

## Appendix H

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## AFFECTED ENVIRONMENT

### PURPOSE OF THIS CHAPTER

To describe the character and resources of the Wild and Scenic River corridor at the time of designation. The current conditions, as well as existing trends, are described to acquaint people with the corridor and provide a basis from which to assess the consequences of the various management alternatives.

### REGIONAL SETTING

Eagle Creek, is located in Baker and Union Counties in northeast Oregon, northwest of the town of Richland. The river flows from a glacial cirque at 7,448 feet, through the intensely glaciated, steep, rugged Wallowa Mountains, and then through a basalt canyon to its confluence with the Powder River at 2,100 feet. The Powder is a tributary of the Snake River, which in turn flows into the Columbia River, and then to the Pacific Ocean. The Eagle Creek watershed contains 156 square miles upstream from the lower boundary of the designated Wild and Scenic River corridor.

The creek begins at Eagle Lake, high on the slopes of the Wallowa Mountains in the Eagle Cap Wilderness on the Wallowa-Whitman National Forest. Eagle Creek is approximately 40 miles long. The upper 28.9 mile segment of Eagle Creek was designated as a Wild and Scenic River by the Omnibus Oregon Wild and Scenic Rivers Act of 1988. The designated segment begins below the earthen dam at Eagle Lake and ends 28.9 miles downstream at the Wallowa-Whitman National Forest boundary, 4 miles east of Sparta at the north side of Section 18, T.8S., R.45E., W.M. The upper 4.5 miles lie within the Eagle Cap Wilderness and has been designated a "Wild River" under the Wild and Scenic Rivers Act. From the Eagle Cap Wilderness boundary to Paddy Creek (16.9 miles) the river has been designated a "Recreational River", from Paddy Creek to Little Eagle Creek (6.0 miles) the river has been designated a "Scenic River", and from Little Eagle Creek to the National Forest boundary (1.5 miles), the river has been designated a "Recreational River". Within the Wild and Scenic River corridor, Eagle Creek ranges from 7,448 feet to 2,800 feet elevation.

The Eagle Creek drainage is bordered by drainages of the Powder River on the west, the Imnaha River and Minam River on the north, and the Pine Creek drainage on the east. The Imnaha and Minam Rivers and a portion of the Powder River are also National Wild and Scenic Rivers.

Major tributaries of Eagle Creek include West Eagle, East Eagle, and Little Eagle Creeks.

### CLIMATE

The climate in the general area is characterized by a short growing season and little or no summer precipitation. Annual precipitation within the river corridor varies significantly with elevation. Lower elevations receive approximately 20 inches of precipitation per year, while upper elevations exceed 60 inches of precipitation per year, much of it falling as winter snow.

Persistence of the snow pack varies primarily with elevation, generally melting within a few days of falling in lower areas and rarely maintaining a winter-long snow pack. At higher elevations, snow persists in patches through June and early July. A snowmelt hydrography typifies the streamflow with peak flows occurring in late May.

The summer months are typically dry with less than 15 percent of the of the annual precipitation falling during July, August, and September. The rain that usually occurs during the summer is the result of local thunderstorms. On any given day, air temperature variation is primarily a function of elevation. Summer temperatures near 90° F are not unusual in the lower reaches, while winter lows may reach well below zero. At higher elevations, summer temperatures fluctuate widely with hot days and cold nights. Summer highs reach the mid-70s at 5,000 feet and the mid-60s at 7,000 feet. At higher elevations, frost can occur almost any night of the year. Winter temperatures remain low for long periods and considerable snow accumulates.

### HISTORY

Written and oral history sources report the use of the Eagle Creek drainage by Native Americans pri-

pose to address the issue of navigability. Rather, this river plan is intended to provide a management philosophy for the above segment of the river, as well as the remainder of the river.

Under state law, the Division of State Lands (DSL) is responsible for the management of the beds and banks of navigable waterbodies (ORS 274.005 - 274.590). DSL is the administrative arm of the State Land Board (the Board), composed of the Governor, Secretary of State, and State Treasurer. Under constitutional and statutory guidelines, the Board is responsible for managing the assets of the Common School Fund. These assets include the beds and banks of Oregon's navigable waterways and are to be managed for the greatest benefit of the people of this state, consistent with the conservation of this resource under sound techniques of land management. Protection of public trust values of navigation, fisheries, and public recreation are of paramount importance, too.

The original Federal test for determining navigability was established in The Daniel Ball case over 100 years ago. This U.S. Supreme Court admiralty case clarified that rivers "are navigable in fact when they are used, or susceptible of being used, in their ordinary condition, as highways of commerce . . ." Interpreting this requirement, subsequent court decisions have adopted this test for title purposes and have ruled that a waterbody is navigable if it was capable of use, at the time of statehood, as a public highway for transporting goods or for travel in the customary modes of trade and travel on water.

The DSL has not made a determination concerning the navigability and state ownership for the beds and banks of Eagle Creek and the Federal test for navigability and court determination has also not been made. The position of the Forest Service is that navigability is a judicial finding and must be made by a Federal Court. Therefore, the Forest Service considers rivers non-navigable until proven otherwise. For purposes of managing the above portion of this river (where navigability has not been established), no special requirements will be pursued.

The DSL also administers the State's Removal-Fill Law which protects Oregon's waterways from uncontrolled alteration. The law requires a permit for fill or removal of more than 50 cubic yards of material within the State's waterways. The permit-review pro-

cess involves coordination with the natural resource and land use agencies from the local through the Federal levels.

As with any jointly managed resource, jurisdiction is not as important as care for the resource. The DSL and the Forest Service will continue to work together to assure that the public trust interest and the purpose of the Wild and Scenic Rivers Act are met.

Nothing set forth herein shall limit the ability of the Forest Service to administer this segment of river.

## **AMERICAN INDIAN TREATIES**

Eagle Creek is the boundary between lands ceded by the Confederated Tribes of the Umatilla Indian Reservation (Cayuse, Walla Walla, and Umatilla Tribes) on the west and the Nez Perce Tribe on the east.

The entire river corridor is within the lands that were ceded to the United States Government, through a ratified treaty, by the Confederated Tribes of the Umatilla Indians and the Nez Perce Tribe. The river corridor does not include any reservation lands. Under the provisions of the 1855 Treaty, members of the tribes retain specific rights and privileges on lands ceded by past treaties. These treaties entitle them to hunt, gather roots and berries, and pasture stock on nonclaimed (Federal) lands within the river corridor. In addition, these treaties entitle members of the tribes to fish at all usual and accustomed fishing sites. These tribes still continue to use the area for hunting, fishing, and other traditional practices at usual and accustomed places. The tribes also actively pursue protection of cultural and sacred sites, which include burials, and other treaty rights. Their rights to believe, express, and exercise their traditional religions (including having access to sites, use, and possession of sacred objects, and the freedom to worship through ceremonial and traditional rites) are also protected by law.

## **GRAZING**

Domestic livestock grazing began in the late 1800s when settlers grazed large sheep herds in portions of the watershed. The higher elevations were used for summer range while the lower portions, where mild winter conditions prevailed, were used for domestic livestock winter feeding grounds.

The Wilderness portion of the corridor and all National Forest lands north and/or east of Forest Road #77 upstream from the East Eagle/Eagle Creek confluence is part of the Sheep Rock Allotment and the Minam River Allotment. These are sheep allotments and have been vacant for over 15 years. There are no plans to open them up for grazing at this time.

Historically, sheep grazing was an important early industry in this region. Some excessive sheep grazing did occur in some area such as Bennett Peak in the early 1900s. Here, sheep grazing has resulted in some plant community alterations in the watershed. Sheep grazing continued into the 1960s but was characterized by much smaller bands used over a larger growing area. Many areas of past over-use, such as Bennett Peak, healed from improved allotment management. Market conditions, difficulty of getting sheep herders and loss of effective predator control methods led to the demise of the sheep industry in the Wallowa Mountains in the late 1960's. These conditions prevail today and there are further complications such as even more restrictive or no predator control options as well as complications and controversy over Bighorn Sheep reintroductions. It is unlikely that these two sheep allotments will ever be re-stocked by domestic sheep.

There are three active cattle allotments within the middle and lower portions of the river corridor the Eagle Valley Allotment, the Goose Creek Allotment, and the Trouble Gulch Allotment.

The Eagle Valley Allotment includes the east side of Eagle Creek downstream from East Eagle Creek and contains 33,670 acres.

The allotment has 586 head of permitted cattle for a four and one half month grazing season from June 1 through October 15 for a total of 2640 animal months of grazing. The allotment is managed under a deferred system. Livestock grazing occurs in the tributaries of Eagle Creek but livestock rarely venture to Eagle Creek itself. Livestock from the Eagle Valley Allotment getting into the main stream corridor of Eagle Creek has not been a problem in the past.

The Goose Creek Allotment is located on the west side of Eagle Creek downstream of the Eagle Creek bridge on Forest Road #77 and contains 30,175 acres. A total of 487 cattle are permitted on the

allotment for a 5 month season, from June 1 through October 30, for a total of 2435 animal months. Goose Creek cattle rarely get on the main stem of Eagle Creek. The topography adjacent to Eagle Creek and it's immediate tributaries is very steep with little livestock use. The steep slopes serve as natural barriers which prevent cattle from getting down to Eagle Creek. This allotment currently has a four pasture rest-rotation system in effect.

The Trouble Gulch Allotment is a very small 1,115 acre allotment located adjacent to the National Forest Boundary and on the west side of Eagle Creek downstream from Shanghi Creek. A total of 16 head of cattle are permitted on this allotment for a four month grazing season of June 1 through September 30 for a total of 64 Animal months. This allotment is used in conjunction with adjacent private lands and effects of this grazing have been negligible to recreation activities along Eagle Creek.

Other grazing in the river corridor is associated with horses used by recreationists, hunters, outfitters and guides, and by elk.

## **RESIDENCES, CABINS, AND RECREATIONAL SERVICES**

On the National Forest there are several structures within the river corridor. These include the Two Color Guard Station Rental Facility (with several outbuildings), just upstream from the Two Color Creek-Eagle Creek confluence, four Forest Service campgrounds (with picnic tables, fire rings, bulletin boards, and outhouses), several Forest Service Trailheads, seven recreational residences on special-use permit, and a stream monitoring gauge. On private land, there are approximately 20 summer homes along with outbuildings.

## **TIMBER**

Forests cover most of the National Forest System lands and most of the private lands in the river corridor. The upper 4.5 miles of the river corridor lies within the Eagle Cap Wilderness and all National Forest System lands within the area are withdrawn from timber harvest.

The current river corridor (1/4 mile each side of the mean high water line) lies in Management Area 7, Wild and Scenic Rivers, as specified in the Wallowa-

Whitman National Forest Land and Resource Management Plan (Forest Plan). Areas of Management Area 15, Old Growth, are scattered throughout the river corridor, with the highest concentration of these located in the Scenic River Section (between Paddy Creek and Little Eagle Creek). The river corridor within the Eagle Cap Wilderness also lies within Management Area 4, Wilderness. The four Forest service campgrounds and Two Color Guardstation Rental Recreation facility are in Management Area 16, Administrative and recreation Site Retention, and are also withdrawn from timber harvest. If conflicts arise between any of the provisions of these management areas within the river corridor the more restrictive apply.

Adjacent to the Congressionally designated 1/2 mile-wide river corridor area are several other Management Areas. Below the wilderness boundary, the river corridor is in Management Areas 6, 1, 3, and 3a. Management Area 6 includes the area just outside the river corridor between the Main Eagle Trailhead and the Wilderness boundary. This area is managed as backcountry and no regulated timber harvest is allowed. On the eastside of Eagle Creek, just outside the river corridor, from the Main Eagle Trailhead to Two Color Guard Station, the river corridor is in Management Area 3a. This area is managed for timber and wildlife winter range. Adjacent to the both sides of the river corridor below Shanghai Creek, and the eastside of the river corridor between Shanghai Creek and Paddy Creek is in Management Area 3, Wildlife Summer Range. The remainder of the area adjacent to the river corridor is in Management Area 1, Timber Production. Regulated timber harvest is allowed in Management Areas 1, 3, and 3a subject to the provisions in the Forest Plan. This includes converting unmanaged natural stands to vigorous managed stands. In Management 3 and 3a this constrained to meet wildlife objectives.

Commercial timber stands long the river corridor are primarily composed of grand fir and Douglas-fir, but Engelmann spruce, lodgepole pine, subalpine fir, cottonwood, and ponderosa pine contribute to the variety. On the mid and upper slopes western larch, aspen, and maple are included.

In general, the plant communities are in the mature to overmature successional stage. The major disturbance that formed the present stand structure were fires around the turn of the century. There are

two distinct size and age classes present across much of the area; one age group is 80-90 years old and is over-topped by an older overstory that survived the fires and ranges from 150-300 years old. Stands in many of the mixed conifer plant communities are converting to more the tolerant true fir species as a result of fire suppression. There are not many young stands present that have originated from recent disturbances, and the immature seral species are generally declining in number.

Stand productivity within the corridor varies considerably. The most productive types are the grand fir types. The productivity is directly related to the soil depth, moisture availability and plant community type. Generally the river bottom is the most productive. There are benches and sites on the mid and upper slopes that would rate high to moderate in productivity across all community types. The ponderosa pine and Douglas-fir sites are the least productive because they exist on drier soils and aspects. Management options will be limited on drier, shallow soil within the corridor.

In the absence of disturbance on mixed conifer sites, natural succession will result in the replacement of seral communities by the more shade tolerant climax species. Much of the area is tending toward its' climax condition. This will continue until severe disturbance, such as fire, windthrow, insects and diseases or silvicultural treatment create conditions favorable for establishment of shade intolerant species. Successional trends are important management considerations when trying to favor seral species. Observations suggest the following order of shade tolerance species, from most to least: subalpine fir, Engelmann spruce, grand fir, Douglas-fir, ponderosa pine, and western larch.

The stands within the corridor are being attacked by several damaging insect pests. The Douglas-fir tussock moth is a major defoliator of mixed conifer forests, showing equal preference for Douglas-fir, grand fir and subalpine fir. The western spruce budworm is causing significant defoliation and mortality and is showing persistence with year after year defoliation. The repeated defoliation is resulting in some growth reduction, top-killing and tree death.

Bark beetles are causing damage in unmanaged and overmature stands. The Douglas-fir beetle is causing increasing mortality to the Douglas-fir. The Mountain pine beetle attacks the pines and causes

most damage to overmature and overstocked stands of ponderosa pine and lodgepole pine. The western pine beetle, pine and fir engravers, and the spruce beetles continue to kill trees through out the corridor.

The most serious disease problem appears to be Indian paint fungus. This is a particular problem because of its occurrence in the large overstory grand fir along the corridor which are adjacent to many recreation sites and retention areas. Root rots and dwarf mistletoes are present and are a management concern.

Managed stands are those undergoing manipulation to meet some goal, usually to produce a "target" number of trees of a given species of defined diameter and height by a specific time. This goal is often attained through some combination of precommercial thinning and commercial thinning and perhaps suppression of competing vegetation early in the life of the stand. The existing condition of most stands in this assessment area would be classified as unmanaged, they are mature and overstocked with suppression and suppression mortality occurring. This is evident when reviewing density guidelines for the various plant community types. Opportunities exist to utilize mortality, maintain diameter growth and tree vigor along with meeting VQO values established in the corridor.

Existing volume figures in each stand indicate an approximate volume in the corridor of 90 MMBF. An estimate of yearly mortality is .6 MMBF/year.

Several National Forest timber sales have been conducted partially within or adjacent to the corridor and some incidental, light timber harvest has occurred on the private lands; however, these activities are virtually imperceptible from the river.

Recent harvest on the private lands near the East Eagle Creek confluence has included selection harvest over most of this 286 acre tract. Other than some temporary soil disturbance on skid roads and landings, evidence of the operation is not noticeable to most Forest visitors.

Past timber management and harvest activities in the river corridor have been minor and have caused little if any impact on the resources in the area.

## TRANSPORTATION

The upper 4.5 miles of the river corridor lies in the Eagle Cap Wilderness and is free of roads. Below the Wilderness boundary, there are numerous Forest Service roads in the river corridor. These include the main collector roads such as Forest Roads # 77, 7735, 7015, and 7755 which parallel Eagle Creek, and many local and spur roads. All of the corridor below the Main Eagle Trailhead is heavily roaded except for the 6 mile Scenic Section between Tamarack Campground and Little Eagle Creek. The river corridor also contains three National Forest road bridges and four private road bridges on Eagle Creek. The lower Forest Service bridge on Forest Road # 7015 is currently under reconstruction. The corridor also contains several Forest Service Road bridges on tributary streams such as East Eagle and West Eagle, and several Forest Service trail footbridges such as on Eagle Creek above Boulder Park and at Tamarack Campground, and on Little Eagle Creek at Eagle Forks Campground.

## SCENERY

The diversity of landforms, water, color, and vegetation present throughout the designated portion of Eagle Creek is one of the most attractive attributes of the river corridor. The landscape character is formed by a variety of elements. Rock outcroppings are abundant and at times dramatic. Dark forested hillsides facing north are contrasted by south facing grassy slopes that are sparse of trees. The valley floor alternates between flat meadows and narrow gorges as the river changes from calm, meandering and sometimes deep, to swift and shallow.

The headwaters of Eagle Creek originate high in a glacial cirque in the Eagle Cap Wilderness. From its beginning at the outlet of Eagle Lake, the creek follows a steep gradient over small waterfalls and bouldery white water rapids as it descends from the mountains. Vegetation in the classic u-shaped glacial valley alternates between high mountain meadows and stands of sub-alpine fir and whitebark pine. Expansive views of the surrounding Wallowa mountains are afforded from every meadow opening. Numerous avalanche chutes, landslides, waterfalls, and scoured rock outcrops create a highly diverse and dynamic landscape that vies for attention with the crystal clear creek.

The valley floor becomes relatively flat and wide at the Main Eagle Trailhead, and for the next five miles Eagle Creek temporarily slows in its rapid descent from the high mountains. Clear blue-green pools alternate with rapids as the creek winds its way through lush green, boulder-strewn meadows and park-like forests. Vegetation and canyon walls generally limit views to the immediate foreground except for the breathtaking views of the mountains seen from the northern end of the road.

Eagle Creek leaves a landscape dominated by glacial features below its confluence with West Eagle Creek. For approximately the next 10 miles, the valley closes in and canyon walls become abruptly steep, towering 500-1000' above the valley floor in places. Eagle Creek resumes its fast-moving, bouldery descent through the narrow canyon, bordered by lush riparian vegetation and picturesque meadows. Dramatic rock formations extending from rim to canyon floor punctuate otherwise forested hillsides. The road paralleling Eagle Creek offers unrestricted views of the creek in the immediate foreground and surrounding hillsides.

The lower seven miles of the designated portion of Eagle Creek takes on a character more typical of eastern Oregon rivers as it enters the lower elevation basalt-dominated plateaus surrounding the Willowa Mountains. Mixed conifer forests are replaced on drier slopes by grassy openings and park-like stands of ponderosa pine. Unusual rock formations provide visual contrast. By this time Eagle Creek has become substantial in size from the contributions of several major tributaries, and alternates between bouldery rapids, short waterfalls, smooth swift stretches, and deep blue pools. Visitors can enjoy views of the creek and canyon from the Martin Bridge Trail which parallels the six-mile scenic segment of Eagle Creek, and from Forest Road #7735 which parallels the lower 1-1/2 mile recreational segment.

Throughout the corridor, seasonally abundant wildflowers color the streambanks, cliffs, and forest floor with splashes of red, purple, yellow, white and blue in the spring and summer. Deciduous vegetation including cottonwood, aspen, ninebark, and bracken fern provide attractive contrasting fall colors. Western larch provide a dramatic color contrast in the forest in the late fall as they turn golden, and in the springtime as the new green needles emerge. Picturesque stands of ponderosa pines and other

large diameter trees can be seen in places throughout the corridor, including several designated old growth stands.

Human impacts in the Eagle Creek corridor are fairly limited and generally remain subordinate in the landscape. These include several dozen rustic-appearing summer homes and mine structures on private land, six ponds and a ditch system to connect them on private land, the road and a few road and trail bridges, a historic guard station/work center, posts marking an underground telephone system, seven recreation residences on special-use permit, and several small campgrounds and trailheads. Numerous dispersed campsites are visible along the banks of the creek. Some incidental, light timber harvest has occurred on the private lands in the past, and several National Forest timber sales have been conducted partially within or adjacent to the corridor; however, these activities are virtually imperceptible from the river or the road system along the river. Probably the most noticeable human impact along Eagle Creek are the road cuts and fill slopes on the National Forest and an occasional cut for placement of summer homes, which are occasionally visible from the river. In spite of the continuing interest Eagle Creek has received since before the turn of the century, the river corridor still presents an overall natural and pleasing landscape to viewers. In fact, the outstanding and unaltered scenery of Eagle Creek attracted the attention of movie producers, who used the area as a filming location for "Paint Your Wagon".

The distance zones in the viewshed are primarily foreground with very little middleground and minimal background. The variety class is A, "Distinctive", due to the variety of the stream character, vegetation rock outcroppings and steep canyon walls. The sensitivity level is designated as Level 1, and the visual objective is Preservation in the Wilderness portion of the river corridor and Retention throughout the remainder of the area.

## RECREATION

The Eagle Creek corridor provides a wide variety of recreational opportunities. Based on field observations and use records, Eagle Creek receives a considerable amount of use beginning as soon as the snow melts in the spring and continues into the late fall hunting season(s). A large portion of the visitors

are from the local area, although some visitors come great distances to recreate in the Eagle Creek drainage, drawn by the exceptional scenery, excellent fishing, clean water, and the broad range of recreational opportunities available.

Primary activities recreationists engage in are fishing, hunting, camping, sightseeing, hiking, and picnicking. Dispersed camping associated with fishing, hunting, and prospecting is very popular, evidenced by the numerous dispersed campsites within the roaded corridor. Other less pursued activities include horseback riding, photography, nature study, swimming, wildlife viewing, berry and mushroom picking, and various winter sports such as cross country skiing and snowmobiling. The Main Eagle Trailhead is a major south side access route into the Eagle Cap Wilderness, providing opportunities for solitude and primitive recreation experiences in a Wilderness setting. Hazardous whitewater, waterfalls, and low seasonal flows preclude floating or kayaking opportunities.

The entire designated portion of river is accessible by either gravel road or trail. Good quality gravel roads parallel the recreational segments of the river. The Main Eagle Trail (FS #1922), a wilderness trail that parallels the wild river segment for 3 miles from the Main Eagle Trailhead, and connects with the Eagle Lake Trail (FS #1931) which provides access to the headwaters at Eagle Lake. The other trails include the Eagle Lake Trail (FS #1931), the Lookingglass Trail (FS #1921), and the Bench Canyon Trail (FS #1937). The unroaded six-mile segment of Eagle Creek is paralleled by the Martin Bridge Trail (FS #1878), providing anglers, hikers, and hunters access from early spring to late fall. Several other trails which begin in the vicinity of Two Color Guard Station, the Fake Creek Trail (FS #1914) and the Two Color Trail (FS #1932), provide access to the surrounding foothills that are adjacent to the W&SR corridor. All the trails in the corridor are maintained at a Difficulty Class of "More Difficult" with the exception of the Main Eagle Trail which has a Difficulty Class of "Easiest". A portion of the river road is part of a popular maintained snowmobile route during the winter months.

Recreation developments in the corridor are fairly limited and generally primitive in design-consistent with the ROS settings (Development Level 3). Four small developed campgrounds, Eagle Forks, Tamarack, Two Color, and Boulder Park provide a devel-

oped camping and picnicking experience in a primitive setting. Eagle Forks has 7 tent/trailer sites and several picnic sites. Adjacent, is the trailhead and a footbridge for the Martin Bridge Trail. The Tamarack Campground has 14 tent/trailer sites, a footbridge over Eagle Creek, and provides fishing access, fishing platforms, and camping and picnicking opportunities for physically-challenged visitors and their families. The Two Color Campground has 14 tent/trailer sites, and the Boulder Park Campground has 6 tent/trailer sites.

The river corridor contains the Main Eagle, Fake Creek, and Martin Bridge Trailheads which have signs and parking. The Main Eagle Trailhead (formerly called Boulder Park) has recently been reconstructed to add the Boulder Park Campground, and to improve the toilets, stock facilities, vehicle turnaround, viewpoint access, and long-term parking. This provided unloading and camping facilities for parties with horses and minimized the potential conflicts in other developed campgrounds.

The river corridor contains the Two Color Guard Station which is available for public recreation rental. A wide variety of groups and individuals rent the site for periods from a few days to a few weeks at a time, with weekly rental being the most common.

Dozens of informally dispersed camping areas in the river corridor receive heavy use, throughout the summer and fall, in association with hunting, fishing, and mining. Additional dispersed campsites are available nearby in the West Eagle and East Eagle drainages. Some of the Eagle Creek sites and access roads are poorly located and may be incurring some resource damage. The condition of dispersed sites in the corridor needs to be inventoried and evaluated.

A variety of recreational development projects are identified in the Forest Plan for the Eagle Creek corridor. These include the reconstruction of the Boulder Park campground to add 5 more sites with corrals, the Two Color and Eagle Forks Campgrounds to improve safety, resource protection, and to better accommodate existing use. Also included is the addition of additional trailer camping sites, improvement of Two Color Guardstation, and installing interpretive signing at a viewpoint overlooking a natural landslide that occurred on the east side of Eagle Creek in 1982 (see Geology/Paleontology section).



There are exceptional opportunities to develop interpretive sites or tours to explain the area's unique natural and cultural history. Interpretation of the area's gold mining history could be developed to compliment the other nearby historic sites such as the Oregon Trail Interpretive Center, potentially attracting visitors from outside the geographic region and enhance their recreational experiences. Other potential projects that have been discussed for the river corridor include an interpretive trail on the historic Sparta Ditch location, an interpretive display at the Martin Bridge stage stop site, and other interpretive materials or displays covering the area's geologic features, natural history, and cultural history.

The existing Recreation Opportunity Spectrum (ROS) for the river corridor includes three ROS class settings and two Wilderness Resource Spectrum (WRS) sub-classes. The majority of the corridor classifies as Roaded Natural (RN) ROS setting. The small unroaded portions outside of Wilderness generally classify as Semi-Primitive Non-Motorized (SP-NM) and Semi-Primitive Motorized (SPM). Within the Wilderness, the river corridor is classified as Semi-Primitive WRS from the trailhead to the vicinity of the Bear-Culver Lake Trail junction, and Primitive WRS class beyond that to the headwaters.

The river corridor contains seven recreational residences under special use permit near Main Eagle Trailhead. The current permits are in effect through 1999. Forest Plan direction is to not issue permits on new lots or re-issue permits on existing lots as they become vacant.

There are currently two outfitters from the Richland/Halfway area who take guide progressive pack trips (horse and llama) in the Main Eagle drainage. Outfitter permits are being held at the current level until the Wilderness Management Plan is completed in Fiscal Year 1995.

Recreational stock use in the corridor is moderate and currently unregulated. Dispersed use and recreational livestock use has grown over the past few years in the river corridor. This growth in activity and use has had only very minor impacts on riparian areas, vegetation, water quality, soils, and the quality of the wilderness experience in the area.

The quality and diversity of recreational opportunities available along the Eagle Creek corridor makes

it a popular area almost year-round. Since surveys of recreational use have not been conducted specific to the river corridor, recreational use levels are estimates based on field observations and general use records. It is estimated that the corridor currently receives heavy use from early summer through fall big game hunting seasons, and light use winter through early spring. Traffic on the first few miles of the Main Eagle Trail is heavy, where day hikers and anglers are frequently encountered. Use drops off and disperses as one travels further into the Wilderness and passes several trail junctions, and the users encountered are primarily backpackers and horse parties.

The development and marketing of the tourism industry has the potential to increase demand for additional recreational facilities in the Eagle Creek corridor. New recreational developments adjacent to the corridor, such as Lily White Guard Station rental facility, could also effect the recreation use patterns in W&SR corridor.

There may be a need to implement buffers on campsites from the stream corridor within the wilderness. Outside of wilderness, there may be a need to consolidate campsites, close dispersed sites which impact the waterway, stabilize or enhance slope failures, and enhance or obliterating road systems which are depositing sediment into Eagle Creek.

## **GEOLOGY AND MINERALS**

Eagle Creek begins high in the southern Wallowa Mountains, an area with a complex geologic record. The granitic Wallowa batholith dominates in the upper Eagle Creek drainage. The Wallowa Mountains were glaciated at least three times and perhaps as many as seven times between 11,000 and 500,000 years ago. The numerous cirque lakes, steep ridges, and craggy peaks in the upper Eagle Creek drainage were created by the sculpting of valley glaciers flowing out from a central point near Eagle Cap Mountain. Visible in the upper and middle reaches of the Eagle Creek drainage are metamorphosed greenstones and tuffs, sedimentary rocks of the Clover Creek formation, fossiliferous limestones of the Martin Bridge formation (known locally as black marble), and slates, shales, and sandstones of the Hurwal Formation. The three formations represent ancient sea floor sediments formed about 100 million years ago. The rock pinnacles just

south of Paddy Creek are limestone spires of the Martin Bridge formation. Widespread volcanism occurred 15-30 million years ago, which resulted in the formation of basalt plateaus surrounding the Wallowa Mountains uplift. The lower end of the scenic and the recreational portion of Eagle Creek is dominated by columnar-jointed olivine basalts of the Columbia River Basalt Group. Feeder dikes from some of the local eruptions can be seen exposed in the older rocks and in the glacially carved granites in the upper glaciated reaches of Eagle Creek.

As is typical throughout the Wallowa Mountains, the river valley is geologically unstable. Freezing and thawing contribute to periodic rockslides along cliffs in the drainage, with a recent occurrence evident the northeast of the Main Eagle trailhead. Occurring in 1982, this substantial slide brought down large amounts of rock and soil from a height of about 1,000 feet, crossing and temporarily blocking the stream, and ultimately coming to rest on the opposite side of the valley in the immediate vicinity of the old trailhead. The trailhead has since been relocated downriver approximately 1/4 of a mile to a more stable area. The new turnaround at the trailhead offers an excellent vantage point to view this impressive natural landslide.

The ancient sea floor sediment formations found in the Eagle Creek drainage contain the silicified shells of oyster-like bivalves, and fragments of corals and sponges. At least one significant paleontological discovery has been made in the corridor in the recent past. The oldest vertebrate fossil to be discovered in Oregon was found in the Eagle Creek corridor, which pushed back the known geologic record of vertebrate animals in the state by 50 million years. The corridor continues to be a focus of interest for paleontology field classes and scientific research.

Eagle Creek flows through the border zone of the Wallowa batholith, which in places has been mineralized and contains deposits of gold, silver, and copper. The erosion of these mineral-bearing rocks has resulted in the deposition of placer gold in the alluvial benches and stream gravels of Eagle Creek and its tributaries. Much of the early interest in Eagle Creek was related to gold. Since the discovery of gold in the region around 1860, at least 10 properties have been worked in the Eagle Creek mining district, a large area encompassing the Eagle Creek drainage and its tributaries. Production from other lode deposits in the mining district has been small.

Today, gold mining is a well-established activity in the Eagle Creek corridor, and a majority of the drainage is currently under claim. Other minerals such as silver, copper, lead, and zinc have also been produced in small quantities.

The river corridor of Eagle Creek contains 250 to 300 mining claims. One could say the entire length of the creek from the wilderness boundary to the forest boundary is claimed up. However, plans of operation have been submitted only on the portion from East Eagle confluence south to the forest boundary. Pine Ranger District receives approximately 10-12 operating plans on this segment of the creek annually. A majority of these claims fall within the "recreational mining" category in that this activity represents a broad cross section of the public who undertake this activity for the primary purpose of seeking an outdoor recreational experience and not as a means of income. It is defined as a leisure activity that involves the search for and collection of mineral specimens using gravity separation methods in a fashion that does not disturb surface resources. Recreational panning, sluicing or dredging is recognized as a legitimate recreational activity on the National Forests.

When the activity occurs on a valid mining claim it is administered under the 36 CFR 228 mining regulations and 1872 Mining Law. An operating plan is sought but not mandatory for this level of disturbance.

Since the entire corridor is virtually "claimed" the recreational miners without claims have no place to operate. Eagle Forks Campground was designated as a recreational mining site on Pine district, because it shows "color" and is withdrawn from mineral entry. This also means administration of this segment of public use does not fall under general mining law. So far no user conflicts have arisen nor resource damage to the campground occurred. Designation of the campground as a recreational mining site occurred before Wild and Scenic River designation.

Another potential problem related to mining and the corridor is the use of the dispersed camping sites along the riparian area by the recreational miners. The segment of Eagle Creek between the East Eagle confluence and Paddy Creek is inundated by miners on their claims for most of the summer season.

## FISHERIES AND WATER QUALITY

### Hydrology

Eagle Creek has evolved through many natural disturbances (erosion, volcanics, glacial, etc.) to develop the geologic and hydrologic features it has today. Within the Wilderness portion of this drainage the natural hydrologic features are the least impacted and nearly pristine.

This system has a near natural flow regime which is notable for a watershed of this size in the western states (156 square miles). The quality of this waterway is primarily due to its high elevation existence which makes access difficult. This allows it to maintain a near pristine condition and minimal impacts in its upper most 11 miles of stream. The sections of river below this have been impacted but not to any significant affect. This watershed is considered to be in "Class One" condition according to Forest Service Manual 2521. This means that it is at or above its potential. It also meets the requirements to be rated a "Class One" stream. This means that it is a perennial stream utilized by salmonids.

The natural flow regime of the designated section has been slightly altered by minor diversions and small irrigation dams on several high mountain lakes at the headwaters of Eagle Creek and tributaries. For example, in the early 1900s a small foot earthen dam was constructed across Eagle Lake's outlet on the south end, to store water for release later in the season. This lake reservoir was created to provide irrigation for agricultural lands in the Powder Valley, as well as to provide some water for domestic use. There is also a small diversion on Eagle Creek for a series of 6 ponds on private property on the Hideaway Hills Tract. This diversion is small compared to the natural flow of Eagle Creek.

The river corridor also contains an old historic irrigation diversion, the Sparta Ditch, which at one time provided water to the Sparta area from Eagle Creek. The ditch has been abandoned for many years and no longer contains water, but is still visible and contains several tunnels and flumes. The old ditch starts in the river corridor above the Two Color Campground and leaves the river corridor 1/2 mile west of the mouth of Eagle Creek.

Eagle Creek runs swift and clear during normal flows. As is typical for a snowmelt-fed stream, natural runoff patterns are seasonal. Peak runoff occurs in spring, generally March to June. Runoff recedes to low flows by late summer, and increases again in late fall in response to the fall rains. Ice damming and significant ice flows are common occurrences in late winter and spring. Evidence of flash flood events can be observed following severe summer thunderstorms.

Due to the high elevation of the upper drainage, water temperatures remain cold well into the summer months. Water quality is excellent. Dissolved oxygen levels are high and suspended sediment concentrations low during normal flows and moderate during high flows.

Water discharge for Eagle Creek has been monitored continuously by the US Geological Survey (USGS) from 1959 to present (gauging station 13288200). The station is located just upstream from the southern end of the Wild and Scenic River corridor. The average river discharge through the 1992 Water Year was 313 cfs. The lowest flow on record is 30 cfs on November 28, 1976. The maximum discharge occurred on July 12, 1975, and measured 5,310 cfs (USGS Water-Data Report OR 92-1, 1992). The average monthly mean, maximum, and minimum flows recorded for Eagle Creek for the 1992 water year and averaged from 1957 through 1992 are listed in Chart H-2.

## CHART H-2

### POWDER RIVER BASIN

13288200 EAGLE CREEK ABOVE SKULL CREEK, NEAR NEW BRIDGE, OR

LOCATION.--Lat 44°52'50", long 117°15'10", in SE 1/4 sec.7, T.8 S., R.45 E., Baker County, Hydrologic Unit 17050203, Wallowa-Whitman National Forest, on left bank 0.5 mi upstream from Skull Creek, 6.5 mi northwest of New Bridge, and at mile 10.5.

DRAINAGE AREA.--156 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1957 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 2,800 ft, from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are poor. No regulation. Some diversions upstream from station for irrigation and one small interbasin diversion for irrigation supply. All diversions are small compared to flow at station during irrigation season. Continuous water-quality records for the period June 1959 to September 1961 have been collected at this location.

AVERAGE DISCHARGE.--35 years, 313 ft<sup>3</sup>/s, 226,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,310 ft<sup>3</sup>/s July 12, 1975, gage height, 5.06 ft, from rating curve extended above 2,500 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; maximum gage height, 6.88 ft Jan. 25, 1962 (ice jam); minimum daily discharge, 30 ft<sup>3</sup>/s Nov. 28, 1976.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,700 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
May 7	2300	*1,150	*2.98				
Minimum discharge, 58 ft <sup>3</sup> /s Sept. 23, 24.							

#### DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	82	80	112	81	93	224	312	646	537	261	103	70
2	81	76	113	84	92	225	364	616	576	224	99	69
3	81	73	96	81	90	230	422	638	530	211	98	66
4	81	86	95	90	90	242	452	686	464	192	101	68
5	81	136	94	84	91	235	405	751	422	182	100	68
6	81	175	110	88	91	227	364	825	382	182	100	66
7	81	108	108	75	91	249	334	921	367	178	99	66
8	80	105	99	107	91	238	313	928	368	164	99	66
9	79	112	95	*125	91	228	323	755	377	155	97	65
10	79	103	93	*117	92	225	323	664	380	149	94	63
11	79	98	89	*110	97	227	304	598	368	144	92	63
12	78	140	97	*115	101	239	330	536	387	138	91	63
13	78	149	87	*110	122	260	398	491	382	132	89	62
14	78	117	97	*105	117	281	388	515	319	126	85	63
15	78	104	125	*97	117	306	370	582	298	121	85	62
16	77	103	152	*86	114	310	385	613	274	118	92	61
17	74	110	164	*76	110	288	475	634	260	127	91	61
18	75	105	159	*72	107	270	446	699	257	132	88	60
19	75	101	137	*88	121	258	407	706	264	128	88	60
20	75	109	108	*100	217	251	405	720	275	129	83	60
21	75	104	144	*112	218	254	421	623	276	133	81	60
22	75	87	146	*110	210	256	398	583	272	131	82	59
23	75	90	134	*105	188	239	373	588	264	139	85	59
24	76	101	137	*92	173	262	362	634	254	130	82	57
25	80	102	149	*80	173	264	369	683	248	124	81	83
26	88	102	147	84	181	275	420	805	277	116	78	76
27	82	102	120	88	192	266	476	709	239	112	76	72
28	78	97	93	102	203	261	540	619	239	111	74	70
29	77	95	89	101	215	260	668	573	307	109	72	68
30	70	89	90	96	---	264	724	547	264	107	72	66
31	79	---	83	94	---	277	---	522	---	105	71	---
TOTAL	2428	3159	3562	2955	3888	7911	12271	20410	10127	4510	2728	1962
MEAN	78.3	105	115	95.3	134	255	409	658	338	145	88.0	65.4
MAX	88	175	164	125	218	310	724	928	576	261	103	83
MIN	70	73	83	72	90	224	304	491	239	105	71	59
AC-FT	4820	6270	7070	5860	7710	15690	24340	40480	20090	8950	5410	3890

\* Estimated

#### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1958 - 1992, BY WATER YEAR (WY)

MEAN	107	124	115	110	123	186	417	911	1003	406	145	105
MAX	323	264	211	191	230	493	658	1747	2134	1011	253	172
(WY)	1960	1974	1959	1974	1963	1986	1990	1958	1974	1975	1983	1978
MIN	56.1	67.9	72.3	58.9	72.0	64.8	191	252	276	84.0	62.8	61.4
(WY)	1989	1988	1977	1977	1966	1977	1967	1977	1977	1977	1977	1988

#### SUMMARY STATISTICS

	FOR 1991 CALENDAR YEAR	FOR 1992 WATER YEAR	WATER YEARS 1958 - 1992
ANNUAL TOTAL	92423	75911	
ANNUAL MEAN	253	207	
HIGHEST ANNUAL MEAN			313
LOWEST ANNUAL MEAN			519
HIGHEST DAILY MEAN			118
LOWEST DAILY MEAN	1280	928	3400
ANNUAL SEVEN-DAY MINIMUM	62	59	30
ANNUAL RUNOFF (AC-FT)	69	60	48
10 PERCENT EXCEEDS	183300	150600	226800
50 PERCENT EXCEEDS	728	498	839
90 PERCENT EXCEEDS	128	113	139
	80	75	80

The major cause of sedimentation in Eagle Creek is a result of the geologic instability of the Wallowa Mountains, especially above Boulder Park. Rock formations have been tilted to angles between between 45 and 70 degrees. This geologic instability combined with heavy snows and freezing and thawing contribute to periodic rockslides and debris torrents along cliffs and streams in the drainage. The most recent of this major activity was a landslide at Boulder Park on Eagle Creek in 1982 in which a 1,000 foot strip of the hillside slid down across Eagle Creek temporarily blocking flows, and a series of debris torrent at Sullivan Creek on East Eagle in the mid-1970s which brought down large amounts of rock and soil from a height of about 2,000 feet, crossed and temporarily blocked the stream, and destroyed the river bridge. There are also numerous other examples of floods, slides, and debris torrents along East Eagle Creek and the river has numerous braided and abandoned channels, meanders, and gravel bars as a result of this action.

Since the 1860's, human-caused activities have occurred within the corridor which have impacted the watershed. These activities include road construction, mining, timber harvest, and grazing of sheep and cattle. Roads are considered the largest non-natural contributor of sediment to the stream system. Construction of roads within the Eagle Creek watershed increased sedimentation rates, which in turn increased surface fines and substrate embeddedness. Impacts from other past activities have affected the watershed and resulted in some degrading of the water quality of Eagle Creek but overall impacts are minor.

The roads along with dispersed recreation use has caused some minor disturbance to the stream bed and banks. For example there have been some minor slope failures along some of the Forest System roads paralleling the stream (ie. upstream from O'Brien Creek Forest Road #77). Several dispersed camping sites and developed sites such as Tamarack Camp Ground, Two Color Camp Ground, and Forest Road #7755(075) have been impacted by recreation use. These impacts include compacted soils and dispersed trails in the riparian area. A natural slide occurred at Boulder Park in 1982 has left some unfavorable conditions. These conditions include a lack of vegetation, no designated riparian area, increase in sediment, impassible falls for fish, and unstable stream conditions. Other impacts in-

clude some site disturbance and degraded riparian zones from dispersed use within the Eagle Cap Wilderness between the Culvert Lake tributary and Cache Lake tributary. There have also been several "full bench" cuts on private land to place summer homes next to the river which have not been stabilized and are causing erosion.

## Fisheries

### Populations

Eagle Creek supports populations of native and stocked rainbow trout, eastern brook trout, bull trout, and non-game species including mountain whitefish, and sculpin. Fishing for both native and stocked trout is a popular recreational activity in Eagle Creek. The Oregon Department of Fish and Wildlife (ODFW) currently stocks the creek with approximately 9,000 rainbow trout annually from mid-June through mid-August. Bull trout (*Salvelinus confluentus*) is listed on the Regional Forester's Sensitive Species List, and is listed as a candidate threatened and endangered species (Category 2) species by the U.S. Fish and Wildlife Service (USFWS). Historically, bull trout populations had a wide distribution in Oregon, but many populations are extinct or near extinction. The existence of bull trout in Eagle Creek has been documented; however, the extent and viability of bull trout population in Eagle Creek is unknown at this time. Eagle Creek provides the specific habitat requirements for bull trout, which are dependent on cold, high quality water.

Eagle Creek was thought to be the most important anadromous fish producing tributary in the Powder River basin (Thompson and Haas 1960). Spring chinook and summer steelhead were the primary anadromous fish species present until the construction of the Hell's Canyon Dam complex in the 1960's. Significant chinook spawning areas were documented in the stretch of Eagle Creek from Boulder Park to Two Color Guard Station, and from Paddy Creek to one mile below Little Eagle Creek. Peak downstream movement of chinook juveniles, based on incidental catches at irrigation screens occurred in September, October, and November. Eagle Creek was regularly visited and fished by members of several Native American tribes historically, and although anadromous fish are now extinct in Eagle Creek, Native Americans still travel to the area to fish and camp. Long-time local residents still

can recall the excellent fishing Eagle Creek once provided.

Very little was known about steelhead use, though they were thought to be widely distributed in Eagle Creek and its tributaries. Peak downstream migration occurred in August, September, October, and November.

Eagle Creek does not presently contain anadromous fish; however, presently there is some interest in reintroducing anadromous fish (i.e. spring chinook) to Eagle Creek. However, irrigation withdrawals in the lower ten miles cause extremely low flows near the mouth of Eagle Creek. The lack of adequate flow during the irrigation season is one of the major challenges to re-introducing chinook into main Eagle Creek. In addition to the low flows in lower Eagle Creek, any introduced stocks would have to be transported around the Hell's Canyon dam complex or confined to rearing to maturity in Brownlee Reservoir. Chinook stocks which remained in freshwater for their entire life cycle, would not be expected to reach the size of fish which rear in the ocean environment. The re-introduction of steelhead would require a method to pass the fish around the Hell's Canyon dam complex, so that they could travel to and from the Pacific Ocean.

#### *Habitat*

Habitat for fish is of generally good to high quality despite a variety of factors which have locally affected habitat conditions.

From its headwaters at Eagle Lake, the stream follows a steep gradient in the upper five miles, losing an average of 432 feet per mile, and an average of 113 feet per mile over the rest of the Wild and Scenic River corridor. The waters of Eagle Creek are highly-oxygenated, cold and clear, and water quality is excellent, due in part to the undeveloped upper 11 miles, and to undeveloped tributary reaches, which begin mostly within the Eagle Cap Wilderness.

Habitat conditions in the upper reaches of Eagle Creek within the Wilderness are excellent, and have been minimally impacted by the low dam at the outlet of Eagle Lake (headwaters of Eagle Creek), minor trail building, wood removal, and vegetation disturbance due to the development of campsites along the stream banks. This undeveloped river

reach is important for providing the high quality, cold water downstream.

The remainder of the river corridor, with the exception of a six-mile unroaded portion, has been altered somewhat by road construction. This has diminished the quality of habitat due to encroachment of road fill, rip-rapping, channel straightening, sediment delivery to the stream, removal of streamside shading vegetation, and removal of in-stream woody debris. Mining activities have a short seasonal impact on water quality by temporarily increasing sediments in the stream. Additionally, portions of this lower reach fall within three active cattle grazing allotments. The riparian zone is considered to be of fair to good quality within allotment boundaries.

Overall, there is good variety of deep pools, glides, and riffles which provide ample spawning, rearing, and holding habitat for native and stocked trout species, and potentially for reintroduced anadromous fish. Relatively moderate disturbance to Eagle Creek's stream bed and banks has occurred; however, good-to-high quality habitat for native and hatchery trout is still present. In addition, Eagle Creek meets the specific habitat requirements for bull trout, a species that is dependent on cold, high quality water.

There is some potential for restoration or improvement of habitat conditions through improved control of activities within the floodplain and riparian area, as well as some potential for improvement of water quality from major tributaries entering the mainstem which would benefit the designated portion of the river.

Current habitat conditions are based on a Forest Service stream survey conducted on the lower portion of Eagle Creek in 1990 (Forest Service boundary to O'Brien Creek) and on the upper portion in 1991 (O'Brien Creek to Eagle Lake). The survey used Region 6 Hankin/Reeves stream inventory methodology.

The survey found the majority of stream had a moderate amount of pool habitat. The lower portion of Eagle Creek (from the Forest Service boundary to O'Brien Creek) averaged three pools per mile while the upper portion (from O'Brien Creek to Eagle Lake) averaged six pools per mile.

Average stream shade was (0-19%) which is poor, but this is a result of wide stream channels. This leaves a large section of the stream to be shaded by topography or streamside trees. The Forest Plan requires 80% stream shade for productivity which was not met. This is due to a wide stream channel which leaves a large section of the stream to be shaded by vegetation or topography. The Wallowa-Whitman National Forest Land and Resource Management Plan (LRMP, 1990) has set a standard of 60 to 100% stream shade which Eagle Creek does not meet. The Region 6 Hankin and Reeves Level II survey quantifies shade provided by vegetation and does not take into account shade provided by topography. During the 1991 Eagle Creek survey (O'Brien Creek to Eagle Lake) shade angles were taken approximately every one third mile. Shade angles are a measure of the percent of open sky which takes into account shade provided by vegetation and/or topography. Average percent open sky for the 1991 survey was 54%. Extremely high percentages of open sky (70 to 100%) relate to severe shade deficiencies. Since Eagle Creek has been determined to have low levels of shade provided by riparian vegetation, the 54% value is a measure of topographic shading. The 54% value shows that topography is a major component of shade in the Eagle Creek basin. No shade angles were taken during the 1990 survey. No historical shade data is available to determine if Eagle Creek has ever been within the LRMP standard of 60 to 100%. Riparian vegetation has been impacted in Eagle Creek basin and shading provided by vegetation reduced.

Stream temperatures met water quality standards with an average between the the two surveys of 61 degrees Fahrenheit (includes 1953-1959 data from Thompson and Haas). The stream was surveyed during the warmest part of the year so temperatures should not increase.

The stream banks of this system does not meet the Forest Plan objective of 80% stable banks yet the system averaged 50% stability which is fair.

This system had an average of 43% embeddedness which is which is slightly above the 35% embeddedness level considered as maximum for successful salmonid spawning and rearing.

The river is relatively undisturbed in recent times and is in fairly healthy overall condition. It is lacking in woody debris, which may be due to high flows

during spring run-off which would transport debris downstream. It also has poor shading and cover both of which are typical for a larger river.

The establishment of numeric desired future conditions ("DFC's") for riparian and instream habitat parameters is necessary for providing guidance for future rehabilitation or enhancement of the stream environment. The establishment of DFC's for all Columbia River Basin anadromous fishery streams is required as part of the Tri-Regional Anadromous Fisheries Habitat Management Policy (1991). Streams such as Eagle Creek, where the anadromous runs are considered extinct, are not currently required to have established DFC's. However, the DFC's chosen for other anadromous fishery streams on the Wallowa-Whitman National Forest could be applied to Eagle Creek. Those DFC's may need minor changes to take into account the presence of resident trout species, i.e. those values must be specific to the desired fish species and life stage. It is likely that a range of desired values will be provided for pool frequency and quality; the amount of large woody debris (LWD); percent surface fines; bank stability; and riparian vegetative potential or condition. Survey information can then be used to compare the current condition of Eagle Creek to the desired future condition, thus helping to guide future management activities which will protect or enhance the outstandingly remarkable values identified for fisheries.

Those outstandingly remarkable values which have been identified for Eagle Creek include excellent resident and stocked trout angling opportunities, the possibility of re-introduction of anadromous fishes, relatively stable flow regime, optimal temperatures for salmonids, significant amount of glide habitat, and near optimal habitat values for bank stability, pools, and hiding cover in some reaches of Eagle Creek.

Roads and dispersed sites are two of the primary impacts to the riparian area on Eagle Creek, which may be causing impacts to the instream fisheries habitat. The 1991 stream survey located several dispersed sites in sensitive riparian habitat, including impacts in the "Wild" segment from stock and people use of the riparian area. Much of the road mileage in the Wild and Scenic corridor is adjacent to the stream. Impacts from the roads, previous timber harvesting, mining, and grazing have contributed to the loss of instream woody material and to in-

creased bank instability. Poor drainage and maintenance of side roads and roads created by accessing dispersed sites are causing some localized impacts to the riparian zone and stream. Management impacts to the quantity and quality of water in streams tributary to Eagle Creek are largely undocumented, but they might be significant in a few areas (i.e. nutrient loading and sedimentation from poor bank conditions due to grazing).

Recent fish species observations on Eagle Creek have been spot checks conducted by the Forest Service and ODFW in portions of the mainstem and on various tributaries. Results indicate that planted and native rainbow are the primary species encountered. Brook trout, whitefish, and sculpins have also been observed in main Eagle. No bull trout have been observed recently, although none of the fish sampling to date has been adequate to state whether or not bull trout are still an important component of the Eagle Creek fish assemblage. Bull trout have been documented from recreational angling catches, although not in any significant numbers. Bulltrout populations are thought to have successfully coexisted with chinook and steelhead, utilizing the eggs and young as a food source (Meehan and Bjornn 1991). Streams, such as Eagle Creek, which no longer support anadromous fish and which have introduced brook trout populations, may no longer be able to support a healthy viable bulltrout population. Brook trout are a non-native species that interbreed with and may often displace native bulltrout, leading to the extirpation of the bulltrout (Leary 1991).

## WILDLIFE

### Populations

Many species of wildlife typical to the region inhabit the area including elk, mule deer, black bear, cougar, bobcat, beaver, coyote, fisher, marten, mink, muskrat, otter, raccoon, red fox, and other small mammals, reptiles, and amphibians. A large variety of birds can be found along Eagle Creek, including goshawks, golden eagles, osprey, pileated woodpeckers, great horned owls, blue and ruffed grouse, and many species of song birds.

Although suitable habitat exists for the federally-listed endangered American peregrine falcon (*Falco peregrinus anatum*) and threatened northern

bald eagle (*Haliaeetus leucocephalus*), and for candidate threatened and endangered species (Category 2) including the Preble's shrew (*Sorex preblei*) and Blue Mountain cryptochian (*Cryptochia neosa*), no threatened or endangered animal species are known to inhabit the Eagle Creek drainage. Peregrine falcon sightings have been reported in the drainage, and bald eagles have been sighted below the designated portion of Eagle Creek; however, no nests have been reported in the designated portion of Eagle Creek.

### Habitat

Wildlife habitat within the Eagle Creek drainage is varied, ranging from high elevation sub-alpine meadows and forests to low elevation ponderosa pine forests and grasslands. Except for small campsites and light grazing by recreational livestock, wildlife habitat is near pristine in the Wilderness portion of Eagle Creek. Suitable habitat exists for the endangered American peregrine falcon, threatened northern bald eagle, and candidate threatened and endangered Preble's shrew and Blue Mountain cryptochian; however, none of these species are known to inhabit the Eagle Creek drainage. The corridor provides high value elk summer range, and falls within the ODFW Keating elk management unit which supports approximately 500 head of Rocky Mountain elk. Portions of ten designated old-growth stands occur within the 1/4 mile interim boundary below the Wilderness boundary, providing suitable habitat for old growth dependent species and cavity nesters. While riparian habitat is near pristine in the Wilderness portion of the drainage, the lower Eagle Creek corridor has been somewhat altered by the construction of a gravel road, which reduced the extent of the riparian flood plain and narrowed and straightened the river course. The lower corridor includes portions of three livestock allotments, and the riparian conditions within the allotments are estimated to be fair to good.

## VEGETATION (NATURAL ECOSYSTEMS)

There is a wide variety of vegetation and plant communities found in the Eagle Creek corridor. This is due to the large elevational gradient between the headwaters and the lower boundary of the designated corridor, an elevation change of nearly 5,900 feet. A significant representation of the plant com-



munities of the Wallowa-Snake Province may be found in the corridor.

Eagle Creek begins at the outlet of Eagle Lake high in the Wallowa Mountains, and for the first 4.5 miles travels through the Eagle Cap Wilderness. Ecosystems are relatively undisturbed and natural processes dominate within this undeveloped river reach. At 7,448 feet, the lake is nearly at timberline, and is dominated by wet and dry meadows of sedge, rush, alpine grass, and heather. Stringers of whitebark pine and subalpine fir reach these elevations. As the stream progresses down the valley from the headwaters to the Wilderness boundary, the true subalpine forests of whitebark pine, subalpine fir, and heathers gradually change to high elevation forests of Englemann spruce, subalpine fir, and grouse huckleberry. Forests are interspersed with shrubs and brushfields in the unstable snow chutes, mountain mahogany and sagebrush communities on the drier south and east facing slopes of the drainage, and wet meadows in the valley bottom. Further downstream, mixed conifer forests of grand fir, Douglas-fir, and ponderosa pine become more dominant, and black cottonwood, quaking aspen, and alder grow in the riparian areas fringing the riparian meadow openings.

From the Wilderness boundary to the confluence of West Eagle Creek, is also a relatively undeveloped river reach. Grand fir, Douglas-fir, ponderosa pine, Englemann spruce, and western larch are the major tree species adjacent to Eagle Creek and on the moister, more favorable sites. The canyon slopes are typified by stringers of trees adjacent to rock outcrops and grassy openings on the drier sites. Ponderosa pine and Douglas-fir are the predominate tree species on southerly aspects. Moist and wet meadows fringed by deciduous trees are found adjacent to the creek. Disturbances to the riparian area are limited to dispersed campsites and spur roads along this stretch, and the road is located several hundred yards upslope and away from the river.

As the river continues to lose elevation as it progresses down the canyon, the mixed conifer forests become drier, and the open grassy slopes become more prevalent. Ponderosa pine, Douglas-fir, and western larch are the major tree species. Deciduous trees and riparian meadows are found along the creek bottom. The extent and condition of the riparian communities has been affected some-

what by the road that parallels the east bank of Eagle Creek. Continuing recreational use of the streamside meadows for camping, fishing, and picnicking also has some affect on the riparian communities.

There are ten stands of designated old growth forest that occur partially or wholly within the portion of the Eagle Creek corridor outside of the Eagle Cap Wilderness. Predominantly ponderosa pine stands, the overstory is often scattered and trees average over 40" in diameter. The open areas have a grass stand of predominantly bluebunch wheatgrass and pine grass. Associated tree species often include quaking aspen and black cottenwood along the creek.

A review of existing PETS plant records from Wallowa-Whitman National Forest files revealed four PETS plant sites within the Eagle Creek corridor. No official plant surveys have been done in the Eagle Creek Wild and Scenic River Corridor. The known sites were found by private individuals or Forest Service employees on their time off. The species with known sites are:

*Mimulus clivicola* (Bank monkey-flower). A population of this plant exists along the Martin-Bridge trail near Eagle Forks campground (Pine Ranger District). There were 36 plants observed at the site in 1992. The habitat for this species is open, dry slopes in the ponderosa pine forest type. There is a high probability that there are other populations of this species in the southern portion of the Eagle Creek corridor. This tiny annual plant with pink flowers is identifiable in June to July, depending on rain and the progression of the flowering season.

Bank monkey-flower is a Federal Candidate for listing, Category 2. This indicates that not enough information exists to decide one way or the other if it truly deserves federal listing. It is also on the Region Six sensitive plant list. This population represents the most southwesterly known location for the species. There are two other known small populations on Pine district, and about a dozen more in the Hell's Canyon National Recreation Area. It does not occur anywhere else in Oregon. The species is also found in central and northern Idaho.

*Pellaea bridgesii* (Bridge's cliff-brake). Three small populations of this species occur in the upper portion of the Eagle Creek corridor. There are 230 plants known there, and possibly more in the vicinity. They are all in the Eagle Cap wilderness and some plants are right near the main Eagle Creek Trail. This hardy fern is identifiable anytime the snow does not cover the waxy, blue-green leaves. It grows in boulder fields, and dry, rocky soils and slopes. There is a high probability that more populations of this species occur in rocky areas of the Eagle Creek corridor.

Bridge's cliff-brake is on the Region 6 Sensitive list. It has no federal status. There are two other known populations of this species in the Eagle Cap wilderness. It also occurs in the Fish Lake area of Pine District and at three sites on Baker District and one on Unity District. It is not found anywhere else in Oregon, but it is found in central Idaho and the Sierra Mountains of California.

Although no sensitive plant surveys have been conducted specific to the river corridor, there have been several surveys conducted in nearby areas. The Sensitive species found in these surveys are: *Allium brandegei*, *Botrychium lanceolatum*, *Botrychium pinnatum*, and *Ranunculus oresterus*. There is also a historical record for *Cryptogramma stelleri* somewhere around the Cornucopia area. All of these sites are outside the Eagle Creek Corridor or sphere of influence. However, it indicates that the probability for these species would be moderate to high for the Eagle Creek area.

The following PETS species habitats and their associated species from the 1992 Wallowa-Whitman sensitive plant species list may possibly occur in the project area. Aerial photos, topographic maps, Wallowa-Whitman Sensitive Plant Guide, and existing records were consulted to assess potential habitat in the project area. A species may be listed more than once if it is found in more than one habitat type.

#### *Forested Areas:*

*Allium campanulatum* (Sierra onion)  
*Botrychium* spp. (several grape fern species)  
*Carex concinna* (low northern sedge)  
*Cypripedium fasciculatum* (clustered lady slipper)

*Halimilobos perplexa* var. *perplexa* (puzzling halimolobos)  
*Lycopodium complanatum* (ground cedar)

#### *Rocky openings, scabs, cliffs* (moderate elevations):

*Allium brandegei* (Brandegee's onion)  
*Allium campanulatum* (Sierra onion)  
*Bolandra oregana* (Oregon bolandra)  
*Mimulus clivicola* (bank monkey-flower)  
*Oryzopsis hendersonii* (Henderson's rice grass)  
*Pellaea bridgesii* (Bridge's cliff-brake)  
*Phlox multiflora* (many-flowered phlox)  
*Primula cusickiana* (Cusick's primrose)  
*Ranunculus oresterus* (Blue Mountain buttercup)

#### *Rocky openings, cliffs* (High Elevations):

*Bupleurum americanum* (American thorough-wax)  
*Campanula scabrella* (rough harebell)  
*Cymopterus nivalis* (Hayden's cymopterus)  
*Geum rossi* var. *turbinatum* (Ross' avens)  
*Pellaea bridgesii* (Bridge's cliff-brake)  
*Saxifraga adscendens* var. *oregonensis* (wedge-leaf saxifrage)  
*Senecio dimorphophyllus* var. *paysonii* (Payson's groundsel)  
*Senecio porteri* (Porter's butterweed)

#### *Limstone Rock and Cliffs:*

*Asplenium viride* (green spleenwort)  
*Castilleja fraterna* (fraternal paintbrush)  
*Castilleja rubida* (purple alpine paintbrush)  
*Cheilanthes feei* (Fee's lip fern)  
*Cryptogramma stelleri* (steller's rock-brake)

#### *Sagebrush Steppe:*

*Allium brandegei* (Brandegee's onion)  
*Astragalus atratus* var. *owyheensis* (Owyhee milk vetch)

#### *High Elevation Riparian Areas:*

*Botrychium* spp. (several grape fern species)  
*Carex concinna* (low northern sedge)  
*Carex nova* (new sedge)  
*Kobresia myosuroides* (Bellard's kobresia)  
*Kobresia simpliciuscula* (simple kobresia)  
*Platanthera obtusata* (small northern bog orchid)

Salix farriae (Farr's willow)  
Saxifraga adscendens var. oregonensis  
(wedge-leaf saxifrage)  
Senecio dimorphophyllus var. paysonii (Pay-  
son's groundsel)  
Thalictrum alpinum var. hebetum (alpine  
meadowrue)  
Trollius laxus var. albiflorus (globeflower)

*Moderate Elevation Riparian Areas:*

Betula papyrifera var. commutata (Western  
paper birch)  
Botrychium spp. (several grape fern species)  
Calochortus longebarbatus (long-bearded  
sego lily)  
Carex concinna (low northern sedge)  
Dryopteris filix-mas (male fern)  
Phacelia minutissima (least phacelia)  
Trollius laxus var. albiflorus (globeflower)

Prior to any potential ground disturbing activities within the Wild and Scenic River corridor, surveys for threatened, endangered, or sensitive plant species will be conducted (FSM 2670.31).

## **SOCIO-ECONOMICS**

The Wild and Scenic River corridor flows through Baker and Union Counties and is about an hour drive from the county seats. The combined populations of the counties is approximately 39,000 people. Because the area has had only limited success in attracting diversified employment opportunities, the population has shown very little change for the last five decades.

The two counties are sparsely populated and rural in character encompassing 3,322,000 acres (7.6 people per square mile). Automobile travel times from the nearest metropolitan areas, Boise, Idaho, is approximately 3 hours by Interstate Highway. Mass transit includes bus and Amtrack rail service. In Union county, La Grande has a population of 11,766 and is the largest city. Baker City has a population of 9,140 people and is Baker County's largest city. Major employment comes from Federal, State, and local government, trade, tourism, lumber and wood products manufacturing, agriculture, and recreation service industries. Servicing the needs of the growing population of retirees is an emerging sector of the local economies. Per capita income is below the State average and unemployment rates are typically

above the State average. There is a marked ambivalence toward growth in the area. People want gainful employment for themselves and for their families, but are uncertain of the benefits of an increasing population.

Many people in the two-county area rely upon the wood products and agricultural industries for their livelihood. In 1993, this included about 3,000 people in 1993, or 15 percent of the total annual employment for the two counties. The reliance upon these two sectors of the local economy has its roots in the settlement of the area by Euro-Americans. Thus, reliance upon the wood products and agricultural industries has social as well as economic significance. This is rapidly changing however, as employment from tourism is beginning to replace that of wood products in some areas of the counties.

## **LAND USE CONTROLS**

There are a wide variety of local, State, and Federal programs that have either an indirect or direct effect upon land uses within the river corridor. The most significant programs, as well as those that have generated discussion during the scoping process, are discussed in this section.

**Union and Baker County Zoning.** Baker and Union Counties have a comprehensive land management plan covering all lands in the counties. The river corridor is zoned by both counties as timber/grazing. The policy of the counties is to maintain these lands for farm and forest use, and to actively discourage residential development and land partitions that result in parcels too small for economic farm and forest use. New structures on farm and forest land are allowed, as long as they are in conjunction with the existing use.

**Oregon Department of Fish and Wildlife.** The Oregon Department of Fish and Wildlife (ODFW) is charged with maintaining optimum numbers of indigenous fish and wildlife and to ensure that no species are threatened with extinction (They co-manage fish and coordinate wildlife management with the Nez Perce Tribe). The Department is also responsible for developing and administering fish and wildlife regulations. The ODFW has undertaken an aggressive program to restore riparian habitat on Department lands and has actively sought and encouraged other agencies and private landowners to

follow their lead. ODFW routinely monitors the Minam River angling effort and harvest, as well as hunter effort and harvest.

**Advisory Committee on Historic Preservation.** The Oregon Advisory Committee on Historic Preservation consists of nine members recognized professionally in the fields of history, architectural history, architecture, archaeology and/or other disciplines. One member represents the public at large and one represents Native Americans. The members are appointed by the Governor.

The Committee is charged with reviewing nominations to the National Register of Historic Places within Oregon and recommending approved nominations to the State Historic Preservation Office pursuant to the National Historic Preservation Act of 1966. The committee also reviews Statewide Plans for Historic Preservation.

**Oregon Department of Forestry.** The Department of Forestry, authorized by ORS 526.008 and established in 1911, is under the direction of the state forester, who is appointed by the Board of Forestry. The statutes direct the forester to act on all matters pertaining to forestry in the protection of forest lands and the conservation of forest resources.

These activities involve all phases of forestry, including responsibility for the protection from fire on private and State forests; the detection and control of harmful forest insect pests and forest tree diseases on state and private lands; the rehabilitation and management of state-owned forest lands; and operation of tree forest nurseries. The department also administers the Oregon Forest Practices Act, Log Patrol and Log Brand Acts, Small Tract Optional Tax Law, forest land classification, forestry assistance to Oregon's 25,000 non-industrial private woodland owners, and forest resource planning.

**Oregon Department of Environmental Quality.** Under a memorandum of understanding, the Oregon Department of Environmental Quality and Federal agencies work together to meet implementation requirements of the Clean Water Act (P.L. 92-500), as amended. The Federal Fish and Wildlife Coordination Act of 1958 requires wildlife conservation be given equal consideration and be coordinated with other features of water developments.

**Oregon Department of Agriculture.** The Oregon State Department of Agriculture cooperates with local soil and water conservation districts to establish mutual goals in coordinating range and watershed management practices and to gather and share natural resources information that has proven beneficial for use on public and private lands. Cooperation with appropriate weed control districts also occurs as needed to deal with infestations of noxious weeds.

**Oregon State Land Board.** The Division of State Lands is the administrative arm of the State Land Board (composed of the Governor, Secretary of State, and State Treasurer). Under constitutional and statutory guidelines, the Board is responsible for managing the assets of the Common School Fund as well as for administering the Oregon Removal-Fill Law. These assets include the beds and banks of Oregon's navigable waterways and are to be managed for the "greatest benefit for the people of this State, consistent with the conservation of this resource under sound techniques of land management."

The Division of State Lands also administers the State's removal-fill law, which protects Oregon's waterways from uncontrolled alteration. The law requires a permit for fill or removal of more than 50 cubic yards of material within the State's streams and rivers. The permit-review process involves coordination with the natural-resource and land-use agencies from the local through the Federal levels.

**Oregon Water Resources Department.** The Department administers State laws and policies relating to the diversion and appropriation of surface and ground water, establishes instream water rights for recreation, protection of fish and wildlife, to reduce pollution, and determines critical groundwater areas.

**Endangered Species Act.** The U.S. Fish and Wildlife Service and the National Marine Fisheries Service administer the Endangered Species Act of 1973 (as amended). Government agencies and private landowners may find their range of management strategies limited by the Act when it is determined that a threatened or endangered species, or its critical habitat, may be affected by a proposed management action.

**Pacific Northwest Electric Power Planning and Conservation Act.** The Bonneville Power Administration (BPA) through authorization by the Pacific Northwest Electric Power Planning and Conservation Act (P.L. 96-501), is involved in stabilization and

improvement of anadromous fish habitat, including riparian zones. The BPA accomplishes its conservation strategies through grants provided to a broad range of natural resource agencies.