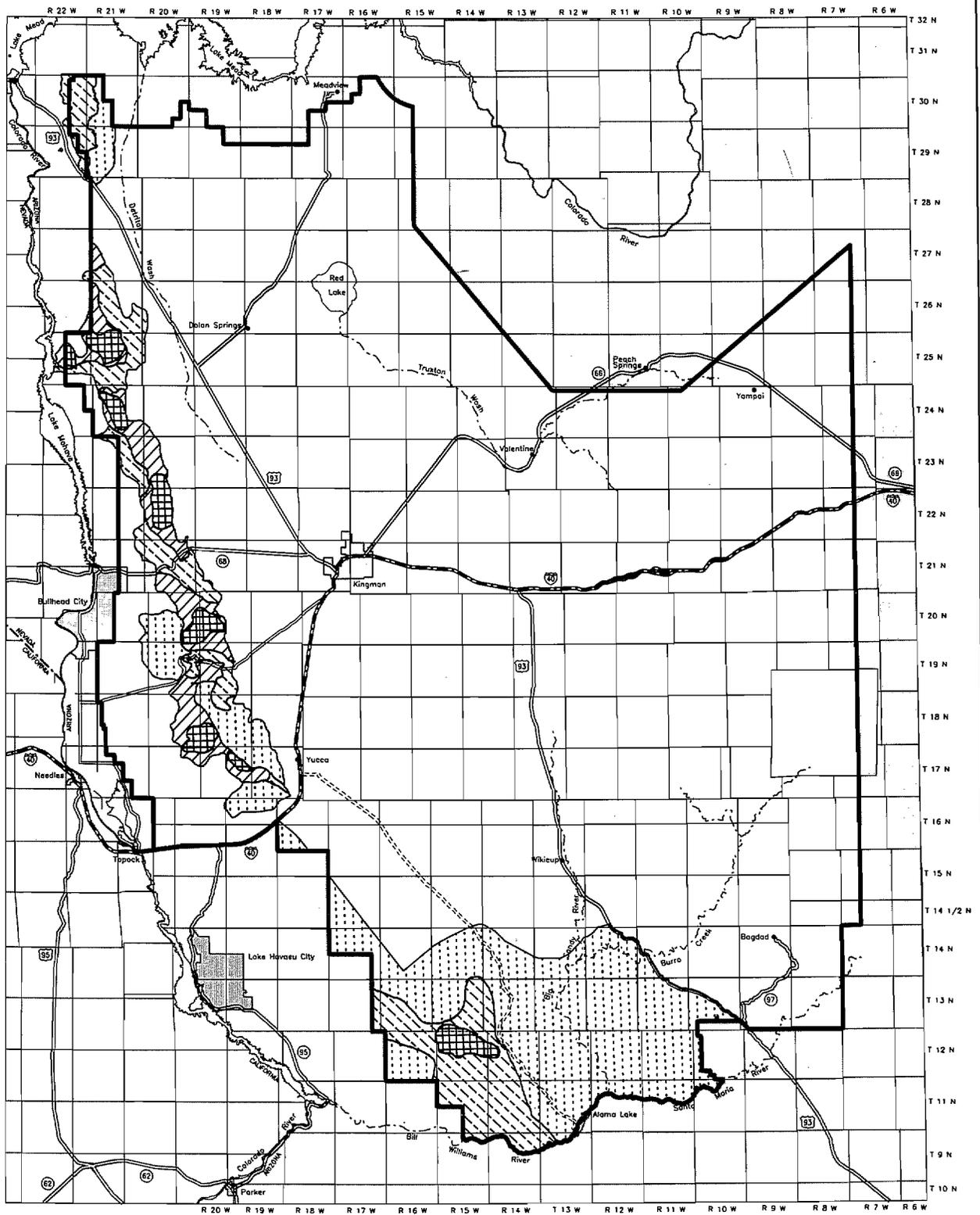
Plant and animal resource conservation efforts conflict with some

**Table 26
BIG GAME SPECIES**

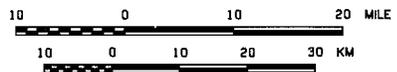
COMMON NAME (Scientific Name)	General Distribution in Arizona	Suitable Habitat on Public Lands	Remarks
Desert bighorn sheep (<i>Ovis canadensis nelsoni</i>)	Southern and northwestern Arizona	Black Mountains	One of Arizona's premier naturally occurring bighorn sheep herds. Extensive investment of and money by resource agencies and concerned public.
		Mount Wilson	Primarily a ram area next to good sheep habitat on the Lake Mead National Recreational Area.
		Aubrey Peak Complex	Southern Mohave County complex of several "mountain islands" used by bighorn sheep. Recently, sheep have been transplanted into this population to try to boost the region's low densities.
Pronghorn (<i>Antilocapra americana</i>)	Temperate grasslands of southeastern and northern Arizona, the Great Basin desertscrub of northern Arizona and the Sonoran desertscrub on the Cabeza Prieta Game Range	Grassland communities on Goodwin Mesa, in Hualapai Valley, Truxton and Dutch Flat	Goodwin Mesa and Truxton areas provided the Kingman Resource Area's most important habitat. Private and state lands in Round Valley provide important habitat next to public lands.
Mule deer (<i>Odocoileus hemionus</i>)	Boreal forests of Kaibab Plateau, San Francisco Peaks and White Mountains to creosote-bursage communities of the Sonoran Desert	All plant communities throughout the Basin and Range portion of the Kingman Resource Area provide habitat; densities range from sparse to high	Areas of blocked lands contribute significantly, sustaining local populations (medium to high densities) in the Hualapai, Cerbat, Music and Aquarius mountains.
Elk (<i>Cervus canadensis</i>)	Introduced into Arizona, now throughout much of the Mogollon Rim and the Hualapai Mountains	Remnant herd persists in the Hualapai Mountains; occasional dispersal into the Cerbat and Peacock mountains	Hualapai herd is nonnative, introduced in the 1920s.
Javelina (<i>Dicotyles tajacu</i>)	Throughout central, south-central and southeast Arizona, especially in riparian desert-scrub habitats	All plant communities in the Basin and Range portion of the resource area provide habitat; densities vary from sparse to high	The present javelina population is the result of introductions which were especially successful in the Hualapai Mountains and Burro Creek.

Source: Arizona Game and Fish Commission, Arizona Game and Fish Department. "Big Game Strategic Plans 1980-83" 1980. Phoenix, Arizona

BIGHORN SHEEP HABITAT



-  LAMBING GROUNDS
-  HIGH VALUE HABITAT
-  MEDIUM VALUE HABITAT
-  LOW VALUE HABITAT



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uses but are in harmony with others. Wilderness and cultural resource values and prescribed burning are generally harmonious with wildlife conservation.

Other resource uses (mineral exploration and development, grazing and off-highway vehicles) usually require intensive evaluation and coordination to avoid adverse impacts to wildlife. Frequently, adverse impacts are unavoidable and can only be partly offset by mitigation.

There is concern over fragmentation of wildlife habitats and the perpetuation of wildlife habitat islands surrounded by human development and encroachment. Such fragmentation of wildlife habitats restricts necessary wildlife movements, diminishing the potential for long-term maintenance of biodiversity, viable populations and interactions among species. The loss of movement corridors leads to isolation, which can result in inbreeding, loss of reproductive ability and ultimately extinction.

The rapid growth of human populations often precludes consideration of wildlife and their movement needs. Highway 68 is known to have already eliminated movement of bighorn sheep between the northern and southern Black Mountains. Road development, increased traffic and urban encroachment block natural movement corridors, may result in "death traps" for wildlife and more importantly lead to the ultimate genetic isolation of wildlife populations.

Wildlife Habitat Improvement Projects

A major part of the Kingman Resource Area's wildlife program involves the development of wildlife habitat improvement projects. These include spring developments, rainwater catchments, enclosures, fence modifications, prescribed burns and tree plantings.

SPECIAL STATUS SPECIES MANAGEMENT

Special status species include federally listed and proposed species, federal candidate species, state-listed threatened species and sensitive species. Eighteen plant and 33 animal special status species may occur in the Kingman Resource Area, as listed in Appendix 6. Of the animals, 22 species are either historic, unverified, only transient on public land or are known to occur only on nonfederal land. The BLM manages significant habitat for bald eagle, peregrine falcon, Hualapai Mexican vole, desert tortoise, ferruginous hawk, black-hawk, roundtail chub, spotted owl, leopard frog, northern goshawk, Arizona cliffrose, white-margined penstemon, Cerbat beard-tongue, Welsh phacelia and *Aquarius milkvetch*.

The resource area contains both Mohave and Sonoran desert habitat for the desert tortoise. Habitat classifications are shown in Map 34. The Mohave Desert habitat is limited to extensive mesas and steep talus slopes of the Black Mountains. Vegetation is predominantly Mohave desert shrub, represented by several plant communities, including creosote and yucca associations. Tortoises most typically use the washes in the foothill regions and the bajadas. Washes are crucial to tortoise survival in the Black Mountains because of a lack of suitable cover elsewhere.

Tortoise populations in the Sonoran Desert occupy boulder-strewn

hillsides and Sonoran desert scrub vegetation with scattered interior chaparral biotic communities. South-facing slopes are typically occupied by saguaro, paloverde, teddybear cholla, ocotillo, nolina, canotia, beavertail cactus and narrowleaf yucca.

Seven federally listed, proposed and candidate plant species are either known to occur or could occur in the resource area. These species are shown in Appendix 6.

The state of Arizona's Natural Heritage Program also maintains a list of plant species which have been recommended for sensitive designation to the BLM (see Appendix 6).

RIPARIAN AREA MANAGEMENT

Among the most productive and important ecosystems, riparian areas make up less than one percent of the public lands. Characteristically, riparian areas display a greater diversity of plant, fish, wildlife and other animal species and vegetative structure than adjoining ecosystems. Healthy riparian systems filter and purify water as it moves through the riparian zone, reduce sediment loads and enhance stream bank stability, provide microclimate moderation when contrasted to extremes in adjacent areas and contribute to groundwater recharge and base flow.

At least 465 miles of potential riparian habitat have been identified. Appendix 7 shows riparian areas, mileages and associated reference maps. The mileages include public, private and state lands. Of the 225 miles inventoried, 60 percent is in unsatisfactory condition and 40 percent is in satisfactory condition.

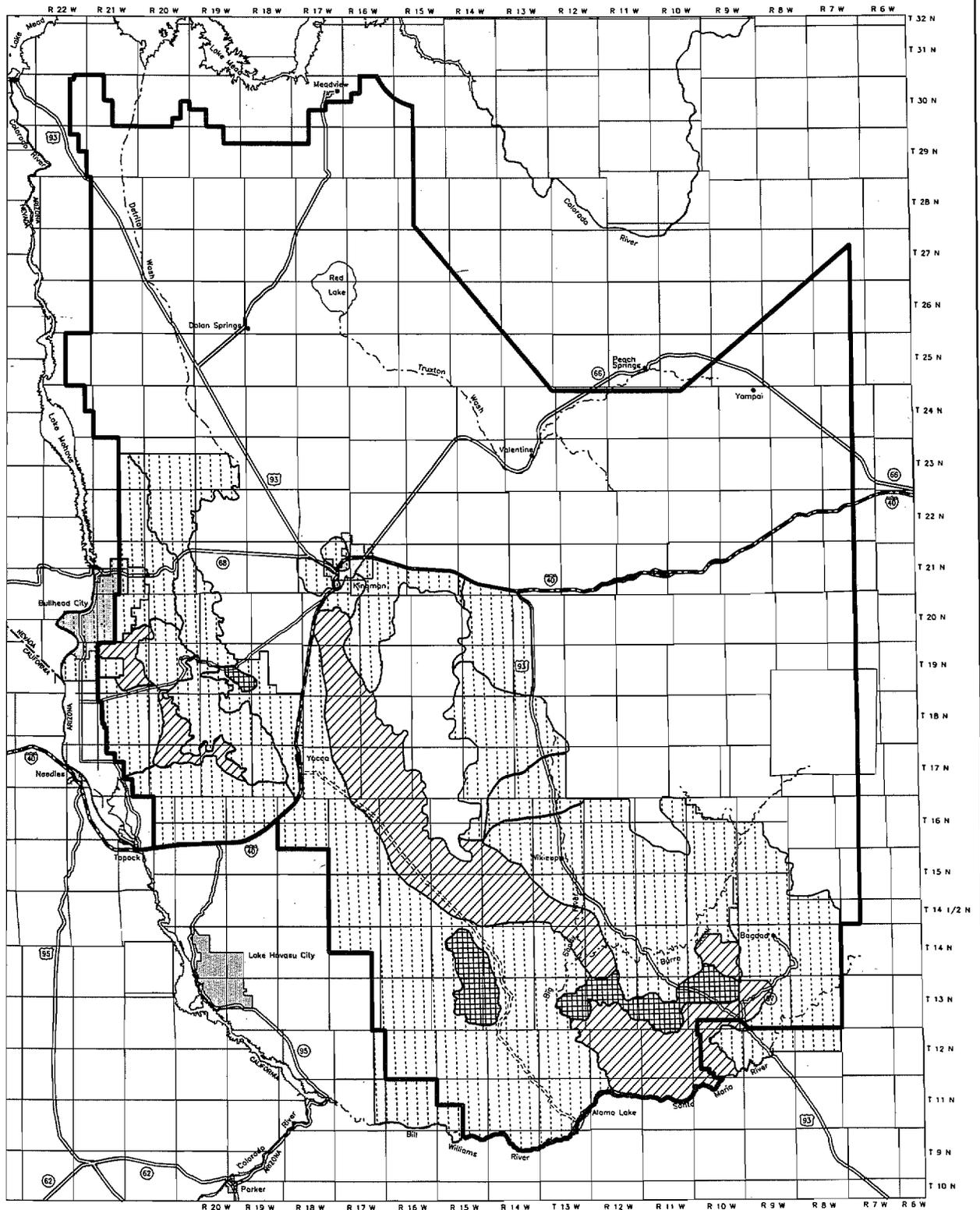
The best developed and most extensive riparian deciduous forest communities on public lands occur along the upper Bill Williams watershed (Burro Creek, Francis Creek, Big Sandy River, Santa Maria River), the Bill Williams River, Sycamore Creek, Wright Creek and smaller creeks in the Hualapai Mountains. Perennial surface flows are most commonly found along these drainages, making them the most valuable and highest potential riparian areas. They make up 165 miles of the total of 502 miles of riparian areas. Elsewhere in riparian deciduous, trees grow most often in small clusters or as scattered individuals interspersed with riparian scrub vegetation.

Dominant trees in these riparian deciduous forest communities are cottonwood, willow, sycamore, ash, alder, walnut and netleaf hackberry. Dominant trees and shrubs found in riparian scrub communities include salt cedar, seep willow and squaw baccharis.

WILD AND FREE-ROAMING HORSE AND BURRO MANAGEMENT

The Wild and Free-Roaming Horse and Burro Act became law on December 15, 1971, authorizing the BLM's management of wild horses and burros on public land. This provided that wild and free-roaming horses and burros be protected from unauthorized capture, branding, harassment or death, and considered wild horses and burros an integral part of the natural system based upon their 1971 distribution. The resource area has three wild horse and burro herd management areas (see Map 10).

DESERT TORTOISE HABITAT CATEGORIES



-  CATEGORY I TORTOISE HABITAT
-  CATEGORY II TORTOISE HABITAT
-  CATEGORY III TORTOISE HABITAT



Black Mountains Herd Management Area

The Black Mountains Herd Management Area is in the Black Mountains and the associated valleys to the east and west. The Black Mountains wild burro herd is the largest wild burro herd on public lands. The herd management area is nearly 20 miles wide at its widest point and extends nearly 100 miles from Interstate 40 on the south to Hoover Dam on the north (see Table 27). To achieve a thriving ecological balance in joint use areas, forage would be allocated to all ungulates in an equitable ratio.

A viable population limit for wild burros is presently unknown. The Black Mountains Herd Management Area Plan became effective in 1981. The Black Mountains Herd Management Area contains an estimated 890 burros.

Big Sandy Herd Management Area

South of Wikieup, the Big Sandy Herd Management Area includes lands along the Big Sandy River and Burro Creek. The herd management area is bordered by the Alamo Herd Management Area to the south and extends east to the confluence of Copper Creek and Burro Creek and from one to ten miles west of the Big Sandy River in a Sonoran Desert habitat (see Table 27). The Big Sandy Herd Management Area Plan had initially set a population of 139 wild burros as the population level in an ecological balance with their habitat.

The Big Sandy Herd Management Area Plan was implemented in 1983. A population inventory is planned for the fall of 1993 to determine an accurate population estimate.

Cerbat Herd Management Area

The Cerbat Herd Management Area is north of Kingman in the Cerbat Mountains. The herd management area is roughly 20 miles long and 16 miles wide. Horses occur on both sides of the main ridge line of the Cerbat Mountains. Cherum Peak is the focal point for the horse population.

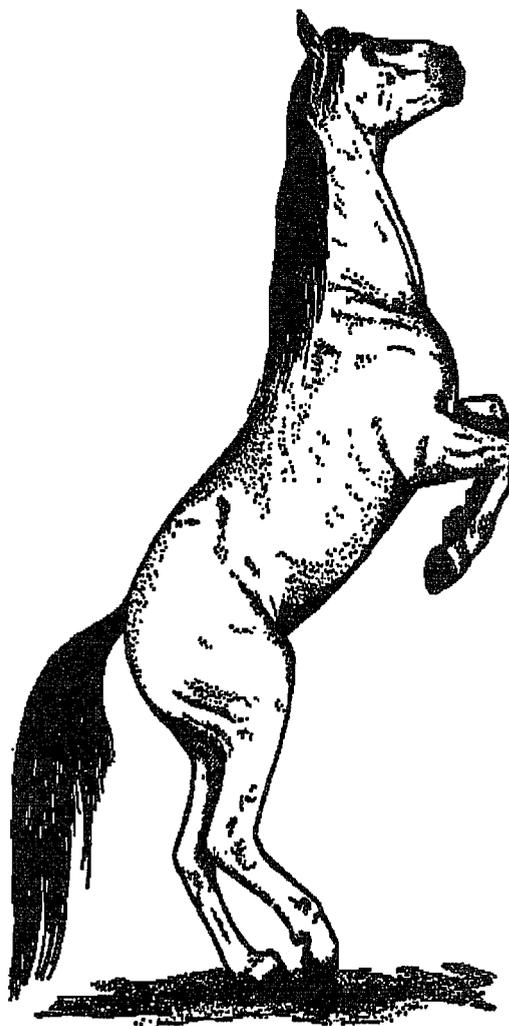
The Cerbat/Black Mountain Environmental Impact Statement proposed forage for 14 wild horses. An inventory of the wild horse population is scheduled for the fall of 1994 to determine an accurate population estimate.

Early genetic tests on a small sample of the horse population in the Cerbat Mountains found these animals to be unique. To preserve this uniqueness, a viable population level must be determined and maintained. To maintain a viable population, the BLM's Wild Horse and Burro Guidance (1983) suggests a minimum effective breeding population of 50 animals. A viable population could be maintained in an ecological balance by allowing for 50 effective breeding animals.

**Table 27
Acres Within Herd
Management Areas**

Herd Management Area	Public	Private	State	Total
Black Mtn.	586,533	225,554	25,296	837,383
Big Sandy	192,030	31,822	20,410	244,262
Cerbat	57,879	21,462	4,160	83,501
Total	836,442	278,838	49,866	1,165,146

Source: Kingman Resource Area Files



SOCIOECONOMIC FACTORS

Data from Mohave and Yavapai counties provide the basis for the descriptive material in this section. However, because the Kingman Resource Area covers only portions of these counties, much of the available socioeconomic data, aggregated on a county-wide range, is inappropriate. To adjust for this, the data, wherever possible, focus specifically on those portions of the counties included in the Kingman Resource Area.

Population

Population growth has been strong in Mohave and Yavapai counties through the decade of the 1980s. In 1980 the Mohave County population was 55,865; Yavapai County had a total of 68,145 people. By 1990 the Mohave County population had increased by 67 percent to a total of 93,497. Yavapai County gained 58 percent, totalling 107,714 by 1990. In comparison, the State growth rate from 1980 to 1990 was about 35 percent.

As Table 29 shows, the population of Mohave and Yavapai counties is measurably older than the state average. Yavapai residents are somewhat older than their Mohave neighbors. The proportion of persons under 18 years of age in Yavapai County also is smaller than in Mohave County.

**Table 29
AGE AND SEX DISTRIBUTION, 1990**

	Male	Female	Under 18 Yrs	Over 65 Yrs	Mean Age
Mohave	49.7%	50.3	22.6	20.6	40.7 yrs
Yavapai	48.9	51.1	21.5	23.8	42.4 yrs
State	49.4	50.6	26.8	13.1	32.2 yrs

Source: Selected Population and Housing Characteristics: Arizona, 1990, Bureau of the Census

Data on the characteristics of households reflect the population distribution statistics. As Table 30 indicates, nearly 13 percent of Yavapai County residents in households are persons over 65 years who live alone.

**Table 30
HOUSEHOLD CHARACTERISTICS, 1990**

	Married Couple Household	Other Couple Household	Non-Family Household	Over 65 Householder Living Alone
Mohave	61.6%	10.8	27.6	10.1
Yavapai	60.4	9.4	30.2	12.8
State	54.6	14.0	31.4	8.7

Source: Selected Population and Housing Characteristics: Arizona, 1990 Bureau of the Census

Information on birthrates per 1,000 population in 1988 shows the state average was 18.2 and the Mohave County average was 15.0. The Yavapai County birthrate was the lowest with 13.1 births per 1,000 residents. (Data source: Planning and Health Status Monitoring, Arizona Department of Health Services, January 1988).

Population and housing data for Arizona compiled in the 1990 census contain the following information.

1. Owners occupy about 71 percent of the housing units in Mohave and Yavapai counties. The state average, in contrast, is 64 percent.
2. The median value of the owner-occupied units varies from \$75,600 in Mohave County to \$84,500 in Yavapai County, while the state median value is reported to be \$80,400.
3. Median rental costs are higher in Mohave County (\$375) than in Yavapai County (\$342). The median rental cost in the state is \$370.
4. Forty-three percent of the housing units in Mohave County are mobile homes. In Yavapai County, 28 percent of the housing units are mobile homes. On a statewide basis, mobile homes constitute 17 percent of the housing units.

As shown in Table 31, there are distinct population centers in the two counties. Mohave County contains three: the Bullhead City, Kingman and Lake Havasu City areas. In Yavapai County, the Prescott area represents the major population center.

**Table 31
SELECTED AREAS: POPULATION**

	1980	1990
MOHAVE COUNTY		
Bullhead City	10,719	21,851
Chloride	250	500*
Desert Hills		1,700
Dolan Springs	800	1,090
Golden Valley		2,619
Kingman	9,257	12,722
Mohave Valley		6,962
New Kingman-Butler		11,627
Peach Springs	988	787
Willow Valley		355
Remainder of county	33,345	33,184
Total	55,359	93,497
YAVAPAI COUNTY		
Ash Fork	446	540
Bagdad	2,349	1,858
Seligman	510	670
Remainder of county	63,212	104,646
Total	66,517	107,714

*1989 Data

Source: Arizona State Data Center, Department of Employment Security Population Statistics Unit, Phoenix (1990 Census Data).

Population Projection

Estimates at both the county and community levels show a continuation of strong growth for the next half-century. Data shown in Table 32 for the state, counties and selected communities indicate the Arizona population will double by 2040. Mohave and Yavapai counties, and each of the communities tracked in the projections, will equal or better the statewide percentage increase.

Table 32
COUNTY/COMMUNITY POPULATION PROJECTIONS
(State and County Populations shown in Thousands)

	2000	2010	2020	2030	2040
ARIZONA	4,800.7	5,940.3	7,181.9	8,262.7	9,230.5
Mohave	126.6	167.3	212.4	256.0	298.8
Yavapai	138.9	180.9	227.0	270.8	312.6
Ash Fork	670	875	1,095	1,305	1,510
Bagdad	2,100	2,735	3,430	4,085	4,725
Bullhead City	34,905	46,125	58,560	70,580	82,380
Chino Valley	7,485	9,750	12,235	14,595	16,845
Jerome	620	805	1,015	1,210	1,395
Kingman	18,175	24,015	30,490	36,750	42,890
Seligman	800	1,040	1,305	1,560	1,800

Place is rounded to the nearest five.

State total is derived by addition of rounded county totals.

Source: Arizona Department of Economic Security, Office of the Director, June 1989. Table prepared by: Arizona Department of Economic Security, Population Statistics Unit.

Economic and Financial Factors

Information compiled by the Arizona Department of Economic Security indicates a relatively healthy employment pattern in Mohave and Yavapai counties.

Data in Table 33 show the percentages of employed persons in non-agricultural positions in Arizona, Mohave and Yavapai counties and three communities. Employment in the trade and service industries dominates the display.

The strong population growth in the two counties is reflected in the relatively high percentage of construction employment. On a statewide basis, some six percent of the employees are engaged in construction. But in Yavapai County construction involves about nine percent of the workers; in Mohave County almost ten percent of the employees are in construction.

The variance is highlighted by the data from the communities. Nearly 14 percent of the employees in Bullhead City are associated with construction. Much of this is related to casino and related activities in Laughlin, Nevada.

Table 34 displays average employment figures for 1990. Generally, unemployment in the population centers was lower than the county average. Bullhead City is the exception. Unemployment there, at 6.4 percent, was somewhat higher than the county average of 5.9 percent.

Data on personal income, shown in Table 35, show that transfer payments were a major source of income in both Mohave and Yavapai counties. Transfer payments are closely associated with retirees and consist primarily of income from Social Security and pensions. In Mohave County, transfer payments were the single largest source of income; in Yavapai County, only the dividends, interest and rent category exceeded transfer payments as a single income source. Transfer payments also constituted 25 percent of the total personal income in Mohave County. Yavapai County, in comparison, was 23 percent.

Table 33
EMPLOYMENT STRUCTURE: 1989 PERCENTAGES

	Bullhead City (80)	Kingman (88)	Mohave County (89)	Ashfork (88)	Yavapai County (89)	State (89)
Manufacturing	5.5	13.4	10.5	9.6	8.7	12.3
Mining/Quarry	.9	1.5	.2	3.6	3.3	.8
Construction	13.8	7.3	9.7	7.5	8.7	5.6
Transportation, communication, public utilities	12.0	5.4	4.8	3.8	3.9	4.7
Trade	21.9	27.8	31.5	26.8	27.6	25.1
Finance, insurance, Real Estate	5.5	4.5	4.7	4.2	3.8	6.2
Services/Miscellaneous	38.6	22.6	23.5	21.3	23.9	25.0
Government	1.4	17.5	13.9	22.7	19.1	17.7

Source: Community Profiles, Arizona Department of Commerce, 1990

Table 34
AVERAGE EMPLOYMENT

	Labor Force	Employment	Unemployment 1990	Unemployment 1989	Rate (%) 1990
MOHAVE COUNTY	37,511	35,286	2,225		5.9
Bullhead City					
Riviera	6,426	6,016	410	5.2	6.4
Kingman	6,734	6,347	387	4.7	5.7
Peach Springs (1989 data)	641	217	424	66.1	
Rest of county	23,710	22,706	1,004		
YAVAPAI COUNTY	40,429	38,552	1,940		4.8
Ash Fork/Seligman (1989 data)	792	770	22	2.8	
Bagdad	1,302	1,297	5		0.4
Rest of county	38,335	36,485	1,913		

Source: Arizona Department of Economic Security, Labor Force Information, January 1991

Wage and salary income constitutes a larger proportion of the Mohave County income than in Yavapai. In Mohave County, the wage and salary category represents 77 percent of the total income. In Yavapai County, this category amounts to about 72 percent. In contrast, the proprietor income category is larger in Yavapai County (22 percent) compared with 16 percent in Mohave County.

Approximately one million acres (12 percent) of the land in Mohave County is in private ownership. There are about 1,350,500 acres of privately owned lands in Yavapai County (26 percent).

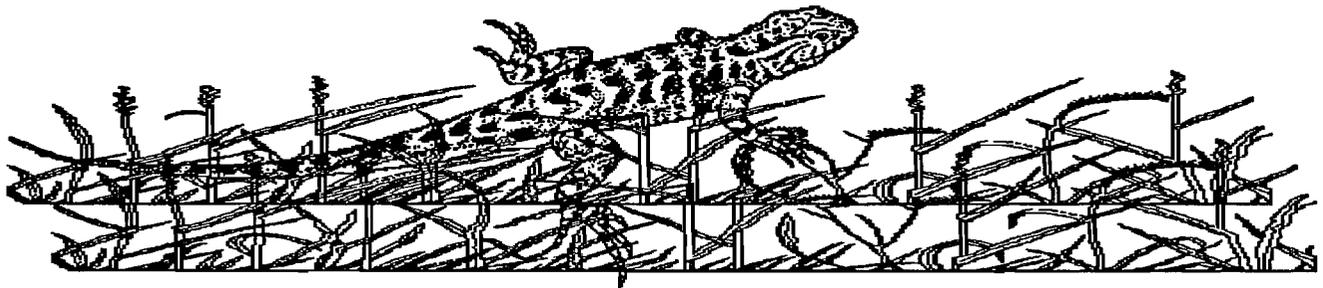


Table 35
PERSONAL INCOME BY MAJOR SOURCE: 1987

	MOHAVE COUNTY	YAVAPAI COUNTY
	(Data Shown in Thousands)	
Total Personal Income	872,731	1,156,410
Non-Farm Personal Income	869,437 (99.7)	1,139,522 (98.5)
Farm Income	3,294 (0.3)	16,888 (1.5)
Earnings by Place of Work	442,187	543,910
Social Security payments	-28,966	-34,572
Adjustment for Residence	44,073	29,468
Net Earnings by Place of Residence	457,294 (52.4)	538,806 (46.8)
Dividends, Interest, Rent	196,015 (22.5)	352,052 (30.4)
Transfer Payments	219,422 (25.1)	265,552 (23.0)
Earnings by Place of Work	442,187	543,910
Wage and Salary	341,108 (77.2)	392,132 (72.1)
Other Labor Income	31,539 (7.1)	34,584 (6.4)
Proprietor's Income	69,540 (15.7)	117,194 (21.5)
Farm	2,296	15,884
Non-Farm	67,244	101,310
Farm	3,294	16,888
Non-Farm	438,893	527,022
Private	364,517	418,363
Agricultural Services	1,679 (0.1)	2,401 (0.1)
Mining	9,874 (2.7)	26,474 (6.3)
Construction	54,454 (14.9)	68,827 (16.5)
Manufacturing	61,470 (16.9)	50,278 (12.0)
Transportation, Communications, Public Utilities	33,271 (9.1)	30,029 (7.2)
Wholesale Trade	13,185 (3.6)	10,531 (2.5)
Retail Trade	67,923 (18.6)	78,663 (18.8)
Finance, Insurance, Real Estate	20,696 (5.7)	21,241 (5.1)
Services	101,965 (28.0)	121,919 (29.1)
Government and Government Enterprises	74,376	108,659
Federal, Civilian	9,024	25,945
Military	1,741	2,249
State and Local	63,611	80,465

Per Capita Personal Income:	Mohave County	\$ 10,819
	Yavapai County	\$ 12,475
	State	\$ 13,680

Source: U.S. Department of Commerce, Bureau of Economic Analysis, April 1988 (Unpublished Data)

County and Community Revenue Sources

Actions by the BLM affect county and community revenue sources directly (wages, salaries, operations) and indirectly (payments in lieu of taxes, land exchanges).

The data in Tables 36 through 40 display revenue sources for the counties and Bullhead City and Kingman. The total payment in lieu of taxes represented about seven percent of the 1987 revenues in Mohave County and approximately four percent in Yavapai County.

Table 36
ARIZONA COUNTY INTERGOVERNMENTAL REVENUE: 1987 MOHAVE AND YAVAPAI COUNTIES

	MOHAVE COUNTY	YAVAPAI COUNTY
REVENUE FROM THE FEDERAL GOVERNMENT		
Payment in Lieu of Taxes	960,400	605,339
Housing Development Grants		11,561
Health and Hospital Reimbursement		440,783
Highway Aid Reimbursements	3,510	465,322
Other Highway Aid Reimbursement		35,688
General Revenue Sharing Grants	307,974	325,873
Manpower Training Grants	837,212	
Flood Control Aid		
All Other Federal Grants	124,340	600,991
TOTAL	2,233,436	2,485,557
REVENUE FROM THE STATE GOVERNMENT		
State Shared Sales Tax	4,166,108	5,439,756
State Liquor Tax	27,803	32,450
Lottery	550,035	550,035
State Highway Distributions	4,570,670	4,124,616
Health and Hospital Reimbursement	346,500	310,761
Law Enforcement Grants	609,436	453,029
Flood Control Aid		
Library Grants	42,450	
Park and Recreation Grants	89,495	
All Other State Grants	338,546	
TOTAL	10,741,043	10,910,647
REVENUE FROM LOCAL GOVERNMENTS		
Payments in Lieu	100,000	32,694
Highway Reimbursements		
Health Reimbursements	124,029	60,973
Other Payments From Government	4,620	192,902
TOTAL	228,649	310,569
GRAND TOTAL	13,203,128	*13,706,773

Source: This information was collected by the School of Public Affairs and the U.S. Census Bureau as a part of the Arizona State University School of Public Affairs annual survey of municipal finances in Arizona. Data for these tables were adjusted and verified by the staff of the Fiscal 2000 Project and used for that project's analysis of intergovernmental finance trends in Arizona.

*Note: Original data from source is \$4,000 less than the total of 13,706,773.



Table 37
ARIZONA COUNTY OTHER REVENUES: 1987 MOHAVE AND YAVAPAI COUNTIES

	MOHAVE COUNTY	YAVAPAI COUNTY
A. Sewer System Charges		88,547
B. Sanitation Charges	423,755	
C. Airport Charges		
D. Parks and Recreation Charges	234,913	
E. Ambulance Charges		
F. Hospital Charges		
G. Housing Development Charges		
H. Receipts of Equipment		
I. Other Charges	1,433,544	735,599
J. Special Assessment		1,788,525
K. Fines and Forfeits	1,142,762	874,064
L. Receipt From Sale of Property	13,750	
M. Rents and Royalties	35,686	18,408
N. Interest Earnings	862,737	482,824
O. Miscellaneous Other Revenue	403,493	1,485,832
TOTAL	4,550,640	5,473,799

Source: See Table 36

Table 38
ARIZONA TAX REVENUES: 1986 AND 1987

	BULLHEAD CITY	KINGMAN
PROPERTY TAXES		
Property Taxes		450,511
Auto In Lieu	282,287	181,413
Total Property Taxes	282,287	631,924
LOCAL SALES TAXES		
Municipal Sales and Use Tax	1,243,914	2,520,991
Public Utility Franchise	43,467	171,209
Hotel/Motel Transient Taxes	181,344	147,265
Total Local Sales Taxes	1,468,725	2,839,465
LICENSES, PERMITS AND OTHER TAXES		
Business Licenses	35,746	46,188
Occupational Registrations		
Building Permits	179,876	81,244
Cable TV Licenses		15,484
Amusement Licenses		
Other Municipal Inspection Fees		
Total Licenses and Permits	215,622	142,916
GRAND TOTAL	1,966,634	3,614,305

Source: See Table 36

Table 39
ARIZONA INTERGOVERNMENTAL REVENUE 1986 AND 1987

	BULLHEAD CITY	KINGMAN
REVENUE FROM THE FEDERAL GOVERNMENT		
Housing and Urban Renewal		
Community Development Block		17,313
General Revenue Sharing Grants	29,107	47,556
All Other Federal Grants	328,241	
Total Revenue From The Federal Government	357,348	64,869
REVENUE FROM THE STATE GOVERNMENT		
State Shared Sales Tax	917,840	560,016
State Shared Income Tax	880,681	539,536
Highway User Revenues	1,691,759	1,179,578
Local Transportation Assistance Fund	162,057	98,878
Housing and Community Development		
Water and Sewer Grants		
Law Enforcement		4,700
Fire Insurance Premium Tax		
Disaster Aid		
Job Partnership Training Act		2,066
Library Grants		
Park and Recreation Grants		
All Other State Grants	255,516	19,305
Total Revenue from The State Government	3,907,853	2,404,079
REVENUE FROM LOCAL GOVERNMENTS		
Payments In Lieu		
Highway Reimbursements		
Other Payments From Local Governments		128,180
Total Revenue from Local Governments		128,180
GRAND TOTAL	4,265,201	2,597,128

Source: See Table 35

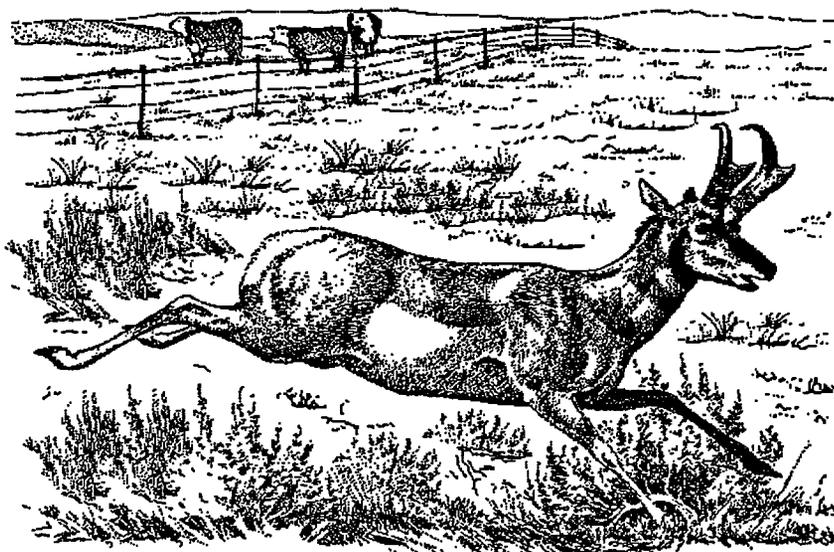


Table 40
ARIZONA CITIES OTHER REVENUES: 1986 AND 1987

	BULLHEAD CITY	KINGMAN
A. Water Utility Charges	0	2,478,625
B. Electric Utility Charges	0	0
C. Gas Utility System Charges	0	0
D. Transit or Bus System Charges	0	0
E. Sewer System Charges	0	130,177
F. Garbage Collection Charges	0	517,557
G. Parking Charges	0	0
H. Airport Charges	0	0
I. Parks and Recreation Charges	0	221,890
J. Ambulance Charges	0	0
K. Housing and Urban Renewal	0	0
L. Receipts from Sale of Equipment	0	0
M. Other Charges	95,721	3,243
N. Special Assessments	0	173,712
O. Receipts from Sale of Property	0	0
P. Rents and Royalties	0	0
Q. Interest Earnings	302,363	53,524
R. Fines and Forfeits	274,511	119,122
S. Miscellaneous Other Revenue	17,691	40,026
TOTAL	690,286	3,737,876

Source: See Table 36





CHAPTER IV ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

Chapter IV discusses the environmental consequences of the alternatives described in Chapter II. Implementation of the alternatives will create impacts of varying degrees. The purpose of this chapter is to estimate and analyze significant impacts and identify appropriate mitigations to reduce or eliminate adverse impacts. The interdisciplinary team analyzed expected impacts normally associated with oil and gas exploration and development. Impacts were found to be insignificant except in areas of critical environmental concern. In these areas, management prescriptions would reduce impacts to an insignificant level. Impacts are summarized in Table 18.

ANALYSIS GUIDELINES

The environmental base line is *Alternative 1* (Current Management); it represents no change from current management. The change to each environmental component that would occur by the year 2011 is described under each alternative. Cumulative impacts are addressed at the end of Chapter IV. All proposed plan actions are analyzed.

GENERAL ASSUMPTIONS

In order to analyze the impacts of each alternative it was necessary to make general assumptions. These assumptions are as follows.

1. The BLM will have the funding and work force to implement the selected alternative.
2. Impacts are direct unless otherwise noted.
3. Short-term impacts would occur within five years and long-term impacts would occur from 5 to 20 years after the plan is implemented.
4. All impacts are long-term unless otherwise noted.
5. Environmental assessments will be conducted before any activity plans are implemented.

6. All disposal land is free of encumbrances and can be disposed of.
7. Land identified for disposal would go into private ownership unless otherwise noted.
8. The rangeland management program will be as described in the range program summaries for the Final Cerbat/Black Mountain (BLM 1978) and Hualapai-Aquarius Grazing (BLM 1981) environmental impact statements.

IMPACT ANALYSIS BY ALTERNATIVES

ALTERNATIVE 1 - CURRENT MANAGEMENT

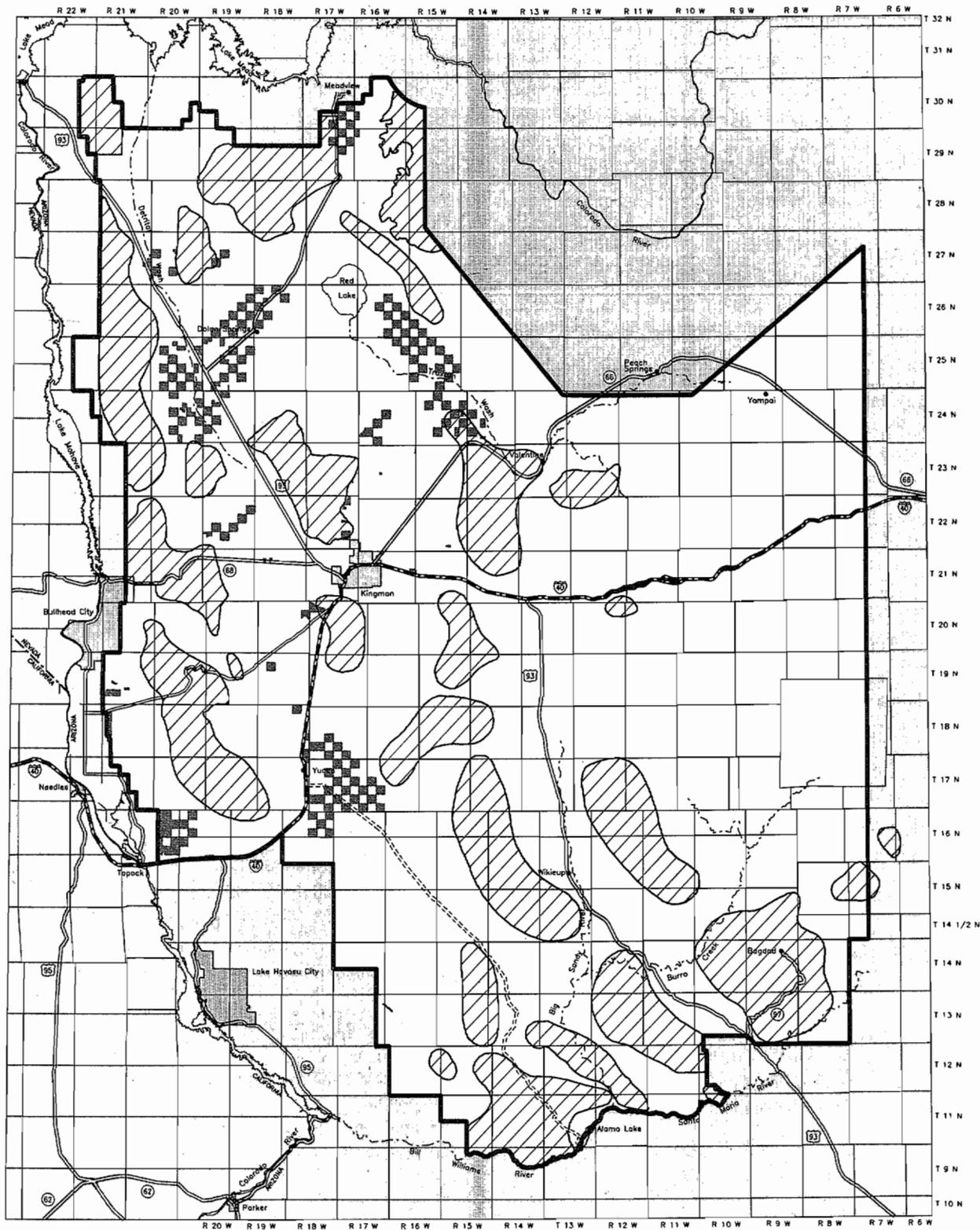
IMPACTS TO MINERAL DEVELOPMENT

From Lands Actions

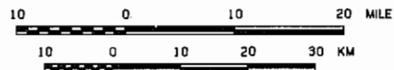
Ownership Adjustments

The transfer of roughly 102,547 acres of public land identified as disposal blocks (see Appendix 3) in the Black, Cerbat and Hualapai/Aquarius mountains management framework plans would negatively impact the exploration and development of minerals on these lands. Most of these lands have a low potential for occurrence of locatable minerals, and a low or unknown potential for oil and gas development. There is a high potential for the occurrence of leasable sodium and evaporite deposits in the northern portions of Hualapai and Detrital valleys. Some of the lands identified for disposal are on the fringes of known occurrences of these deposits, and their exchange would result in a loss of revenue to the government which would have to be considered in any valuation of the lands for exchange purposes (see Map 35).

HIGH POTENTIAL LOCATABLE MINERALS AND DISPOSALS - ALTERNATIVE 1



- LANDS PROPOSED FOR DISPOSAL - ALT 1
- AREA OF HIGH MINERAL POTENTIAL



Map 35