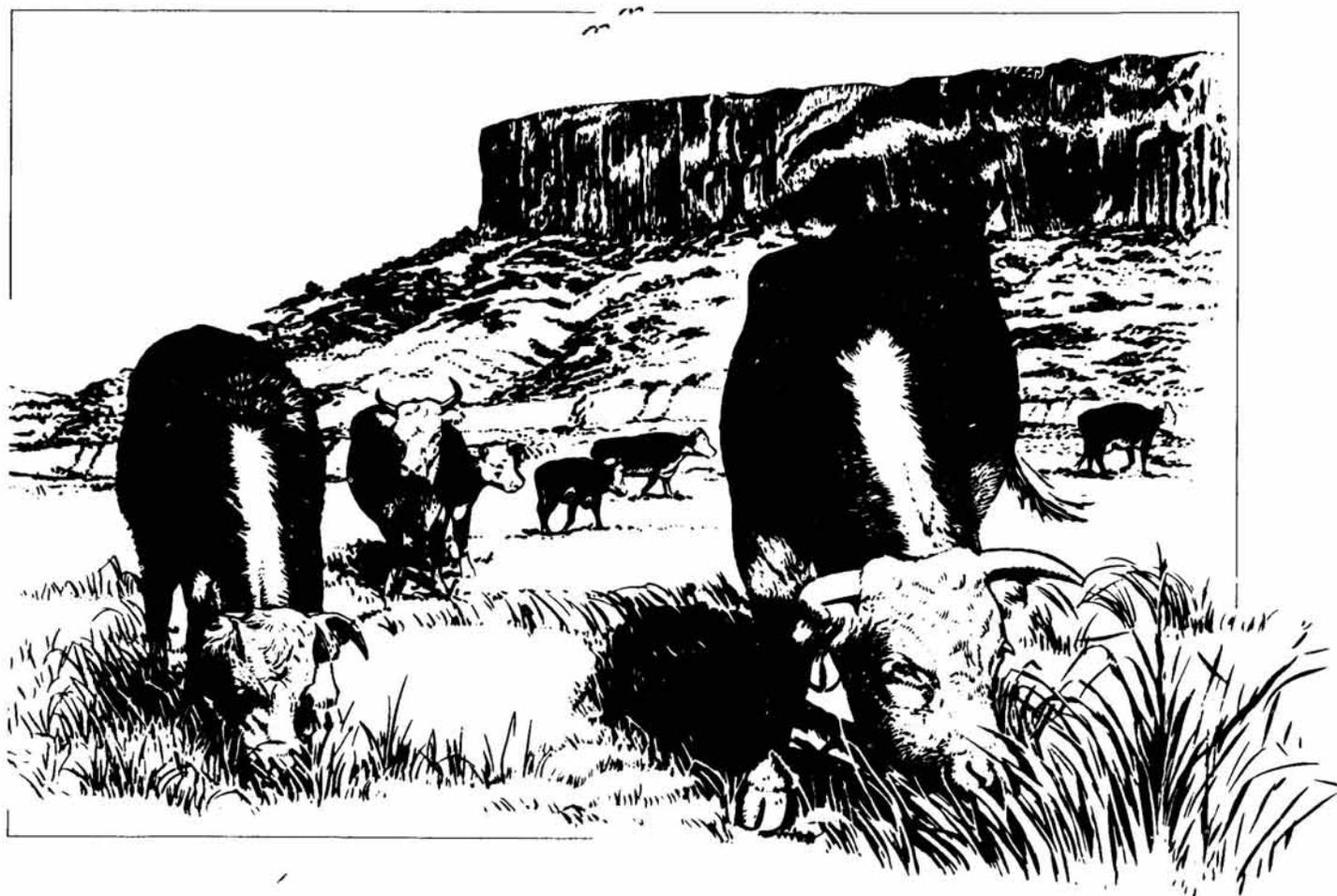


Chapter 2— Description of the Affected Environment



This Chapter provides a basis for assessing the impacts of the alternatives. Information is provided commensurate with the importance of impacts, with less important material summarized or simply referenced. More detailed descriptions of the affected environment are presented in local resource management plan, timber management plan, and grazing management plan EISs, which can be inspected at respective district offices. Other references are cited within the text by author and date of publication. A listing of these references appears in the References section.

Climate and Air Quality

The climate of the western portion of the EIS area is heavily influenced by Pacific maritime air masses, which result in moist, mild winters and dry, moderately warm summers. By the time the maritime air mass reaches the central portion of the EIS area, it is influenced by drier, continental Great Basin air. This condition results in hot, dry summers and cold winters. Continental polar air dominates the eastern portion of the EIS area, resulting in hot summers and long, cold winters.

Average annual precipitation ranges from 60 to 200 inches in the Cascades and coastal mountains to 10 inches in the northern Great Basin and 12 to 16 inches in the northern Great Plains.

Because of complex topography across the EIS area, microclimates greatly vary.

Smoke intrusions from wood stoves sometimes results in particulate levels exceeding EPA standards in urban areas during periods of atmospheric stability.

Although air quality problems exist in urban areas such as Boise, Missoula, Portland, Eugene, Medford, and Spokane, air quality in the EIS area is good overall.

The Clean Air Act Amendments of 1977 contain provisions to ensure that air quality does not deteriorate in areas with clean air. Class I areas, such as National Parks and wilderness areas, allow virtually no deterioration. Most of the EIS area is Class II, which allows moderate deterioration of air quality.

Geology and Topography

The EIS area includes several physiographic divisions, all of which are based upon differing rock types and formations. Generally, the areas consist of complexes of volcanics of the Cascades, sediments of the Coast Range, and high lava and

basin plains of eastern Oregon and Washington and southern Idaho. High massive mountains and volcanics dominate central Idaho and western Montana. Much of the high unglaciated plains of eastern Montana and Wyoming are underlain by sedimentary rock.

More detailed geologic and topographic information may be obtained from BLM state and district offices in the EIS area.

Soils

Variations in parent material, climate, and topography, over time, have resulted in many different soil types in the EIS area. The Great Plains of Montana and Wyoming have soils formed in glacial plains; sedimentary bedrock; and low terraces, fans, and flood plains. The northern Rocky Mountains have a complex of mountain soils, including the Idaho batholith and volcanics of the Yellowstone Plateau. Basin and range soils in portions of south Idaho and east Oregon and Washington generally occur on mountains and alluvial fans formed in mica schist, quartzite, and alluvium with some loess influence. The soils of the Snake River area occur on broad plains and plateaus with smaller areas of mountains and deep canyon lands. Western Oregon and Washington have the mountainous, volcanic soils of the Cascades and the high rainfall forest soils of the Coast Range.

Third order soil surveys have either been completed or are underway on most BLM lands in the EIS area. This information exists at BLM district offices in the EIS area.

Water Resources

Surface Water

The EIS area includes the entire range of moisture regimes, from the rain forests of west Oregon and Washington to the arid and semiarid rangeland of Idaho, Montana, and Wyoming. The area includes land on both sides of the continental divide with rivers flowing into the Pacific Ocean, Gulf of California, and Gulf of Mexico. The larger rivers include the Columbia, Snake, Missouri, Green, Yellowstone, Salmon, and Platte.

Rivers and streams in the rain forests are generally perennial and of good quality with low total dissolved solids (TDS). Streams in the rangeland areas vary from ephemeral to perennial, and TDS levels are normally high.

In western Oregon and Washington, the surface water is predominantly affected by the mild, moist climate. Most precipitation occurs as rain from November to March, but snow occurs at the higher elevations of the Cascade Mountains. Annual precipitation ranges up to 200 inches.

Idaho, Montana, Wyoming, and east Oregon and Washington have a somewhat variable moisture regime, but within the context of an arid to semiarid environment. Annual precipitation ranges from 6-8 inches in east Oregon and southcentral Wyoming to 40-45 inches in the higher elevations of Idaho and Montana. In these areas, most streamflow results from spring snowmelt, and local surges result from summer thunderstorms.

Surface water is an important resource throughout the EIS area. Large amounts are used by municipal, domestic, agricultural, and industrial users. Nonconsumptive uses include uses for fisheries, recreation, aesthetics, hydropower generation, transportation, and water quality maintenance. BLM-administered lands contribute to or lie within many municipal watersheds.

Background data for the levels of herbicides in streams are sparse, but some data exist for western Oregon and Wyoming. U.S. Geological Survey (USGS) WATSTORE data (see Glossary) reveal that herbicides are generally not detectable in streamflow in western Oregon. In Wyoming, the USGS samples collected and analyzed during 1977 and 1978 detected picloram in 34.5 percent of the samples. These samples were collected from streams draining a large agricultural area. This sampling period may have had more intensive herbicide treatment than normal. The maximum concentration found was 0.18 micrograms/liter (ug/liter), much less than the EPA recommended 24-hour maximum for potable waters (Newton and Norgren 1977), and well below any harmful levels for fish, wildlife or crops. (Butler 1980).

Ground Water

Ground water quantity and quality in the EIS area vary greatly and are normally a direct product of the geologic formation in which the ground water originates. The more productive areas are normally the alluvial deposits, but the Snake River basalt is also a highly productive zone. In western Oregon, alluvial deposits may yield up to 500 gallons per minute. Most wells are less than 1,000 feet deep, and shallow wells normally occur in alluvial deposits.

Ground water use is determined by the presence of good quality water at a depth that makes it economical to pump. In many areas, ground water is the only source for municipal, domestic, and agricultural uses.

The recharge areas are normally in the higher elevations, except for alluvial deposits, which may function as their own recharge area.

Vegetation

Wetlands and Riparian

Many noxious weeds occur in wetlands and riparian areas.

Wetlands occur along lakes, ponds, marshes, rivers, and streams. They are often inundated by water and normally have saturated or seasonally saturated soil conditions. Common wetland plants range from cottonwoods and willows to sedges and cattails. The width of wetlands may vary from a few feet along small streams to several hundred feet along major rivers. Because of the presence of moisture and abundant nutrients, wetlands are often the most productive areas for vegetation growth. They are valuable for wildlife habitat and often provide a large portion of the forage in grazing allotments.

In the arid or semiarid lands of the EIS area, wetlands make up a small percent of the total land surface. For example, wetlands account for only 1 percent of the land in BLM's Rock Springs District in Wyoming. The percentage of wetlands is larger in western Oregon and Washington and northern Idaho than in the rest of the EIS area.

Terrestrial Vegetation

Noxious Weeds and Poisonous Plants

Many noxious weeds and poisonous plants occur on 5 percent of the BLM administered lands in the EIS area and 7 percent of all land, public and private, in the five states. (See Table 1-1) In 1982 and 1983, an average of 6,077 weed-infested acres was treated annually with herbicides on BLM lands in the EIS area. In addition, biological control agents (insects) were used to treat approximately 11,000 acres in 1982 and 24,000 acres in 1983, mostly for tansy ragwort in Oregon. Noxious weeds treated include Canada thistle, hoary cress, leafy spurge, Russian

knapweed, spotted knapweed, diffuse knapweed, dalmatian toadflax, common toadflax, common tansy, tansy ragwort, Dyers woad, rush skeletonweed, yellow starthistle, musk thistle, and scotch thistle. Appendix C lists the following information on noxious weeds: origin, life duration, annual estimated rate of spread, annual estimated reduction of carrying capacity, and species that have toxic effects on other plants. Appendix C also lists species that have been reported to have health hazards to humans or livestock. Appendix E shows the susceptibility of common weeds to control by four herbicides: 2,4-D, dicamba, picloram, and glyphosate.

Biological agents have been reported to control some noxious weeds. Sheep have been reported to control top growth of leafy spurge (Lacey and others 1983) and spotted knapweed (Kelsey 1984). Leafy spurge, however, is toxic to cattle and horses (Hulbert and Oehme 1961). See Appendix F for other biological agents that can be used for weed control.

In the EIS area, state and county weed control laws require the control of noxious weeds. Many noxious weeds spread rapidly once they become established in an area and are difficult and costly to control. When noxious weeds are not controlled on BLM lands within the EIS area, these infestations continue to be a source of possible infestations to other lands. All landowners within an area must cooperate to satisfactorily control weeds.

Land Resource Regions

Widely diverse vegetation communities occur in the EIS area, varying by climate, moisture, elevation, soils, and other environmental factors. These communities present a variety of concerns for noxious weed control. This section lists some of plant species occurring in the EIS area and by major land resource region (USDA, SCS 1981). Major land resource regions within the EIS area are shown on Map 2-1.

A - Northwestern Forest, Forage, and Specialty Crop Region. This region supports forest vegetation in many places, prairie vegetation in some places, and savanna vegetation in others. Western hemlock, western redcedar, Douglas-fir, and Sitka spruce are common, and grand fir grows in places. Also common are Pacific silver fir, noble fir, and western white pine, bigleaf sagebrush, ponderosa pine, sugar pine, incense-cedar, white fir, red fir, tanoak, California black oak, canyon live oak, and madrone. At higher elevations, mountain

hemlock is an important part of the plant community, and subalpine fir and whitebark pine grow near timberlines.

Stands of cottonwoods and willows grow on overflow channels, streambanks, and islands. Oregon white oak is common in savannas, especially in Oregon. Red alder is an invader on disturbed sites in Western Oregon and Washington. Lodgepole pine is common along the coastal dunes.

Tree species in the southern part of the region include Port-Orford-cedar, California bay, madrone, tanoak, and golden chinkapin. Major shrubs and forbs include salmonberry, ladyfern, swordfern, rhododendron, California laurel (Oregon myrtle), willow, vine maple, huckleberry, sala, oxalis, violet, poison oak, ceanothus, manzanita, Whipplea, Oregon grape, Indian plum, snowberry, hazel, oceanspray, serviceberry, rose, and thimbleberry.

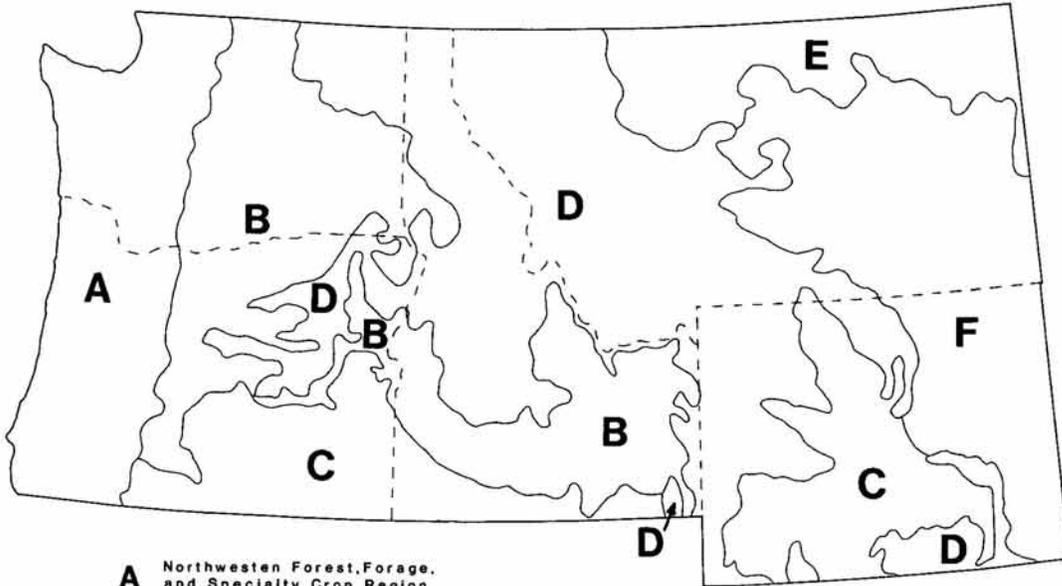
Red and western fescues, bromes, and sedges are common in the prairies and savannas. Blue wildrye, fescues, bluegrass, mountain brome, and some browse species occur in the understory in open stands of timber. Soft chess, wild oats, burclover, fescues, and bromes are major prairie species.

B - Northwestern Wheat and Range Region. This region supports conifer forests, shrub-grass, desert shrub, and grasses. Grand fir, western larch, and lodgepole pine have an understory of vacciniums and Menziesia. Pacific silver fir, mountain hemlock, subalpine fir, and whitebark pine grow at the highest elevations.

Curlleaf mountain mahogany, Douglas-fir, aspen, and Rocky Mountain juniper grow on high mountain slopes. Western juniper is common on the drier, stonier sites. Small stands of ponderosa pine, with oak on warmer sites along the Columbia River, are on north slopes, in canyons and draws, and along streams. Dwarf hardwoods of hackberry and maple also grow in canyons and draws. Snowberry is the most common shrub in the pine stands. Poison oak is the most common shrub in the oak stand.

Important shrubs of this region include big sagebrush, low sagebrush, stiff sagebrush, antelope bitterbrush, greasewood, Gardner saltbush, rabbitbrush, black sagebrush, rose, black hawthorn, and low Oregon grape. Shadscale, scarlet globemallow, Indian paintbrush, lupine, common cowparsnip, arrowleaf, phlox, tapertip hawksbeard, biscuitroot, penstemon, milkvetch, and lambstongue fawnlily are among the important forbs in the region.

Land Resource Regions for EIS Area



A Northwestern Forest, Forage,
and Specialty Crop Region

B Northwestern Wheat
and Range Region

C Western Range
and Irrigated Region

D Rocky Mountain Range
and Forest Region

E Northern Great Plains
Springs Wheat Region

F Western Great Plains Range
and Irrigated Region

Map 2-1

Some of the important grasses in the region include Idaho fescue, Cusick bluegrass, bluebunch wheatgrass, Sandberg bluegrass, needleandthread, Thurber needlegrass, Indian ricegrass, Nevada bluegrass, prairie junegrass, oniongrass, and slender wheatgrass.

The vegetation variance within the region depends on soil moisture, texture, slope, and exposure. For example, inland saltgrass, basin wildrye, and greasewood grow on saline-alkali soils.

C - Western Range and Irrigated Region. This region is predominately a grass and shrub vegetation area with some woodlands. The major grass species include Nevada bluegrass, Sandberg bluegrass, Idaho fescue, bluebunch wheatgrass, cheatgrass, wiregrass, slender wheatgrass, creeping wildrye, bluegrass, Thurber needlegrass, basin wildrye, squirreltail, Indian ricegrass, Columbia needlegrass, western wheatgrass, and needleandthread. Predominant forbs in the area include penstemon, phlox, milkvetch, lupine, and aster. The region's predominant shrubs include rabbitbrush, bitterbrush, mountain mahogany, shadscale, bud sagebrush, Nuttall saltbush, winterfat, big sagebrush, spiny hopsage, Gardner saltbush, greasewood, spiny hopsage and silver sagebrush. Trees include Douglas-fir, white fir, California red fir, Utah juniper, singleleaf pinyon, Rocky Mountain juniper, lodgepole pine, ponderosa pine, limber pine, aspen, whitebark pine, Englemann spruce, subalpine fir, and bristlecone pine.

D - Rocky Mountain Range and Forest Region. This area supports forests on upper slopes, alpine tundra above timberline, conifer forests, aspen, grasses, mountain shrub and sage brush-grass vegetation. Major tree species include western white pine, ponderosa pine, lodgepole pine, western redcedar, western larch, hemlock, Douglas-fir, subalpine fir, whitebark pine, Rocky Mountain juniper, Englemann spruce, limber pine, bristlecone pine, white fir, and pinyon. Blue spruce, narrowleaf cottonwood, willow, aspen, alder, and birch trees are also common. The area's predominant shrubs are common snowberry, skunkbush sumac, big sagebrush, Gambel oak, curlleaf and birchleaf mountain mahogany, serviceberry, chokecherry, and antelope bitterbrush. Major grass species include bluebunch wheatgrass, rough fescue, Idaho fescue, Alpine grasses, bearded wheatgrass, blue wildrye, mountain brome, grammas, needlegrasses, bluegrasses, and sodforming wheatgrasses.

E - Northern Great Plains Spring Wheat Region. This area supports natural prairie vegetation. Western wheatgrass, blue grama, needleandthread, and green needlegrass are dominant species.

Prairie sandreed and little bluestem are important species on the very shallow soils. Buffaloberry, chokecherry, and prairie rose are common in draws and narrow valleys.

Little bluestem is an important species on sloping and thin soils. Prairie cordgrass, northern reedgrass, and slim sedge are important species on wet soils. Western snowberry, stiff goldenrod, echinacea, and prairie rose are commonly interspersed throughout the area.

F - Western Great Plains Range and Irrigated Region. This area supports grassland vegetation. Rhizomatous wheatgrasses, green needlegrass, needleandthread, blue grama, and threadleaf sedge are dominant species on deep soils. Bluebunch wheatgrass and little bluestem are major species on shallow soils on hills and ridges. Basin wildrye, green needlegrass, rhizomatous wheatgrasses, and shrubs are dominant along bottom land and streams. Big sagebrush is the dominant shrub.

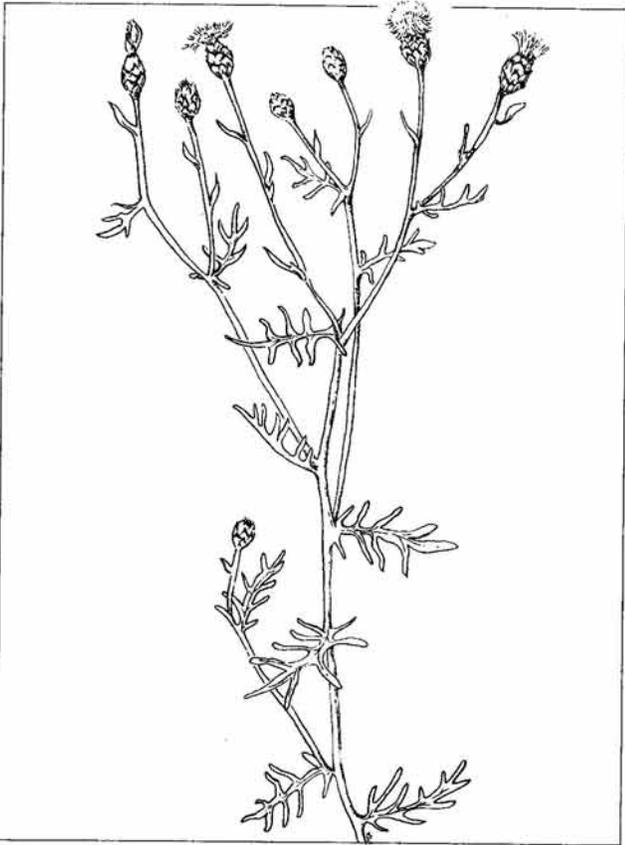
Big bluestem grows along streams, especially where an effective water table is present. Sand sagebrush grows on sandy soils and silver sagebrush on clayey soils in the west. The eroded walls and escarpments of the badlands are devoid of vegetation.

Ponderosa pine grows in scattered open stands. Bur oak grows throughout the area, in places in nearly pure stands. Quaking aspen and eastern hophorn beam are scattered throughout the forests. Green ash and American elm are scattered along the draws.

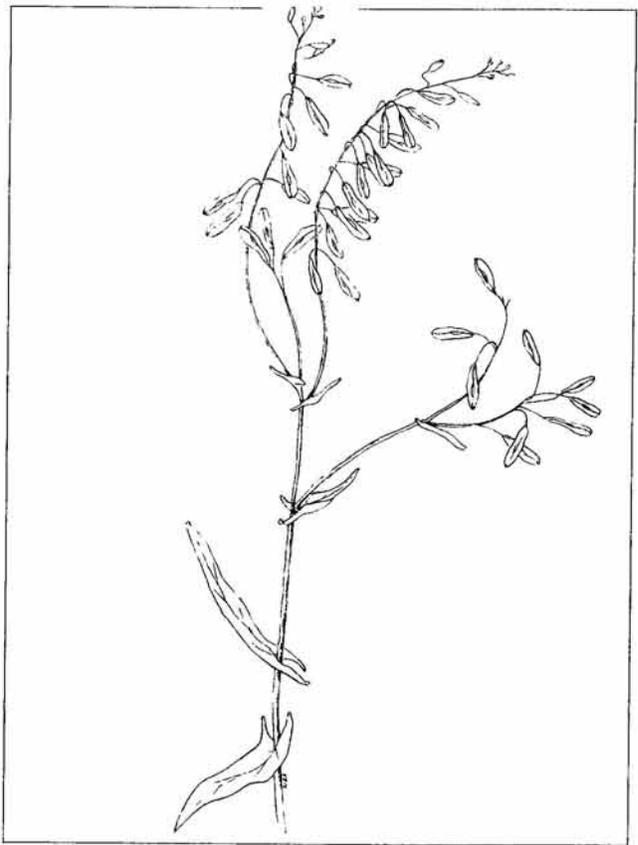
Black Hills spruce grows at higher elevations and along major drainageways. Paper birch and quaking aspen grow on sites burned by wildfire. Kentucky bluegrass, poverty oatgrass, Richardson needlegrass, and Canada wildrye are common under open forest stands, and cottonwood trees are common along the major drainageways.

Threatened, Endangered, and Sensitive Plants

Endangered plants are species in danger of extinction throughout all or a significant portion of their range. Threatened plants are not now endangered but are likely to become so within the foreseeable future throughout all or a significant portion of their range. Sensitive plants (see Glossary) are species not yet officially listed but undergoing a status review.



Spotted Knapweed



Dyer's Woad



Death Camus



Tansy Ragwort

Three federally-listed endangered plant species have been reported for the EIS area. McDonald's rock-cress (*Arabis mcdonaldiana*) and Malheur wire-lettuce (*Stephanomeria malheurensis*) occur in Oregon. The only recorded sighting of McDonald's rock-cress in the EIS area has been within the Siskiyou National Forest. However, the BLM manages a lot of serpentine habitat in the Medford District that is similar to that in the Siskiyou National Forest. The Malheur wire lettuce is in the Burns District south of Burns. The MacFarlane's four-o'clock (*Mirabilis macfarlanei*) is located in the Snake River Canyon in Idaho and Oregon. It is also in the Salmon River Gorge between Whitebird and Riggins, Idaho. No federally listed threatened plants are known to occur in the EIS area (50 CFR 17.11 and 17.12).

At least 268 sensitive species observed in the EIS area are under review for listing as threatened or endangered by the U.S. Fish and Wildlife Service or individual states. The final status of these species will be determined as enough data is collected. In the interim, these species will be protected from management activities likely to jeopardize their survival on BLM lands. A list of these sensitive species may be obtained from respective BLM state and district offices.



Mule Deer

Animals

Livestock and Wild Horses

Livestock (cattle, sheep, and horses) grazing is one of the primary uses of the BLM lands in the EIS area, and 54 percent of the cattle and sheep and 48 percent of the horses that graze on BLM-administered land are within this area. The EIS area had 3.9 million livestock during 1983, which grazed on 56.2 million acres, annually consuming 43 percent of the forage on BLM lands or 6.6 million animal unit months (AUMs) (USDI, BLM 1984).

The Wild Free-Roaming Horse and Burro Act (PL 92-195) provides for the protection, management, and control of wild free-roaming horses on BLM lands. The EIS area has 46 wild horse management units, which were planned to provide forage for at most 6,612 horses.

Wildlife

The EIS area encompasses a variety of wildlife habitats, including 45.2 million acres of important big-game habitat, 42.8 million acres of important small-game habitat, and 1.8 million acres of waterfowl habitat. Wildlife diversity and abundance and the occurrence of rare or unique species and habitat values are among the highest found on BLM lands in the 48 contiguous states.

Many mammals inhabit the BLM lands of the EIS area, including the following big-game species: Rocky Mountain sheep, antelope, elk, moose, mountain goat, blacktailed deer, whitetailed deer, mule deer, black bear, grizzly bear and mountain lion.

Pronghorn antelope occur on lower elevation sagebrush and grasslands habitats. Pronghorn are mainly browsers that utilize sagebrush, rabbitbrush and sagewort year round. Sagebrush is the mainstay, particularly in winter. In the spring, pronghorn eat forbs and grasses to supplement their diet.

Elk occur on conifer and higher elevation sagebrush and grassland habitats. Elk use BLM lands year round but mostly from winter through early summer. Crucial spring calving and winter range habitat often occurs on BLM lands next to valley bottoms.

Blacktailed deer, whitetailed deer, and mule deer on BLM lands are the most common, widely distributed and hunted big game species in the EIS area. The EIS area provides year-round habitat for these species.

Blacktailed and whitetailed deer occur mainly in the riparian deciduous bottoms along rivers and creeks. Blacktailed deer occur only in the extreme western portion of the EIS area.

Moose mainly inhabit the willow-covered stream bottoms leading from the mountain ranges and also occupy the aspen-conifer foothills. In winter, moose populations are higher in drainages and low-lying areas as moose migrate from the summer ranges of the upland meadows and aspen-conifer regions.

The use of BLM lands by mountain goats and barbary and bighorn sheep varies seasonally but involves summer range, crucial spring lambing, and winter range.

Important bear habitats extend from the mountains down along the riparian waterways. These riparian areas provide important forage and cover during spring and summer and can be important when berries ripen in the fall.

Mountain lions usually occur in areas of high ungulate concentrations. Little is known of their population levels or densities.

The sage grouse is one of the most prominent game birds of the EIS area. It typically inhabits sagebrush areas with some vegetation diversity and a water supply. Forbs are a critical habitat component for virtually all upland game birds during the spring and summer months.

Like the sage grouse, the sharp-tailed grouse inhabits sagebrush grasslands near brushy stream bottoms and along the edges of pine-covered breaks and ridges. Sharp-tailed grouse require good brush cover for nesting and early brood protection.

The blue, Franklin, and ruffed grouse occupy timbered areas in mountainous regions having aspen, conifer, and streamside vegetation. Franklin and ruffed grouse occupy a similar habitat season long. Blue grouse occupy aspen and willow thickets of the foothills and mountain valleys during the summer and migrate to the higher elevation coniferous forests and ridges in the winter.

Chukar and Hungarian partridge habitats are isolated within the EIS area. Suitable habitat generally occurs where steep slopes with rocky outcroppings are combined with badland creek bottoms.

Ring-necked pheasants usually inhabit croplands along creek and river bottoms, generally below 5,000 feet in elevation. In some instances, pheasants occur in brushy draws and sagebrush areas next to cropland.

Other upland game birds in the EIS area are the whitetailed ptarmigan, valley quail, mountain quail, scaled quail, bobwhite quail, wild turkey, mourning dove, band-tailed pigeon, and common snipe.

Most of the EIS area's waterfowl are migrant, short-term occupants, following the Central and Pacific flyways during spring and fall. Some waterfowl overwinter near unfrozen water. Nesting waterfowl species of the EIS area include mallard, goldeneye, American widgeon, Canada goose, teal, gadwall, pintail, shovellers, ring-necked mergansers, and the lesser scaup.

Many stock ponds, reservoirs, streams, and rivers provide extensive acreage of shoreline and riverbank nesting and feeding habitat required for the existence of shore birds. Great blue herons, gulls, grebes, snipe, lesser yellowlegs, willets, avocets, terns, upland sandpipers, killdeer, and northern long-billed curlews all nest in the EIS area. These species migrate through the area in spring and fall.

The central region of the EIS area is a winter concentration area for golden eagles and rough-legged hawks, which depend upon rabbits as their major winter food source. Bald eagles congregate in winter roosts near rivers and lakes in the EIS area. Bald and golden eagles, redtailed hawks, kestrels, prairie falcon, Ferruginous hawk, burrowing owl, osprey, marsh hawks, and great-horned owls are all known to nest in the area. The turkey vulture and falcon are also common summer residents. Ravens, crows and other large nongame birds also nest in the EIS area.

Cliff areas, rock outcrops, and shrubs provide nesting sites for most of these raptors. In open country, utility poles, fenceposts, isolated trees, rock outcrops, and other isolated structures provide important perches for hunting raptors. These perches are often well used along transportation routes where traffic-killed small animals are an attractive food source.

Many seed-eating and insectivorous birds inhabit riparian and upland vegetation zones, but little information exists on their densities, distribution, and limiting factors in the EIS area. Woodpeckers and other cavity-nesting birds depend on dead trees (wildlife trees) for their existence.

Fish

Many game fish species inhabit the EIS area, including salmon, steelhead, cutthroat trout, rainbow trout, brown trout, dolly varden, brook trout, lake trout, California golden trout, grayling, walleye, northern pike, paddlefish, sturgeon, smallmouth bass, largemouth bass, whitefish, perch, ling, crappie, and catfish.

Trout spawn both in major rivers and tributary streams. In the EIS area the estimated range of spawning and the time when eggs, alevin, and swim-up fry are present for game fish species are grouped according to season of spawning, fall and spring. Rainbow and cutthroat trout spawn in the spring from April 1 to June 15, and the eggs, alevin, and swim-up fry are present from April 1 to July 30. Fall spawners, brook and brown trout, spawn from October 1 to November 15, and eggs, alevin, and swim-up fry are present from October 1 through April 30.

Threatened and Endangered Animals

Twenty-five animal species in the EIS area (Table 2-1) are officially listed by the U.S. Fish and Wildlife Service or the states of Idaho, Montana, Oregon, Washington, or Wyoming as threatened, endangered, or proposed in the Federal Register for designation as threatened or endangered (50 CFR 17.11 and 17.12).

In addition, at least 134 wildlife species are listed as special interest or sensitive species by individual states within the EIS area.

Cultural Resources

Federal agencies have been charged with responsibility for managing cultural and paleontological resources on lands under their jurisdictions. Through a group of laws beginning with the Antiquities Act (1906) (Chap. 3060), BLM has been mandated to identify, protect, and enhance such resources on public lands.

Surveys of existing cultural resource information (Class I inventories) have been completed for each BLM district and may be examined in the BLM district offices.

Many archaeological, historical, and paleontological sites have been found on or near BLM-administered land in the EIS area. Some of the information has been lost from all of these sites as a result of natural or human disturbances before discovery. Future intensive surveys are certain to locate many more sites. Most identified archaeological sites appear to have been small, seasonally used campsites. Most historical sites relate to early settlement, transportation, mining, and logging. Paleontological resources in the EIS area include many vertebrate, invertebrate, and plant fossil sites. Lists and descriptions of known paleontological sites on or near BLM lands are maintained by BLM district offices. All reports of fossil-bearing deposits are examined by specialists to avoid destroying important fossils.

Visual Resources and Recreation

Visual resources consist of the land, water, vegetation, animals, and other natural or constructed



Table 2-1. Threatened and Endangered Animals in the EIS Area

Species	State Status/Occurrence					
	Federal Status	Idaho Status	Montana Status	Oregon Status	Washington Status	Wyoming Status
Mammals						
Grizzly bear, <i>Ursus arctos horribilis</i>	T	T	T	-	T	T
Woodland caribou, <i>Rangifer tarandus caribou</i>	E	E	E	-	E	-
Black-footed ferret, <i>Mustela nigripes</i>	E	-	E	-	-	E
Wolverine, <i>Gulo gulo</i>	-	-	-	T	-	-
Columbia white-tailed deer, <i>Odocoileus virginianus leucurus</i>	E	-	-	E	E	-
Southern sea otter, <i>Enhydra lutris nereis</i>	T	-	-	T	E	-
Gray wolf, <i>Canis lupus</i>	E	E	E	-	E	E
Pygmy rabbit, <i>Sylvilagus idahoensis</i>	-	-	-	-	T	-
Birds						
Peregrine falcon, <i>Falco peregrinus tundrius</i>	T	-	-	E	E	-
Peregrine falcon, <i>Falco peregrinus anatum</i>	E	E	E	E	E	E
Bald eagle, <i>Haliaeetus leucocephalus anascanus</i>	E/T	E	E	T	T	E
Whooping crane, <i>Grus americana</i>	E	E	E	-	-	E
Northern spotted owl, <i>Strix occidentalis caurina</i>	-	-	-	T	T	-
Short-tailed albatross, <i>Diomedea albatrus</i>	E	-	-	-	-	-
California condor, <i>Gymnogyps californianus</i>	E	-	-	-	-	-
Brown pelican, <i>Pelecanus occidentalis</i>	E	-	-	E	E	-
Aleutian Canada Geese, <i>Branta canadensis leucopareia</i>	E	-	-	E	E	-
White pelican, <i>Pelecanus erythrorhynchos</i>	-	O	O	O	O	O
Sandhill crane, <i>Crus Canadensis</i>	-	O	O	O	E	O
Snowy Plover, <i>Charadrius alexandrinus</i>	-	-	-	T	E	E
Upland sandpiper, <i>Bartramia longicauda</i>	-	-	-	-	E	-
Ferruginous hawk, <i>Buteo regalis</i>	-	O	O	O	O	E
Amphibians						
Western spotted frog, <i>Rana pretiosa</i>	-	-	-	T	-	-
Wyoming toad, <i>Bufo hemniophrys baxteri</i>	E	-	-	-	-	E
Western pond turtle, <i>Clemmys marmorata</i>	-	-	-	-	T	E
Fish						
Bonytail chub, <i>Gila elegans</i>	E	-	-	-	-	E
Borax Lake chub, <i>Gila boraxobius</i>	E	-	-	E	-	-
Humpback chub, <i>Gila cypha</i>	E	-	-	-	-	E
Kendall warm springs dace, <i>Rhinichthys osculus thermalis</i>	E	-	-	-	-	E
Colorado squawfish, <i>Ptychocheilus lucius</i>	E	-	-	-	-	E
Hutton Tui chub, <i>Gila bicolor</i>	T	-	-	O	-	-
Foskett speckled dace, <i>Rhinichthys osculus</i>	T	-	-	O	-	-
Warner sucker, <i>Catostomus warnermesis</i>	P	-	-	O	-	-
Insects						
Oregon silverspot butterfly, <i>Speyeria zerene hippolyta</i>	T	-	-	O	T	-

T = Threatened
P = Proposed for designation as threatened or endangered
E = Endangered
O = Occurrence in state/Protected

features visible on public lands. Highways, rivers, and trails of the five states pass through a variety of characteristic landscapes where natural attractions such as waterfalls can be seen and where cultural modifications exist. To enable visual resources to be considered when planning weed management, public lands have been assigned visual resource management (VRM) classes according to scenic quality, sensitivity level, and distance zone criteria. VRM classes provide objectives designed to mitigate adverse impacts of land management practices on scenic values (BLM Manual 8400). VRM maps and narratives derived from inventories and evaluations of visual resources on public lands may be examined in respective BLM district offices.

Among the outdoor recreation activities occurring on BLM lands in the EIS area are sightseeing, picnicking, camping, fishing, and hunting. Other popular activities are off-road vehicle use, horseback riding, river floating, and the studying of natural features. Some of these activities, such as camping and picnicking, occur at recreation sites that have noxious weeds. Table 2-2 shows annual recreation visits on BLM lands. Detailed information on recreational use of public lands may be obtained at BLM district offices.

Wilderness and Special Areas

The EIS area contains five designated wilderness areas totalling 19,700 acres and 224 wilderness study areas (WSAs) totalling 5,221,500 acres. The EIS area also has many designated or proposed special areas such as areas of critical environmental concern (ACECs), natural areas, scenic waterways, and scenic trails.

Economic Conditions

The five states in the EIS area are presented as the regional economy that would be affected by the Proposed Action or alternatives. The five states had a 1980 population of 8.9 million, a 24 percent increase over the 1970 population. Table 2-3 shows population fluctuations over the past three decades, and Table 2-4 shows income and employment for the EIS area.

BLM administers roughly 52 million of the region's 312 million acres, or 17 percent of the land base (USDI, BLM 1984). The average annual cost of controlling weeds on BLM land in the EIS area in 1982 and 1983 amounted to \$344,000.

Several studies have reported estimates of the magnitude of losses from noxious weeds on all lands, both public and private.

The annual forage loss on all lands to range users caused by spotted knapweed alone is estimated at \$4.5 million in Montana (Bucher 1984). A University of Idaho study estimated the annual economic loss from weeds in Idaho to exceed \$500 million (Lewiston Morning Tribune 1980). In illustrating potential economic losses, Pehallegon (1983) estimated \$19.5 million in economic losses from 4.5 million acres of weed-infested range lands in Washington State.

Economic losses from poisonous plants occur on

Table 2-2. Annual Recreation Visits on BLM-Administered Lands, 1983

	Ore.	Wash.	Idaho	Mont.	Wyo.	Total
Hunting	862,800	2,400	6,286,400	579,400	4,063,000	11,794,000
Fishing	813,600	12,600	404,800	786,000	285,200	2,302,200
Camping	419,625	4,000	543,125	393,750	441,625	1,802,125
Boating	565,750	21,000	550,750	204,250	1,261,250	2,603,000
O.R.V.	95,250	57,000	267,750	596,500	667,750	1,684,250
Other	1,818,750	13,000	1,010,750	1,823,250	1,477,250	6,143,000
Total						26,328,575

Recreation Visit: A visit, whether for a few minutes, a full day, or more, to BLM-administered lands and waters by a person to engage in any recreation activities, except those part of or incidental to the pursuit of a gainful occupation.

Source: USDI, BLM 1984.

Table 2-3. Population, 1960-1980

	1960	1970	1980
Idaho	667,191	713,015	943,935
Montana	674,767	694,409	786,690
Oregon	1,768,687	2,091,533	2,633,105
Washington	2,853,214	3,413,244	4,132,156
Wyoming	330,066	332,416	469,557
Region	6,293,925	7,244,617	8,965,443
United States	179,323,175	203,235,298	225,504,825

Source: U.S. Dept. of Commerce, Bureau of the Census 1980.

public lands in the EIS area. Data adapted from Nielson (1978) shows the annual estimate from mortality and reduced calving or lambing would amount to \$12 million annually on lands of all ownerships:

Cattle - 1 percent mortality of adult animals (\$250/head) - \$3,827,000

Cattle - 1 percent reduction in calf crop (\$160) - \$2,449,300

Sheep - 3.5 mortality of adult animals (\$50/head) - \$4,230,600

Sheep - 1 percent in reduction in lamb crop (\$45/head) - \$1,631,800

These estimates are based on the assumption that some degree of poisonous weed control is accomplished.

Social Environment

The social environment affected by BLM's weed control program includes individuals; the companies and businesses they work for; the communities, organizations, and groups they have formed; and their agencies and institutions of government. The social environment also includes attitudes, opinions, and perceptions about weed control policies and practices. For this EIS, BLM did not undertake a detailed social analysis of the EIS area that included a population profile, demographic analysis, institutional analysis, or formal public opinion survey. During the past several years, however,

Table 2-4. Employment and Personal Income, 1982

	Idaho	Montana	Oregon	Washington	Wyoming	United States
Employment by Source (Thousand Employees)						
Totals ¹	416	367	1,168	1,925	266	106,068
Proprietor						
Farm	27	24	41	44	9	2,723
Non Farm	43	42	120	154	23	7,473
Wage and Salary						
Farm	23	10	27	48	6	1,321
Non Farm						
Agricultural	5	2	10	16	2	591
Services						
Mining	4	9	2	3	35	1,124
Construction	14	13	29	73	19	3,875
Manufacturing	48	21	186	287	9	18,856
Transportation & Public Utilities	19	23	56	88	18	5,082
Wholesale Trade	22	17	62	98	10	5,321
Retail Trade	54	55	176	279	38	15,204
Finance, Insurance, and Real Estate	15	14	58	92	8	5,500
Services	64	62	200	335	36	20,415
Government						
Federal, Civilian	12	13	29	66	7	2,909
Federal, Military	9	8	10	95	6	2,630
State and Local	57	54	162	247	40	13,044
Total Personal Income (Thousand \$)	8,710	7,680	27,350	49,110	6,210	2,751,520
Per Capita Income (\$)	8,937	9,544	10,231	11,466	12,211	11,100

¹Consists of wage and salary jobs (full and part-time) plus number of proprietors.

Source: U.S. Department of Commerce, Regional Economic Information System, Bureau of Economic Analysis 1984.

BLM has conducted studies in the EIS area, with extensive public involvement, for several EISs and many environmental assessments. The following description of the social environment that could be affected by BLM's weed control program is based on that information and on concerns expressed.

In addition to direct impacts on jobs and personal income, certain social aspects of employment might be affected by BLM's programs: the importance of certain types of jobs to specific communities, dependence on particular jobs, availability of alternative jobs, access to jobs, and a community's level of acceptance of certain types of work. For example, some people highly depend on a certain type of work; for some people, alternative jobs do not exist, access to alternative jobs is limited, or alternative jobs are perceived as inappropriate work. The social effects of job losses are more significant for these people than for those who are flexible and have access to alternative jobs.

A significant social issue related to BLM's weed control program is public disagreement about the use of herbicides and the effectiveness of alternative treatments. Opponents of herbicide use perceive a BLM bias in favor of herbicides. The opponents see BLM as an advocate of herbicide use, defending that position rather than seeking public input to the process of decisionmaking. The proponents see BLM abandoning what they believe to be a demonstrably safe and effective means for controlling noxious weeds.

The controversy has opposing factions whose points of view are sometimes unaffected by the other side's perceptions of data. The full extent and intensity of the controversy among the people of the EIS area are not known.

On one side of the controversy the uncontrolled spread of noxious weeds is also a concern. Some are concerned with (1) the spread of noxious weeds from BLM lands onto private, state, and other public land; (2) the economic losses from this encroachment; and (3) the effects of noxious weeds on native vegetation. Public interest also exists in cooperative programs of weed control. Concern over the spread of noxious weeds is expressed by county and state laws enacted to control noxious weeds.

The controversy is sustained by the following four factors. First, EPA has approved the chemicals for use and has provided instructions for safe handling and application. For some people this is the whole story. They see no basis for opposition to herbicide

use and they also see no reason for BLM to limit herbicide use or to entertain observations that the herbicides used for controlling weeds are used more often and in larger amounts for agriculture and home use than for noxious weed control.

Another factor is that some people are suspicious of the accuracy of EPA's determinations about herbicides. They fear that the approved herbicides may eventually be found to be as dangerous as other substances previously thought to be harmless. By then, they reason, it will already be too late to avert at least some harmful consequences.

A third factor that sustains the controversy is the difficulty in establishing scientifically, in a way that is comprehensible and believable to concerned individuals and interest groups, either the presence or the absence of cause and effect relationships between herbicide use and environmental damage or between exposure to herbicides and human health problems. This complicated scientific situation is important in three ways. In some cases (especially concerning long-term effects), the scientific evidence may simply be inconclusive. Therefore, questions concerning the effects of using a particular chemical, though they appear to be scientific questions, may have to be answered today in social and political terms. Conclusive scientific analyses may not be completed for years. Also, some segments of the public may distrust or reject sound scientific conclusions because they cannot understand the analytical process leading to the conclusions or because they have come to consider all scientific studies concerning herbicides to be inconclusive or dubious. Finally, some people criticize the fact that many studies of the health effects of herbicides are based on research with laboratory animals whereas their direct experiences of perceived impacts on people and wild and domestic animals seem to be ignored. A more extreme manifestation of this problem arises when parties to the controversy do not even agree on the identification of credible sources of information and analysis or on the definition of legitimate scientific research.

A fourth factor that helps sustain the controversy about herbicide use is that some people are increasingly concerned about not having control over their larger environment, including the management of BLM land resources. There is a growing sense that the nonprofessional public has a legitimate interest in how these land resources are managed. A traditional attitude of "leaving resource management to the professionals" is becoming less prevalent, and increasing numbers of people seem to want some say in how professionals do their job.

Just as social factors are linked to economic conditions, social factors are linked to other components of the environment such as air and water quality, rare and endangered plants, wildlife and recreation, and human health and public safety issues. For example, some are concerned about the safety of workers and the health of those directly or indirectly exposed to chemicals, with or without awareness of the exposure. Some are also concerned about contamination of water sources that are eventually used for irrigation, stock watering, domestic water supply, and fish hatcheries. These fears and anxieties appears to be directly related to the perception of scientific uncertainty about the existence of health risks.