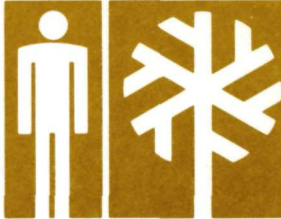


environmental assessment
development concept plan
amendment to the general management plan

CRATER LAKE



NATIONAL PARK / OREGON



United States Department of the Interior

NATIONAL PARK SERVICE

Pacific Northwest Region
Westin Building, Room 1920
2001 Sixth Avenue
Seattle, Washington 98121

IN REPLY REFER TO:

L7617(PNR-RE)

Greetings:

We are enclosing a copy of the Draft Development Concept Plan and Environmental Assessment for the Rim Village Area in Crater Lake National Park.

The purpose of this document is to discuss alternatives for providing lodging within the park, improving the camping experience, and implementing actions for the improvement of interpretive programs and enhancement of the Rim Village Area environment. The final document will serve as an amendment to the existing Crater Lake National Park General Management Plan (December 1977).

We have scheduled public meetings to review the alternatives presented in the document. The meetings will be held at the following times and places:

1. Klamath Falls, Oregon--March 20, 1984, 7:30 p.m., City Council Chambers (lower level of the City Administration Building), 500 Klamath Avenue
2. Medford, Oregon--March 21, 1984, 7:30 p.m., City Hall, Municipal Court Room (second floor), 411 West Eighth Street
3. Roseburg, Oregon--March 22, 1984, 7:30 p.m., Umpqua Community College, Science Building, Room 10
4. Salem, Oregon--March 23, 1984, 7:30 p.m., Transportation Building, Conference Room 122 (East Summer and Center Streets, entrance off of Capitol Street)

Comments on the Development Concept Plan and Environmental Assessment may be submitted until April 23. A public response sheet has been included as part of this document for your convenience. Additional copies of the response sheet and/or document are available upon request from the Regional Director, Pacific Northwest Region, National Park Service, Westin Building, Room 1920, 2001 Sixth Avenue, Seattle, Washington 98121 or the Superintendent, Crater Lake National Park, P.O. Box 7, Crater Lake, Oregon, 97604. Comments should be sent to the Seattle address.

Thank you for your interest and assistance.

Sincerely,

Daniel J. Tobin, Jr.
Regional Director

Crater Lake National Park

United States Department of the Interior / National Park Service

Environmental Assessment Development Concept Plan Amendment to the General Management Plan

For further information contact:

Superintendent
Crater Lake National Park
Crater Lake, Oregon 97604
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SUMMARY

The General Management Plan for Crater Lake National Park, approved in 1977, did not resolve the issue of lodging in the park when the existing lodge had outlived its useful life. The NPS directorate has determined that the old lodge cannot be restored for lodging in a cost-effective and safe manner. Ultimately its use as a hotel must be discontinued. The need for and location of lodging within the park is a significant issue requiring an amendment to the General Management Plan (GMP).

Under the NPS planning process, general management plans may either be revised or amended. A revision is essentially a new plan dealing with a variety of issues that need to be addressed together. An amendment deals essentially with a single issue (in this case, the location of lodging within the park) that can be addressed without requiring a revision of those parts of the GMP dealing with other issues. Because the current GMP left the lodging issue unresolved, several statements in the GMP are subject to varied interpretation, and some components of the alternatives presented in this assessment could be interpreted as being in violation of the intent of the GMP. This assessment refines management objectives and presents alternative approaches to achieve these objectives. Upon approval, the Development Concept Plan and the management objectives stated therein will be incorporated as an amendment to the GMP.

This Environmental Assessment addresses alternatives and their environmental consequences for providing lodging within the park, improving the camping experience, and implementing actions for the improvement of interpretive programs and enhancement of the Rim Village area environment. Possibilities for adaptive use of Crater Lake Lodge for purposes other than a major hotel are explored as a separate, but parallel, issue.

Alternative A would remove major development from the rim area, placing all services and facilities at a lower elevation. The road to the rim would not be kept open in the winter. Alternative B is a variation on A, in which interpretive facilities would be in the Rim Village area and winter access would be maintained. Alternative C (preferred) would split lodging between lower elevation sites and the Rim Village area and would provide interpretive facilities in the Rim Village area. The three alternatives encompass a wide range of separate possible actions evaluated by the planning team. The alternatives present three philosophical concepts for park development: no major facilities on the rim; interpretive facilities on the rim; retention of traditional facilities and services on the rim.

The three alternatives assume that year-round lodging could be provided if economically and operationally feasible. All provide for a major rehabilitation of the Rim Village area, with the removal of roads and parking from the edge of the caldera. Two of the alternatives would retain road access to the Rim Village area in the winter.

All alternatives would enhance the visual quality of the Rim Village area and reduce the potential for lake contamination by connecting facilities to

a sewer system, eliminating the need for blowing snow over the rim when clearing Rim Village roads and parking areas, and reducing pollutants from vehicles by reducing Rim Village roads and developing a central parking area.

The proposed development would occur on disturbed and undisturbed sites, with the most significant localized environmental impact occurring on undisturbed sites. Currently undisturbed areas would be affected primarily with the construction of a sewage lagoon (alternatives A & B), placement of cabins (all alternatives), and the development of a new access road to the Rim Village area (alternative C). The most significant development-related impact is expected to be the loss of some mature trees. Careful siting of facilities would minimize this impact. The design of cabin and campground facilities as walk-in, rather than drive-in, would be a mitigating measure intended to reduce vegetation loss.

The net long-term increase in acreage used for development would be minimal because of the restoration of a large portion of the Rim Village area to more natural conditions. Most of the increase in developed acreage is attributable to the provision of a sewage lagoon for development in the lower Munson Valley under alternatives A and B.

Alternative C, the preferred alternative, would reduce the acreage dedicated to permanent development within the park, while retaining traditional services and facilities in the Rim Village area. Alternative C has the highest development and continuing operational costs but would cause the least impact on currently undeveloped land within the park.

Following a preliminary analysis of alternatives for adaptive use of Crater Lake Lodge, it is recognized that the proposed actions would probably lead to the ultimate demolition of the structure. The final decision on the future of the structure will be made following further analysis of alternatives for funding restoration and adaptive use and consultations in accordance with the requirements of the National Historic Preservation Act of 1966 (as amended).

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Purpose of and Need for Action

The General Management Plan for Crater Lake National Park, approved in 1977, contains a number of proposals for improvement of the park environment and visitor services. These proposals have been reevaluated, and the concepts remain valid. However, the GMP left the question of lodging open for resolution at such time as the existing lodge had outlived its useful life.

Extensive studies (see Bibliography) have indicated that the existing lodge cannot be renovated for public lodging in a cost-effective manner. Costs to provide structural stability and bring guest rooms up to modest contemporary size have escalated to nearly \$8.6 million in 1984. The number of rooms would have to be reduced from 80 to approximately 56. In addition, the stability of the caldera in the lodge area is questionable. Although a catastrophic failure cannot be predicted, continued movement will require annual (and sometimes extensive) maintenance. Extensive improvements have been made to increase visitor safety, but ultimately, its use as a hotel must be discontinued. A separate but parallel study summarized in this document (see appendix A) is evaluating other potential uses for the lodge structure.

It is recognized that the development of alternative lodging facilities could very likely lead to a decision to demolish the lodge; however, it must be emphasized that this decision has not been made. The National Park Service intends to pursue a thorough review of alternative uses and funding sources for the lodge before making a determination as to whether the lodge has reached the end of its useful life.

A comprehensive plan for lodging and other improvements is needed so that essential visitor services can be maintained and improved. The alternatives presented were derived from a study of over 40 possible actions that were carefully evaluated and reduced to basic components. It would be possible to arrange the components in a wide range of alternatives. However, the alternatives, as presented, represent all of the components required to achieve management objectives, and it would be feasible to develop a plan by combining compatible components from different alternatives. The objectives for a development concept plan for Crater Lake National Park are stated below.

OBJECTIVES

To provide a quality, year-round interpretive program
To provide a quality lodging/camping experience
To reduce visual intrusions/congestion in the Rim Village area
To reduce environmental impacts in the Rim Village area that could affect the Crater Lake ecosystem

To Obtain These Objectives, Planning is Based on the Following Assumptions:

An adequate facility is needed within the park to provide audiovisual program, exhibit, and information services for summer and winter visitors.

A safe way to view the lake in the winter is essential.

Access to the Rim Village area in the winter cannot be guaranteed at all times.

Overnight lodging in the park is a desirable visitor experience; year-round lodging should be provided if feasible.

Some variety in accommodations and price range should be provided.

The existing lodge cannot be renovated to provide continued lodging in a cost-effective manner; alternative uses for the lodge structure and the possibility of its demolition will be explored.

Parking/roads will be removed from the Rim Village area to the extent feasible.

Any new construction carried out in the park under this development plan will follow design guidelines based on the rustic architectural theme already established in the park. These guidelines will address the basic principles of the rustic style -- the use of native materials, complementary color schemes, scales and siting that harmonize with the natural environment -- and significant features of the style's historical application in the park.

When approved, this Development Concept Plan will provide guidance for the orderly progression of improvements within the park and will constitute an amendment to the General Management Plan. Desired actions contained in the approved General Management Plan have been delayed while the lodging issue remains unresolved. Although the emphasis in the proposals is on lodging facilities, the major result will be a significant improvement in the visitor experience in the Rim Village area and the reduction of some existing conditions that may have an effect on Crater Lake. While there is a probability of adverse impacts on historic resources, the positive effects on the natural environment and aesthetic improvements in the Rim Village area are considered of primary importance.

Affected Environment

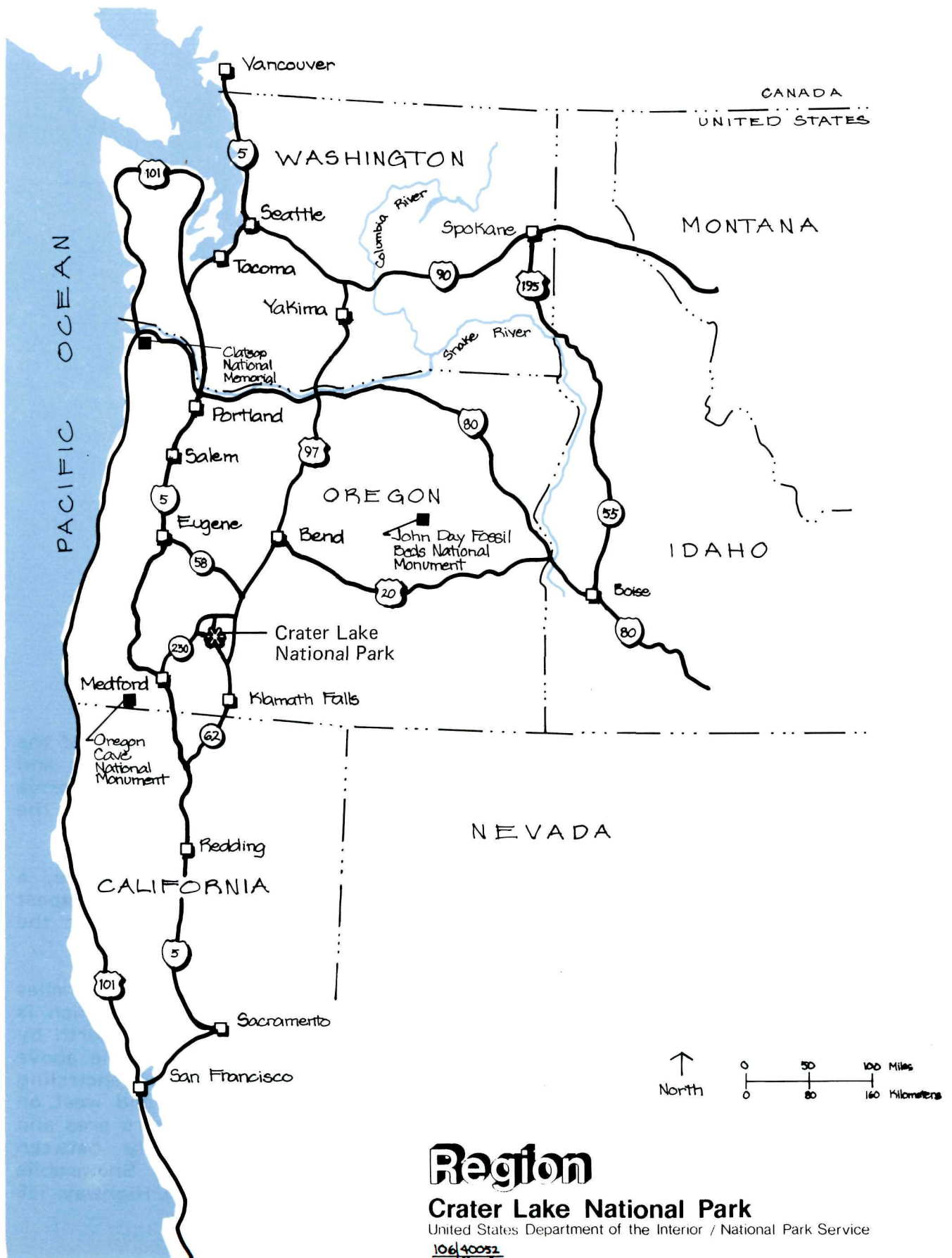
EXISTING CONDITIONS

Park Location and Access

Crater Lake National Park is in southwest Oregon at the south end of the Cascade Range. It lies in an area with a long history of volcanic and glacial activity extending from Lassen Peak in northern California northward into Canada. Crater Lake occupies the collapsed caldera of the once majestic Mount Mazama.

Crater Lake is 4.5 to 6.0 miles across, has 20 miles of shoreline, a surface area of 21.5 miles, and with a depth of 1,932 feet at its deepest point, is the deepest lake in the United States. It is known for the clarity of its waters and the intense blue color.

The park entrance at Annie Spring is 76 miles from Medford and 56 miles from Klamath Falls and can be reached by Oregon Highway 62, which is kept open year-round. The park can also be reached from the north by Oregon Highway 138. Park roads lead from intersections with the above highways into the park where they meet the 33-mile Rim Drive encircling the lake. Winter access is maintained only from the south and west on Oregon Highway 62 and through the Munson Valley headquarters area and up to the Rim Village area. Road closures, particularly between headquarters and the rim, are common during the winter. Snowmobile use is permitted on the north entrance road between Oregon Highway 138 and the junction with the Rim Drive.



Visitor Use

The main visitor use season at the park occurs during July and August, but winter use, particularly on weekends, is increasing due to the popularity of cross-country skiing, snowmobiling, and general snowplay. The extreme snow depths are the major factor limiting nonrecreation-oriented visitors during the winter. It is not uncommon for some park facilities to remain inaccessible into June, and major snowstorms have closed the park road temporarily soon after Labor Day. In 1981 there were 536,719 visitors to the park, with 75 percent of this visitation occurring between Memorial Day and Labor Day. Visitation was down in 1982 and 1983 because of exceptionally heavy snowstorms. The attraction of Mt. Saint Helens also tended to reduce visitation to national park areas in the Pacific Northwest. Studies (available at park headquarters) have indicated that 85 percent of the visitors remain in the park less than eight hours and 65 percent less than four hours. Seventy-five percent of this visitation occurs during the five-hour period between 10:00 am and 3:00 pm and is concentrated in the Rim Village area. Based on averages, over 3,800 people pass through the Rim Village facilities each day during the summer.

Summer visitors to the Rim Village area spend their time shopping and eating at the concessioner facility, strolling the walks along the rim of the caldera to view the lake, and viewing the limited exhibits in the Rim Visitor Center. A smaller percentage walk down to the Sinnott Memorial to view the exhibits and listen to talks by naturalists. Some visitors participate in the guided walks and other interpretive programs. A slide or movie program is presented each evening in the community building.

Winter use has been averaging 10,000 visitors per month, with most use occurring on weekends. Cross-country skiing has been increasing in popularity (a 116 percent increase from 1979 to 1981), and it is not uncommon to have 500 to 700 skiers on a good weekend. Others come to enjoy the beauty of the park and see the lake. Families or friends of skiers who are not skiing may spend a good portion of the day in the cafeteria building.

A winter use study conducted in 1980 by the National Park Service reaffirmed the desirability of maintaining winter access to the Rim Village area, and providing the opportunity for such limited winter recreational activities as cross-country skiing, snowshoeing, and restricted snowmobiling. While winter lodging in the park did not appear to be in great demand, it was concluded that the demand would grow and that some winter lodging should be provided if economically and operationally feasible.

Visitor Services and Facilities

Crater Lake National Park provides a range of visitor services and facilities appealing to various users. A majority of the visitors come to the park to see the lake, may stop at some of the pullouts along park roads, and may participate in interpretive programs offered primarily in the Rim Village area. Two auto campgrounds provide 210 sites. Mazama

Campground (198 sites) has modern, cold-water comfort stations and an amphitheater for evening programs. This campground is currently operated by the park concessioner. Major complaints are the lack of hot water and showers. Other development at Annie Creek consists of an entrance station and a seasonal residence for NPS personnel.

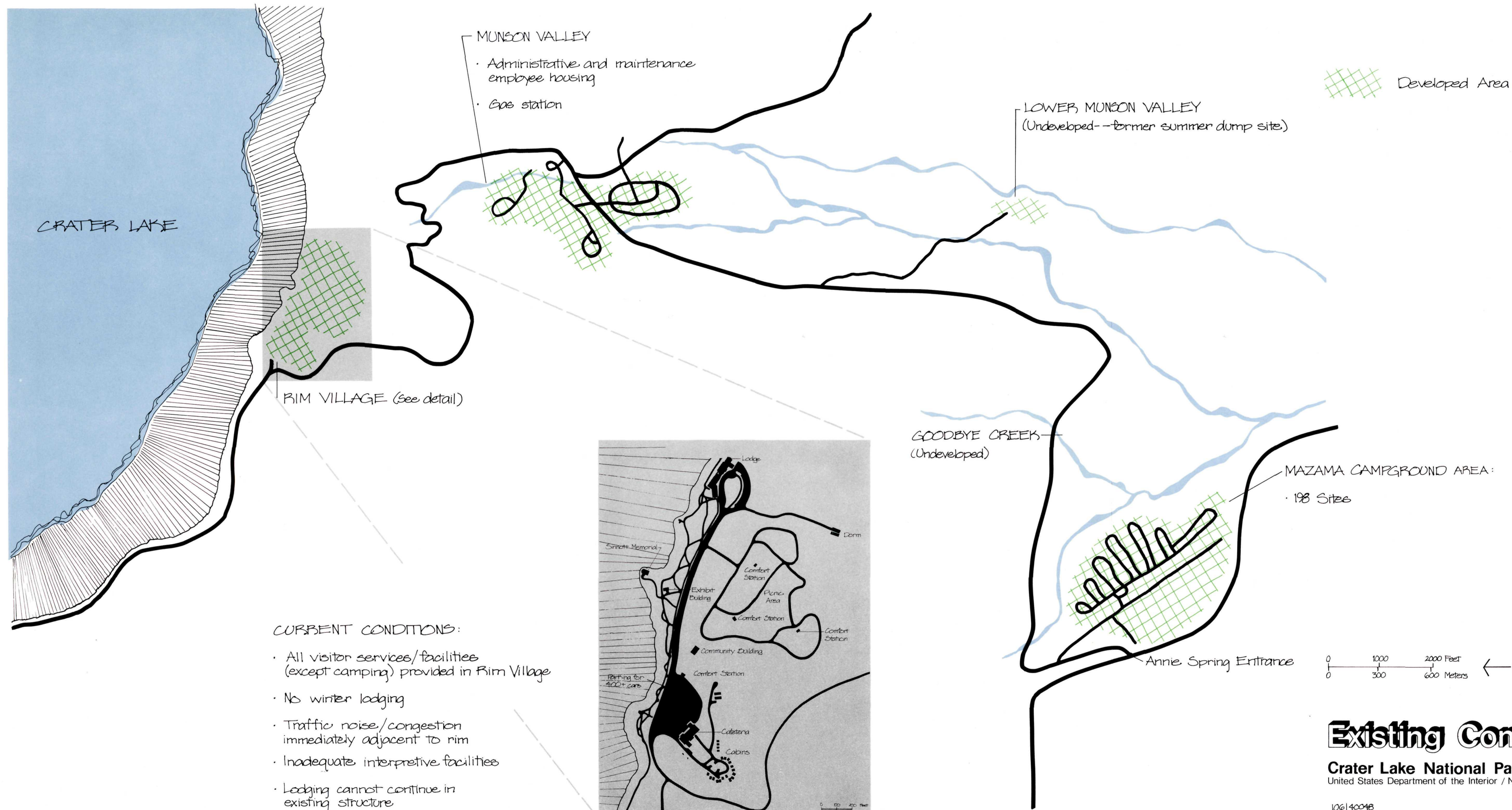
Most of the facilities in the Rim Village area and Munson Valley, developed between 1910 and 1940, are old and outmoded. A wing of the cafeteria building is the only relatively new visitor use facility along the rim.

The Rim Village area is a complex of isolated structures connected by a network of roads, extensive parking areas, and walkways. Although the area was originally developed in the 1930s as a pleasant rim promenade from which to view the lake, increasing visitation led to periodic expansion of parking and facilities; now pedestrians along the rim are constantly aware of the traffic movement and must cross busy traffic lanes and parking areas to reach many of the lake viewpoints and facilities. The approved General Management Plan calls for restoration of the Rim Village area to a more natural, pedestrian environment, with the relocation of parking and removal of roads. The GMP also recognizes the need for an interpretive focal point in the park and a safe means to view the lake in the winter. Although the beauty of the lake and many natural features are best conveyed onsite, the forces shaping this natural wonder and the biotic/ geologic associations may best be interpreted through various media in a structured setting.

The concessioner, Canteen Company of Oregon, operates 20 cold-water cabins behind the cafeteria building and the 80-room Crater Lake Lodge. Lodging is available for approximately 90 days during the summer season. The lodge contains many substandard rooms and has major structural defects (reports on file at park headquarters, Western Regional Office, and Denver Service Center). Many safety problems have been corrected, but structural failure during the winter remains a possibility unless extensive renovations are undertaken. Movement of the structure because of an unstable site and heavy snowload requires annual repairs. The concessioner also operates the cafeteria/curio shop in Rim Village on a year-round basis, runs a summer season gas station in Munson Valley, and provides bus tours around the Rim Drive and boat tours on the lake.

In the Rim Village, NPS facilities are extremely limited. An old community building, now referred to as the Rim Center, serves as an auditorium during the summer. While the Rim Center does provide a place for interpretive programs, the facilities are minimal and the location does not attract heavy use. The structure does not have enough exits, so it is considered inadequate for public use. The Rim Center was severely damaged by heavy snows during the 1982-83 winter and is currently unsafe for winter use. This required moving the ski-touring concession to the Rim Visitor Center.

The exhibit building, a small structure on the rim now referred to as the Rim Visitor Center, is in an obscure location and visitation is low. This is the main contact point between NPS personnel and park visitors (other than at the entrance stations). The building contains a small information



Existing Conditions

Crater Lake National Park
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desk, sales area, and minimal exhibits. In the winter, the building serves as a ski-touring facility (operated by a subconcession). This concessioner rents ski and snowshoe equipment and provides lessons and guide services. The nearby Sinnott Memorial, a small structure below the rim, offers a spectacular view of the lake. Talks on the formation of the lake are given on a regular schedule, and a small exhibit room emphasizes the geological processes that created the lake. Access is difficult because of the steep path and stairs, and the memorial is only open during the summer.

Viewing the lake in the winter can be hazardous because of huge piles of snow along the rim as a result of plowing operations. Weather conditions, particularly wind, diminish viewing safety. Currently, a road culvert is placed on supports at the edge of the rim to form a tunnel through the snow bank. This provides an unattractive, though somewhat protected, means to view the lake; however, the heavy snows of the past two winters completely covered the view end of the tunnel.

The lodge and employee dormitory are connected to a wastewater treatment system in Munson Valley. Other facilities are connected to a septic tank/leachfield system behind and west of the cafeteria. Because of the potential for pollutants to enter the lake, all facilities in the Rim Village area are scheduled to be connected to the Munson Valley wastewater treatment system.

NPS-operated visitor facilities in Munson Valley are limited to a small (six-seat) room for viewing films and slides and an information desk at park headquarters. An adjacent building, a former ranger dormitory, is scheduled for remodeling to provide offices and curatorial space for the park staff. Information functions will be moved to that facility, a somewhat larger audiovisual program space will be provided, and there will be a small exhibit area. Additional parking will be provided. These facilities will still be inadequate to serve summer visitors but will be an improvement over existing facilities in the headquarters building and will provide a better place for winter visitors to learn more about the park resources when the road to the rim is closed.

Additional visitor facilities and services are provided elsewhere in the park, but these do not directly relate to the issues being addressed in this Development Concept Plan. Two areas being considered for development currently have no facilities. The Goodbye Creek area is undeveloped except for some underground utility lines running close to the park road. Lower Munson Valley has no facilities other than a narrow service road to a former summer dump site and a buried electric power line.

NATURAL ENVIRONMENT

Geology

Detailed information on the Crater Lake geology is found in the 1977 General Management Plan.

The present form of the Crater Lake area is the result of a violent volcanic history, intermixed with glacial advances and retreats. The study areas demonstrate a temporal sequence of volcanic and glacial activity.

Barring a reactivation of volcanic processes, there are few geologic hazards within Crater Lake National Park. The area is seismically active, but tremors and microquakes are detectable only by delicate instruments.

The primary hazard occurs from a gradual erosion of the caldera wall, which varies considerably with the composition of the rim. Erosion is quite evident in portions of the Rim Village where soft surface materials overlay a tilted, unstable rock layer while other areas are stable and show little effect from erosion. This is quite visible where very old trees exist a few feet from major slides. In some areas, portions of the rim have receded severely, requiring relocation of walls and walkways. The rim in front of the lodge is gradually receding. Retaining walls supporting the lodge terrace are tilting outward, but it is unknown whether this is caused by the erosion of the caldera wall, continual heavy snow loads, freeze-thaw action, or other forces. Inclinometers were installed in 1981 to evaluate the stability of the rim in the lodge area (1983 letter from FHA). Readings did not indicate any significant movement, suggesting a potential for catastrophic failure but did indicate that continued movement will add to maintenance problems. Facilities developed back from the rim have not been affected by ground movement, indicating that these areas are relatively stable. However, the structures have suffered damage because of eccentric and/or excessive snow loads. Based on the underlying structure of the caldera wall in most of the Rim Village area, major structures should not be developed close to the edge.

Topography/Soils

The localized topography of the study sites is relatively flat with slopes of less than 10 percent, except in the cafeteria area which has been modified through the years to create level parking terraces and building sites. The elevations range from approximately 6,200 feet at the lower Munson Valley and Mazama Campground to 7,100 feet at the Rim Village area.

The soils in the areas developed on the surfaces of Mazama pumice, alluvium, and glacial debris. In general, the soils are considered regosols with poorly defined soil horizons. Most, if not all, of the soils are "excessively drained" with permeability of 6.0 to 20.0 inches/hour (USDI 1977). The major influences that determine vegetation types are elevation within the park, the inability of the soil to hold water, and precipitation, but not the soil type.

A site-specific soil analysis will be conducted to determine constraints and precautions to be followed for any proposed development.

Climate/Air Quality

Crater Lake National Park is near the midpoint of the Sierra Cascade Mountain province of the Pacific mountain system. The park lies within the influence of the Pacific Ocean weather and the majority of storm fronts that pass the north Pacific Coast each winter.

The summer weather is generally mild with clear skies except for occasional thunderstorms, which seldom occur with enough force or volume to produce damaging rains or hail. Daytime summer high temperatures usually range from 60°F (15.6°C) to 70°F (21°C) and seldom exceed 85°F (29.4° C).

Approximately 70 percent of the annual precipitation falls from November through March, with less than 6 percent from June through August. During the dry months--June, July, and August--an average of only five days will have precipitation greater than 0.10 inch. Traces of snow have fallen during all of the summer months. Annual snowfalls can total over 600 inches, and long-lasting snow depths of 100 to 200 inches accumulate. This accumulation of snow places tremendous vertical and lateral loads on all structures. Snow loads on structures in Munson Valley have been calculated at up to 500 pounds per square foot. Snow loads are only slightly less in the vicinity of Annie Spring and slightly greater in the rim area, although the difference in snow depth between these areas can vary considerably. Wind patterns in the Rim Village area cause snow to collect by drifting against buildings, causing unbalanced eccentric loads. The four-story lodge and three-story employee dormitory have, at times, been completely covered with snow.

Crater Lake National Park has been designated a class I area under the Clean Air Act, as amended in 1977. This classification allows the least incremental increase for sulfur dioxide and particulate matter above ambient levels. The Clean Air Act also states that visibility and other air quality-related values within the park shall be protected (USDI 1983).

Vegetation

The flora of Crater Lake National Park is typical of the vegetation found throughout the southern High Cascades. Generally, the vegetation of the region reflects a mosaic of forested areas and open nonforested areas. Climate, topography, soil development, and fire history all affect the composition and distribution of existing plant communities.

The study sites are all considered mountain hemlock forest communities, but the species composition does differ at each proposed development site. The vegetation in the Rim Village and Munson Valley is primarily composed of mountain hemlock; the Annie Spring and Goodbye Creek areas are vegetated primarily with lodgepole pine and Shasta red fir. Mountain hemlock forests are characteristic of the upper elevations (5,500 to over 8,000 feet) of the park. Mountain hemlock generally occurs in open parklike meadows. The sparse understory consists principally of wood-rush. At upper elevations, mountain hemlock tends to grow in isolated stands or clusters. Also associated with mountain hemlock,

beginning at approximately 6,200 feet outside the project areas and occurring in the same parklike manner, is whitebark pine. The open meadow areas are composed of a variety of grasses, and along stream courses sedges and willows predominate.

Two candidate endangered and threatened species, the pumice (Oregon) grapefern, Botrychium pumicola, and Mount Mazama collomia, Collomia mazama, are located in Crater Lake National Park (Federal Register December 15, 1980). Neither plant has been reported to occur in the proposed project areas. The grapefern has been reported to occur along the flanks of Cloudcap (more than 8 miles from the project sites) and on Llao Rock (on the opposite side of the lake). Collomia has been recorded from west side creek drainages (USDI, Crater Lake NP, park records 1983). A botanical survey will be conducted of the affected areas before construction.

Wildlife/Fisheries

The most frequently seen animals in the park are small mammals such as squirrels, chipmunks, pikas, marmot, and hares. Deer, black bear, pine marten, porcupine, and red fox are also seen with some regularity. The most frequently observed birds include Clark's nutcracker, the gray jay, and Stellar's jay. The valley garter snake is the only species of snake that occurs naturally in the park and is generally, but uncommonly, found along watercourses and bogs within the park.

The American peregrine falcon (Falco peregrinus anatum) is the only species on the federal endangered wildlife species list (Federal Register, May 20, 1980) which occurs in the park. There are nesting sites within the park, but none have been recorded in the project areas (park files). Bald eagles (Haliaeetus leucocephalus) may occasionally be seen flying over the area, but no active nesting sites have been reported.

Self perpetuating populations of fish are known to occur in ten streams within the park. Exotic rainbow trout, brown trout, and kokanee occur within Crater Lake as a result of stocking prior to 1939.

Water Resources

The drainage patterns commonly found on youthful geologic terrains are absent in the park. Even on steep slopes, the runoff channels are broad and poorly defined with the rounded contours of a mature drainage system. This is because the surface runoff in the park from rain and melting snow is negligible. Water sinks almost immediately into the porous volcanic soils and glacial debris and is released only slowly through evaporation, plant use, seeps, and a few springs, some of which emerge within the caldera and flow directly into the lake. Permanent stream beds in the park generally have steep-sided channels (USDI 1977) and stream banks are considered wetlands. No floodplains are affected by the alternatives.

Four drainage creeks are within the project area. Munson and Goodbye creeks merge with Annie Creek, which flows into the Klamath River system. Dutton Creek, originating near the Rim Village, flows westward into the Rogue River system.

Crater Lake is immediately to the north of the project area and is the prime resource of the park. The lake is considered youthful with extremely dilute water. The clarity and light penetration contribute to the deep blue color that is the key to the visitor attraction. Recent studies (NPS) indicate a 25 percent reduction in clarity of the lake between 1969 and 1979. An intensive limnological study was initiated in 1981 to determine the cause of this decline. Data collected in 1983 indicates that spring water entering the lake from below the Rim Village area contains nutrients (primarily nitrates) which could affect clarity of the water. A source of these nutrients has yet to be determined, but the leachfield in the Rim Village area is suspect.

The domestic water supply for the existing development in the area is from Annie Spring. The water supply currently appears adequate for the demand at existing and proposed facilities.

CULTURAL RESOURCES

Crater Lake National Park has no known significant cultural resources other than those associated with park development and management. Although the region has a colorful history, the park areas were little used by native Americans or settlers in the area, primarily because of the long-lasting snow coverage. Hunting, gathering timber harvest, and grazing occurred in the past, but there were no known permanent settlements until the park facilities were developed.

An archeological overview of the park was completed by Oregon State University in 1963. No significant archeological sites were found within the park, but the limited nature of the overview does not preclude that significant sites may be located. A survey of park structures and sites was conducted in compliance with Executive Order 11593 to determine if any sites qualify for nomination to the National Register of Historic Places. Only Crater Lake Lodge has been listed on the National Register. A number of other park structures have been recorded on the List of Classified Structures (all structures over 50 years old) and are being evaluated for National Register eligibility. In addition to the lodge, the exhibit building in the Rim Village area is the only structure on the list that may be directly affected by the proposed actions. Other structures on the LCS may be indirectly affected by nearby actions.

No ground disturbance action will be undertaken until site-specific surveys have been undertaken and each project has received archeological clearance. These surveys will be undertaken following preliminary design to more precisely determine the location of proposed facilities. In the event that any archeological, paleontological, or historic resources are disclosed during the implementation of any action within the park, the action will be halted pending professional examination and assessment in accordance with the requirements of the National Historic Preservation Act

of 1966 (as amended), "Regulations for Protection of Historic and Cultural Properties" (36 CFR 800), NPS "Management Policies" (chapter 5), and NPS 28, "Cultural Resources Management Guidelines." Similarly, the above requirements will be followed prior to the implementation of any action that would affect known cultural resources on the National Register or the List of Classified Structures.

SOCIOECONOMIC ENVIRONMENT

Crater Lake National Park is a vital element in a diverse regional recreation complex. Many visitors stop at the park as part of a north-south trip to various parks and scenic areas in Oregon and northern California. The region offers many summer and winter attractions, including cultural events, boating and rafting, hiking, hunting, and skiing. Regional visitors tend to visit other areas for specific activities but include Crater Lake, if only briefly, in their itinerary. Less than 15 percent of the park visitors remain overnight, and less than five percent stay two or more nights. It is unknown what percentage of park visitors obtain lodging or campsites outside the park and may return to the park on a day-use basis. Summer use of the park trails is sporadic, with most use occurring along the Pacific Crest Trail. Backcountry users in the winter and day-use winter sports enthusiasts are increasing.

Lodging and related services are available close to the park in the summer, but many of these facilities have sporadic winter operations. Diamond Lake Resort (44 miles from the Annie Spring entrance station) is a major year-round operation with potential for increased winter use because the development of a nearby downhill ski area currently in the planning stages. Union Creek Resort (19 miles to the west) and facilities in Fort Klamath (15 miles to the south) have minimal winter use. Snow conditions are marginal in these two areas, and winter guests are generally enroute to either Crater Lake or winter use areas in the Umpqua National Forest.

The advent of winter lodging inside the park could have two very differing effects on private operators near the park: It could be harmful to private operators by taking away their customers, or it could stimulate demand for the private operators because of a more active winter atmosphere. Of particular importance is the NPS commitment to maintain access to the rim area in the winter. Another factor would be the cost of winter lodging in the park. If these costs are towards the high range, it could stimulate demand for lower-priced accommodations adjacent to the park. The general conclusion is that private operators adjacent to the park (with the exception of Diamond Lake Resort) would do little to provide winter accommodations as long as the park is operated on a day-use basis. However, they would expect to benefit from the promotional activities of the concessioner and the general awareness that the park is an overnight destination in the winter (Market Study, NPS, report on file at park headquarters). This effect is evident in the summer, with local businesses primarily receiving the "overflow" when the park facilities are filled to capacity.

Preliminary analysis indicates that year-round lodging in the park would be profitable for a concessioner with the NPS maintaining access to the rim. However, during the first few years of operation the concessioner and the subconcessioner (Crater Lake Ski Service) would need to aggressively promote the winter operations (Market Study, 1983 supplement, NPS, report on file at regional office). Regional economy would be affected through increased revenues from sales, taxes, and employment.

Alternatives

In assembling the alternatives, a number of additional sites were considered for lodging development. The areas presented in the following alternatives are the sites found to be most suitable for development after consideration of location, size, accessibility, proximity to existing utilities, site features, topography, vegetation, snow removal, and other operational and environmental concerns.

The alternatives present concepts for development within the park and are considered feasible on the basis of preliminary studies. It is recognized that the proposals will be refined during the design phase. In particular, the number of lodging units at a particular location may change because of site constraints, construction costs, or other economic or environmental factors. Options are provided for some proposals, providing the designers some latitude to determine the most cost-effective and environmentally sound means to achieve the objective. Actions comprising each alternative are summarized in the following table; preliminary cost estimates are included in appendix B. A number of proposed actions are common to all except the No Action alternative and are listed below.

SUMMARY OF ALTERNATIVES

<u>OBJECTIVES/ACTIONS</u>	<u>NO ACTION</u>	<u>ALTERNATIVE A</u>	<u>ALTERNATIVE B</u>	<u>ALTERNATIVE C (Preferred)</u>
<u>OBJECTIVE: To provide a quality year-round interpretive program</u>				
Interpretive Center	Permitted in Rim Village under approved GMP	Construct either new structure (±5000 sq. ft.) or addition to existing structure (±3000 sq. ft.) in Munson Valley	Convert cafeteria in Rim Village to interpretive center/ski-touring/snack bar facility with upper level lake viewing area (±17,000 sq. ft.)	Construct interpretive facilities in Rim Village lodge/cafe/tertia complex, with shared common spaces and upper level viewing space (±4000 sq. ft.)
Sinnott Memorial	Retain	Retain	Retain	Retain
Exhibit Building (Rim Visitor Center)	No action proposed	Retain - visitor contact point	Remove	Adaptive use or remove
Community Building (Rim Center)	No action proposed	Remove	Remove	Remove
<u>OBJECTIVE: To provide a quality lodging/camping experience</u>				
Cold-water Cabins	To be removed - no planned replacement	Construct 20-36 budget cabins and central restroom adjacent to Mazama campground; provide central parking.	Same as A	Same as A
Lodging	Existing lodge to be closed upon completion of present contract or when required for visitor safety - no planned replacement	Construct a year-round 60-room lodge/30 cabins in lower Munson Valley with dining, gift shop, bar, cafeteria operation; improve access road and provide wastewater treatment system	Same as A	Construct 58-room lodge addition to cafeteria in Rim Village--±30 rooms for winter use, dining room, and indoor parking for 40 vehicles; construct 32 medium-priced cabins (some with kitchens) and office/lounge/employee quarters at Goodbye Creek, some winter use potential, central parking, and walk-in cabins.
Concession Employee Housing/Admin./Maintenance Facilities	Dormitory/offices would remain at Rim Village for useful life	Remove from Rim Village; construct replacement facility in Lower Munson Valley	Same as A	Facility could remain for useful life with eventual replacement in Munson Valley and Annie Creek; some employees to be housed in lodge in winter; management facilities could be incorporated into new lodge at higher cost
Camper Services Facility	Permitted at campground entrance under approved GMP	Construct store, snack bar, laundry, shower, gas service across from Mazama campground	Same as A	Same as A
Gas Station	Retain in Munson Valley	Relocate to camper services	Same as A	Same as A
Mazama Campground Expansion	Permitted under approved GMP	Develop when needed--±50 walk-in sites and comfort station	Same as A	Same as A
Group Camping	No change proposed	Develop at former Annie Spring campground area; rehab or replace existing comfort station--site, road, parking rehab (long term)	Same as A	Same as A

OBJECTIVE: To reduce visual intrusion and congestion in Rim Village

Roads/Parking/Structures	Removal and replacement elsewhere permitted under approved GMP	Retain ±80 parking spaces near Sinnott Memorial; retain comfort station and exhibit building; all other roads, parking areas, and structures to be removed; restore vegetation and develop walkways and trails	Develop ±320 car/20RV/bus parking area behind remodeled cafeteria; access from present road junction; remove all other roads, parking areas, and structures (except Sinnott Memorial); restore vegetation and develop walkways and trails	Develop parking as in B plus new access road and overflow parking if needed; retain service access to dormitory and old lodge as long as required; remove all other roads, parking, and excess structures; exhibit building may remain for adaptive use if lodge is not retained; restore vegetation and develop walkways and trails
Picnic Area (Rim Village)	Remove excess roads and comfort stations as permitted under approved GMP	Remove roads and comfort stations--provide some picnic tables	Remove roads and comfort stations--retain as walk-in picnic area	Remove excess roads and all comfort stations; utilize part of existing road for access to dorm and old lodge; retain as walk-in picnic area
Utility Systems	Connect cafeteria and comfort station to Munson Valley sewage treatment system to eliminate environmental hazards in rim area; provide utility extensions for campground expansion (long range)	Provide utility extensions for budget cabins, campground expansion, and camper services; extend water, telephone to lower Munson Valley and construct onsite sewage treatment system; connect Rim Village comfort station to Munson Valley sewage treatment system.	Same as A except connect remodeled cafeteria building to Munson Valley sewage treatment system (rim comfort station to be removed)	Connect lodge/cafeteria/interpretive center to Munson Valley sewage system, upgrade other rim area utilities if required; provide utility extensions for budget cabins, campground expansion, and camper services; extend water, power, and telephone into Goodbye Creek site; construct sewer main to connect Goodbye Creek site to Mazama campground treatment system; group camp same as A.

OBJECTIVE: To reduce environmental impacts in the Rim Village area that could affect the Crater Lake ecosystem

The proposed actions are the same under all alternatives, with minor variations:

Reduce vehicle emissions and contaminants through the reduction or elimination of roads and parking areas adjacent to the rim and the reduction of vehicle movement through the use of a central parking area remote from the rim

Eliminate drainage from roads and parking areas into the caldera

Eliminate blowing of snow, which may contain contaminants, over the edge of the rim

Connect all facilities to a sewer system with treatment in Munson Valley, eliminating the existing septic system serving some of the facilities

Where development is removed from the Rim Village area, implement a program of intensive revegetation utilizing native plant species

ADAPTIVE USE OF CRATER LAKE LODGE

The renovation and adaptive use of Crater Lake Lodge, should such action prove feasible, could be implemented under any of the alternatives; an access road and some parking would be required if the structure is retained. Should it not prove feasible to retain the lodge, it would be removed and the site restored to near natural conditions.

NO ACTION ALTERNATIVE

Under the no action alternative, there would be no overall plan for lodging within the park. Actions approved in the General Management Plan (see preceding table) could be implemented and would meet the stated objectives for improved interpretive services and removal of roads and parking from the Rim Village area. Under the no action alternative, the lodge would be closed when the concession contract terminated or sooner if visitor safety could not be maintained. A no action approach would only delay necessary decisions regarding future lodging in the park and is, therefore, not a viable alternative.

ACTIONS COMMON TO ALL ALTERNATIVES

Annie Spring/Mazama Campground Area

A camper services facility would be provided near the Annie Spring/Mazama Campground area in a clearing south of the campground entrance road. The facility would contain a general store, snack service, shower and laundry facilities, and a gas station. It is recommended that the location of the facility described in the GMP be changed to reduce congestion at the campground entrance.

The Munson Valley gas station would be removed and incorporated in the camper services facility near the Mazama Campground.

Budget cabins would be developed by the concessioner next to the campground and camper services facility. These cabins would replace the cold-water cabins in the Rim Village area. A total of 36 cabins could be developed; only 20 are planned in the initial phase. The development would be served by a central restroom facility and central parking developed adjacent to the existing road. Access to the cabins would be by pathways from the parking areas. Winter use of these cabins is not proposed.

Several options were considered for a group campsite but only one was considered viable. The abandoned Annie Spring Campground would offer a site close to the main campground and related services but would be sufficiently removed to avoid possible conflicts and undue congestion. Access, parking, and sites would need rehabilitation. The existing comfort station would need renovation or replacement. The comfort station would be connected to the Mazama Campground wastewater treatment system.

The approved General Management Plan permits expansion of the Mazama Campground as the need arises. Up to 50 additional sites would be designed as walk-in tent sites with central parking developed adjacent to the existing road. A comfort station would be connected to the existing sewer system.

Utilities close to the proposed development sites in the Annie Spring/Mazama Campground area would require minimal extensions and upgrading to serve the new facilities.



Alternative Development Sites

Crater Lake National Park
United States Department of the Interior / National Park Service

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DEC 1960 E9

Rim Village Area

The Sinnott Memorial would remain for summer interpretive programs. No feasible and cost-effective means were found to provide winter access to the memorial.

All alternatives would require the removal of most or all parking and roads from the rim in the Rim Village area. This would significantly change winter operations. Snow would no longer be removed from in front of the cafeteria building, requiring a change in winter access to the rim area. Snowplows would no longer blow snow towards the lake, eliminating the "snow berm" that makes access to view the lake from the Rim Village area difficult and hazardous. Winter visitors would, under alternatives B and C, be able to view the lake from an enclosed viewing area on an upper level of the interpretive center. Access to the caldera edge might be difficult for those not willing to try snowshoes or skis. Some winter use areas roll out snow fencing to form an oversnow walkway, which could be tried at Crater Lake. Generally, the rim area would become a more natural, although not untrammelled, setting for winter and summer visitors.

With removal of most or all parking and roads adjacent to the rim in the village area, the rim could be restored to a pedestrian environment, enhancing the leisurely, pedestrian promenade concept established in the 1930s. Depending on the alternative, some walkways would be realigned, seating and group gathering spaces would be established, stone walls would be repaired, and native vegetation restored. Careful attention to detail would be essential to ensure that the character of the original design is retained while permitting movement of the growing numbers of visitors. The current design with linear parking has led to extensive vegetation trampling between parking areas and the rim. With a central parking area and a walkway system radiating from central facilities, it is hoped that the excessive short-cutting and resultant vegetation loss could be substantially reduced, if not eliminated.

ALTERNATIVE A

This alternative would minimize development on the rim and concentrate services in the Annie Spring, lower Munson Valley, and Munson Valley areas.

Rim Village Area

The Sinnott Memorial, which contains a small exhibit room, Rim Visitor Center, and comfort station would remain. The comfort station would be connected to the Munson Valley wastewater treatment system. Parking would be reduced to a small area near the Rim Visitor Center. All other facilities would be removed. The road would not be plowed beyond park headquarters in the winter; access to the rim would be provided (for a fee) by concessioner-operated oversnow vehicles.

Munson Valley

A reception/interpretive center would be developed in Munson Valley. Two options are available: to construct a new facility near the site of the gas station, or to expand the ranger dormitory to provide additional program/exhibit space. Both options would be explored during the design stage. The gas station site would be used for additional parking.

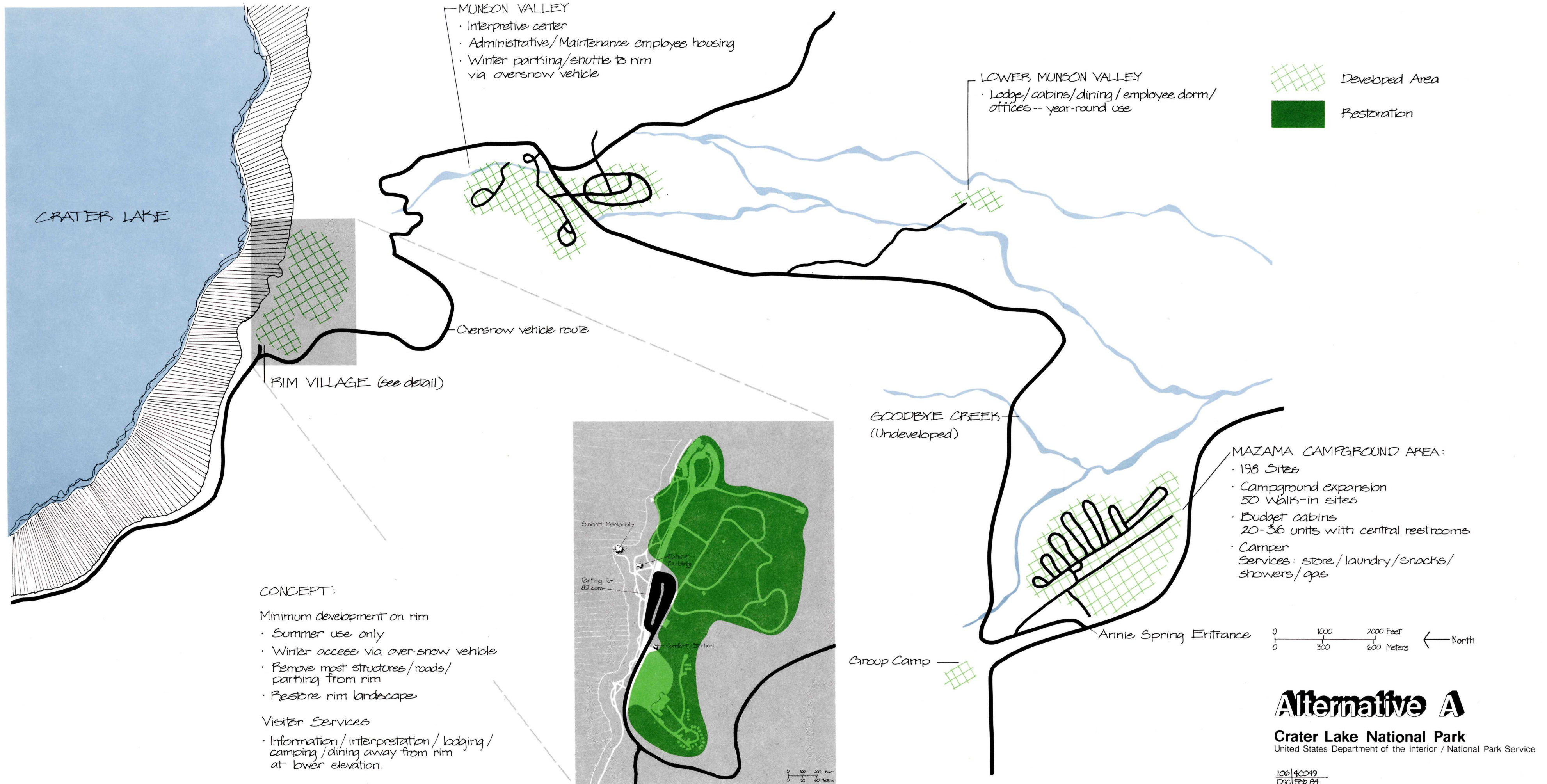
Lower Munson Valley

The major concession facility would be developed in this area. Approximately 90 lodging units (60 rooms and 30 cabins), a lounge, dining facilities, gift shop, cafeteria or coffee shop, and other facilities would be developed. Concession offices, employee quarters, and related management facilities would be on this site but separate from the public use facilities. The structures and grounds would be designed as a significant architectural statement compatible with the rustic style of the existing park structures. A winter ski-touring facility would be included, and a portion of the lodge would be designed for year-round operation. Transportation to the rim area would be available by concessioner tour buses in the summer and oversnow vehicles in the winter.

Water and telephone lines are adjacent to the park road and would be extended $\pm 3/4$ mile into the site. The primary park power line passes through the site. Sewage would be treated onsite in a lagoon system. The existing access road and bridge would require upgrading for two-lane traffic and snow removal. The major development, including parking, would occur in a large clearing formerly used as a summer dump site.

Annie Spring Area

Camper services, budget cabins, a group campground, and campground expansion would be developed in this area as described under "Actions Common to All Alternatives."



ALTERNATIVE B

This alternative, essentially the same as alternative A, would significantly reduce development and congestion in the Rim Village area, while retaining year-round use.

Rim Village

The existing cafeteria building would be acquired from the concessioner and remodeled as an NPS interpretive center with exhibits, ±100-seat audiovisual room, lounge/warming room, winter lake viewing room (upper level), restrooms, and a ski-touring/snowshoe concession. Beverages and simple snacks (possibly with vending machines) would be available in the interpretive center. All other structures except the Sinnott Memorial would be removed. All roads and parking in the rim area would be removed, and a new parking area for approximately 300 cars and 20 RVs/buses would be constructed behind the cafeteria. The building would be connected to the Munson Valley wastewater treatment system.

Munson Valley

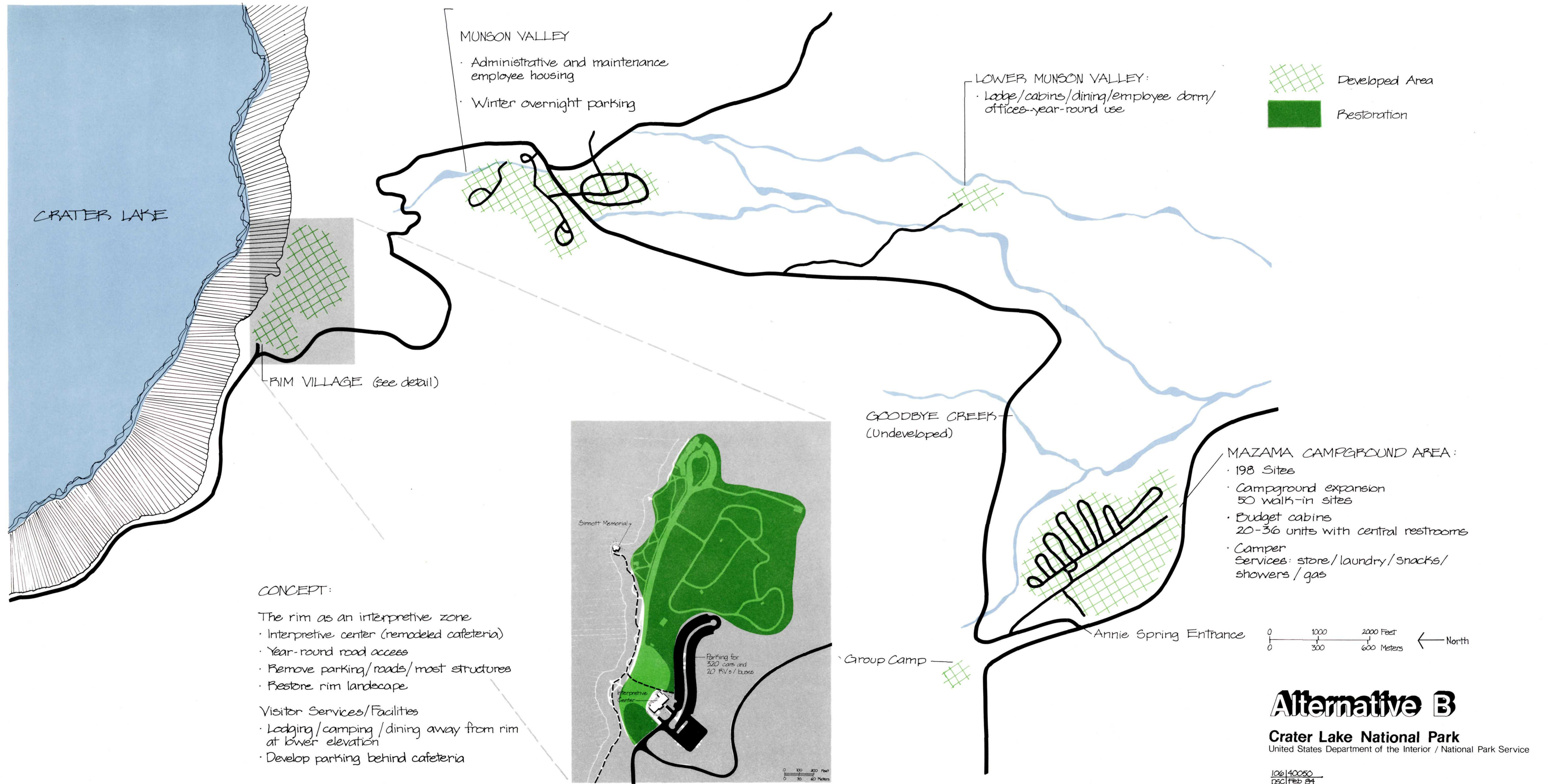
The small interpretive facility in the remodeled ranger dormitory would serve primarily as an information facility in the summer. In the winter, it would serve as the primary visitor facility when the road to the rim is closed because of weather conditions. Additional parking would be provided at the present gas station site.

Lower Munson Valley

The development of a major lodge complex, other concessioner services, and concessioner housing would be the same as alternative A.

Annie Spring Area

Camper services, budget cabins, a group campground, and campground expansion would be developed in this area as described under "Actions Common to All Alternatives."



ALTERNATIVE C (PREFERRED)

This alternative would retain traditional uses/activities in the Rim Village area and reduce congestion and the total developed area within the park.

Rim Village Area

The existing cafeteria building would be expanded with the addition of approximately 58 lodge rooms, dining facilities, and public spaces including an interpretive center. The latter would include exhibit spaces, a 100-seat audiovisual room, and an upper-level lake viewing area. The lodge would be designed to permit 25 to 30 rooms to be used in the winter. Winter ski-touring services would be provided in the cafeteria building. The term "expanded" is used with caution. The intent is to create an attractive complex in the rustic-style park architecture, set back from the rim and entered from the present back side. There should be a clear distinction between the concession day-use functions, lodging, and interpretive functions. Covered parking for ± 40 cars and essential management vehicles would be provided at the lower-level parking area of the new structure. Because of prevailing winds, the design of the structure, parking area, and parking garage entrance would require careful study with wind tunnel tests to ensure that the project does not create additional snow removal problems. Additional covered parking would be provided if shown to be economically feasible during the design phase. As a minimum, indoor parking for overnight guests would be considered essential to reduce snow removal problems in the winter.

Parking for approximately 300 cars and 20 RVs/buses would be developed behind the lodge/cafeteria complex, and additional parking (100 to 150 vehicles) would be provided at a lower level adjacent to the main road if the main parking area proved to be inadequate. A new access road would be constructed to provide a more attractive approach to the development, reduce snow removal problems, and improve traffic circulation. As described under alternative B, existing roads and parking would be removed from the rim area, but a service road to the employee dormitory and old lodge would be maintained through the picnic area as long as these facilities remained.

The exhibit building (once known as the Kaiser Studio) was constructed in 1921 and served as the headquarters for the nationally known artist whose handcolored photographs of Crater Lake and other views of the Northwest were once in great demand. There is some interest in establishing an artist-in-residence program. Should the lodge not be retained, consideration would be given to using this structure for such a program. Other possible uses would be a gathering point for interpretive programs or simply a shelter during the inclement weather. If an appropriate use could be found, the structure would be retained. Otherwise, following proper evaluation for historic significance and consultation procedures, it would be removed.

The employee dormitory/offices would ultimately be removed and new facilities developed in Munson Valley. Concessioner management offices

could be included in the new dormitory or added to the camper services facility at Annie Spring. Additional studies are required to determine if it would be economically feasible to move the existing dormitory to Munson Valley. Until such time as a new dormitory could be provided in Munson Valley, winter use of the existing dormitory might be feasible with over-snow access. Summer access would be by a service road through the picnic area.

If the new lodge was operated in the winter, employee housing for six to eight persons would be provided in the lodge/cafeteria complex to ensure that there is adequate staff to provide for guest safety and comfort during periods when the park road might be closed during the winter. Closures of up to three days have not been uncommon. Additional park personnel and equipment could reduce the time the road is closed, but this would add significantly to annual operations cost.

The lodge/cafeteria complex would be connected to the Munson Valley wastewater treatment system. Currently the Munson Valley system is not used to full capacity, but further analysis and consultation with the state would be required to determine if the existing system is adequate to handle the additional loads. Water, power, and telephone lines are at the site, but capacities might be inadequate to serve the expanded functions in this location.

Munson Valley

Visitor facilities and services (a small information/exhibit center and parking) would be the same as alternative B. Ultimately, concessioner housing would be developed in an employee housing area in Munson Valley.

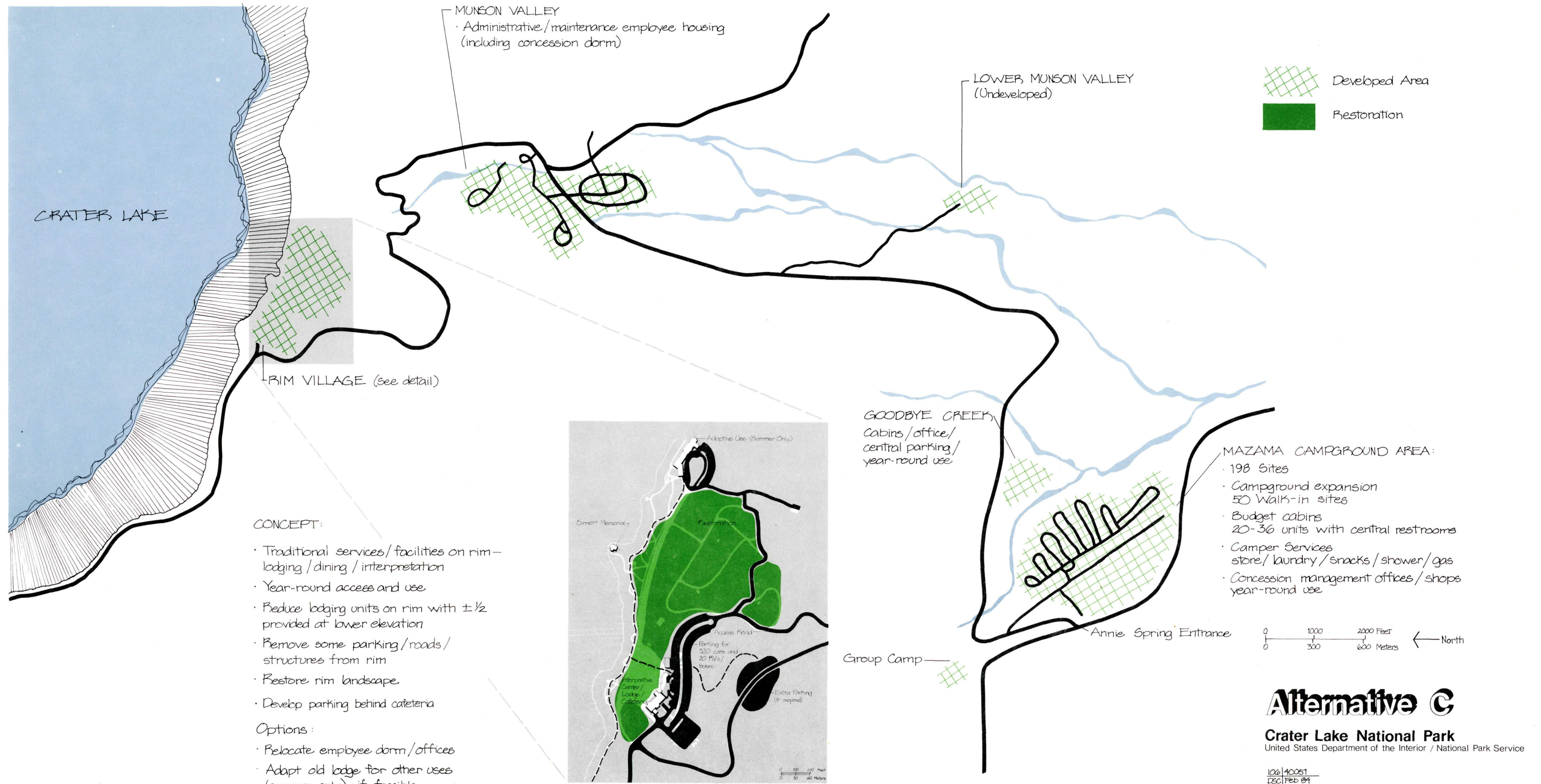
Goodbye Creek

Approximate 32 housekeeping cabins and a central office/lounge would be developed at this site. Cabins would be a mixture of one-and two-story structures and clustered in groups of four to eight units. Visitors would walk into the cabins from a central parking area. An evening program area would be provided, possibly on a terrace adjacent to the office/lounge. A trail system would be designed to link with the Annie Creek trail and Mazama Campground. Second story cabin units could be used in the winter. A winter ski-touring concession could operate from this facility, providing lodging and transportation services. Quarters for a manager would be provided, and quarters for two to three additional employees might also be provided, particularly for winter operations.

Water, power, and telephone lines are adjacent to this site. A sewer line connecting this site to the Mazama Campground wastewater treatment system would be required, although onsite treatment alternatives would be studied. The latter does not appear feasible because of the small available acreage, soil conditions, and proximity to streams.

Annie Spring Area

Budget cabins, campground expansion, and a camper services facility would be developed as described under "Actions Common to All Alternatives." Concession management facilities might be developed in conjunction with the camper services facility if not provided in the new lodge or in Munson Valley.



Environmental Consequences

NATURAL RESOURCE IMPACTS

Quantities used in this assessment are based on programmatic requirements and will be further refined during preliminary design. In most instances, a maximum figure has been used for impacts from specific construction projects and a range from minimum to maximum for affected areas. Design criteria will call for minimal impact construction techniques (such as pumping concrete into a site rather than driving a mixer into the site), and it is anticipated that the area disturbed can be reduced from these estimates.

The net change in land devoted to structures, roads, and parking facilities varies with each alternative. The change is calculated by subtracting areas where facilities are to be removed from the undeveloped areas where facilities are to be added. Figures are approximate and subject to change during the design phase.

Alternative A: ± 9 acres net increase in developed area

Alternative B: ± 7 acres net increase in developed area

Alternative C: ± 2 acres net decrease in developed area

Impacts of No Action Alternative

This alternative proposes no changes to the approved General Management Plan (USDI 1977). Removal and restoration of most of the rim roadway and parking areas and the "Actions Common to All Alternatives" (except budget cabins) which were approved in the 1977 GMP would result in the same environmental impacts as those described in the following section. The most significant aspect of this alternative concerns the question of lodging within the park, which would be deferred until a later date. This alternative is considered infeasible because it would delay the implementation of necessary improvements.

Impacts of Actions Common to All Alternatives

Annie Spring/Mazama Campground Area. Establishing a camper services facility in a previously disturbed clearing south of the campground entrance road would affect a 1- to 2-acre area. The precise area of impact would depend on the design of the facilities. Construction of this facility would disturb up to 1.0 acre of previously undisturbed area (within the 2 acres), primarily for access road widening. This site is generally an open area, but several mature trees would be removed for construction. Approximately 0.7 acre would be graded and leveled for construction of the structures and, of this total, a 0.5-acre area would be covered and removed from biological productivity. The wildlife in this area would be displaced. The remaining disturbed acreage would be landscaped and revegetated with native plant species (species list for each area available at the park). It should take 20 to 100 years for the revegetated area to resemble a truly natural state.

The construction activities would result in the surface disturbance of the soils and soil compaction on the site. Air quality would decrease slightly, but temporarily, because of soil surface disturbances and construction equipment emissions. Increased noise and visitor inconvenience would also occur during the period of construction, which would be during the peak visitor season. Following the covering of the surface, a local increase in surface runoff is expected, but because of the porosity of the soils, very limited soil erosion problems are expected.

The Munson Valley gas station would be included in the camper services facility outlined above. This action would remove the visual intrusion of the contemporary gas station from the rustic headquarters complex. The proposed location is well removed from streams and would reduce the possibility of stream contamination as is possible at the present location.

The proposed budget cabins in the Mazama Campground vicinity would be placed in a 10- to 12-acre area. The actual area of vegetation removal, soil disturbance, and surface covering would be 0.5 to 1 acre. Selective tree removal would be done on this site for installation of the cabins, and the total vegetation removal area followed by surface covering would comprise approximately 0.5 to 1 acre including parking. The actual design layout and the extent of required construction vehicle access would determine the number of mature trees that would be removed.

These cabins would be a walk-in facility, which would result in the avoidance of developing an extensive access road system. Maintenance/service access would be by small utility vehicles capable of using pathways. Winter use and access are not proposed. Trails and walkway locations would be developed from the parking area to the cabins and from the cabin area to the camper services facility. The utility system would also be installed beneath some of the trail system whenever possible. The sewer main is already in place through the site. The trenching activity for installation of the utility system would affect up to a 15-foot-wide path of vegetation along approximately 500 linear feet of utility lines. The use of the entire trail system would result in denuding a 5- to 8-foot-wide pathway of vegetation, trampling of vegetation adjacent to the trail, and compacting the soils along the pathway. Visitor use of the cabin area would result in trampling of vegetation on and adjacent to the sites. Localized impacts on vegetation would increase tree mortality and require removal of hazard trees, with a net reduction in tree stand density and limited successful plant reproduction. Intensive maintenance and revegetation would help mitigate these impacts. Most of the wildlife species not adaptable to human activities would be displaced from the 10- to 12-acres area.

The proposed group campsite in the abandoned Annie Spring Campground is a previously disturbed area. The formerly used access routes, parking area, and campsite(s) would be used to provide this function. The reestablishment of this area for limited camping would require the removal of several lodgepole seedlings and rehabilitation or replacement of the existing comfort station. Because of the proximity of the potable water source, the comfort station would be connected to the existing sewer system. The use of a camping facility in this area could threaten the potable water supply of the park because of soil nutrient increases from the scattering of materials, such as campfire ashes, excess food, and soap (Cole and Fichtler 1983). The potential for impact on park water sources would be further evaluated before implementation of this action. Careful site selection and regulation of use could mitigate adverse impacts.

The proposed expansion of the Mazama Campground would increase campsites by up to 50 walk-in tent sites. The 12- to 15-acre area designated for this expansion would require some selective tree removal and minor leveling of tent pad sites. Approximately 1.0 to 1.5 acres would be affected by the clearing and leveling of campsites, use of a trail system, construction of a comfort station, and provision of a parking area adjacent to the existing road. This area would be denuded of vegetation and removed from biological productivity. Use of the campground area would trample vegetation adjacent to each site, compact soils within the used camping area, and displace most wildlife from the area. Localized impacts on vegetation would increase tree mortality, reduce successful plant reproduction, and require removal of hazard trees with a net reduction in tree stand density.

The development of a camper services facility and budget cabins and expansion of camping facilities would increase vehicle movement in the area, adding to localized air pollution. Most of the traffic increase would occur at arrival and departure times. Additional traffic would be

generated by management vehicles and delivery trucks going to the camper services facility and some traffic to the gas station. Little local traffic movement would be expected because most visitors could walk to the camper services facility. With supplies available within walking distance, there would be some reduction in travel to the Rim Village area for necessary supplies. Relocation of the gas station would not generate additional traffic by visitors but would increase the distance traveled by employees to obtain fuel. These actions would be expected to have a relatively minor effect on localized air quality. The primary effect would occur when vehicles were lined up, with motors running, waiting to obtain a space in the campground. Management is studying procedures to reduce these traffic jams.

Rim Village Area. Maintaining the Sinnott Memorial would have no additional environmental impact. Removing the community building would eliminate the only facility currently available for indoor interpretive programs, but these facilities are to be provided elsewhere. Removal of comfort stations and excess roads in the picnic area (a former campground) would permit an extensive forested area to return to more natural conditions. Some picnic facilities would be retained as a walk-in facility with paths, tables, and grills. These actions would allow 6 to 8 acres to return to natural biotic productivity. The precise acreage would vary, depending on the extent of roads to be retained under the various alternatives.

The removal of most or all of the 450 parking spaces and up to 2,100 linear feet of two-lane roads from the rim area would allow the restoration of approximately 6.0 acres of disturbed open mountain hemlock forest. The precise acreage to be restored would vary in each alternative, but a significant quantity of roadways would be removed in each, providing slight additional protection of the lake from vehicular-related pollutants (e.g., petroleum products and emissions). The elimination of these areas for vehicular travel would also eliminate the need for snow plowing and the blowing of snow over the rim under alternatives B and C. The designated areas to be removed would be scarified, recontoured, landscaped, and revegetated with native plants (species lists for revegetation are available through the park resource staff).

With removal of extensive parking and elimination of constant vehicle movement, the rim area of the village would be returned to an attractive pedestrian environment. Depending on the alternative, there would be some realignment of walkways, restoration of stone walls, establishment of seating and group gathering areas, and restoration of native vegetation; in effect re-creating the leisurely pedestrian promenade established in the 1930s.

None of the proposed alternatives would affect endangered or threatened species in the area. Also, no wetlands would be adversely affected by any proposal (letter to U.S. Fish and Wildlife Service for concurrence submitted Jan. 12, 1984).

All proposed facilities would be connected to existing wastewater treatment systems or, in the case of development in the lower Munson Valley, to a new lagoon system. The lagoon treatment method has proven the most

successful method, considering soil and weather conditions at Crater Lake. Connecting all facilities in the Rim Village area to the Munson Valley treatment system would permit the existing septic/leachfield system at the rim to be abandoned. While it is not known if this system has had any effect on water quality in the lake, it would be desirable to discontinue its use.

Impacts of Alternative A

Munson Valley. The proposed reception/interpretive center to be developed in Munson Valley would affect 0.1 acre of partially disturbed area. Removal of several trees would be required for this construction, and the covered area would be removed from biological productivity. The conversion of the existing gas station to a parking area would provide the required additional parking space. This construction activity would result in a slight, but temporary, decrease in air quality because of dust and vehicular emissions. A temporary increase in noise and visitor inconvenience would result during the construction period. Development of a major visitor facility in Munson Valley would increase localized vehicular and pedestrian traffic in the area, possibly adding to safety and security problems.

The use of oversnow vehicles would result in increased noise, an increase in odor, and a decrease in the aesthetic qualities of the area during the operation of these vehicles. However, these impacts would occur at intermittent intervals and would generally be less offensive than snowplowing operations and regular vehicle traffic to the rim.

Lower Munson Valley. The proposed central concession facility in the lower Munson Valley would affect approximately 12 acres, of which approximately 4 acres is a previously disturbed open area within a lodgepole pine mountain hemlock ecotone. A 4-acre sewage lagoon, included in the total acreage, would be constructed to provide wastewater treatment onsite. Providing for these functions and establishing adequate access would completely impact approximately 8 acres. This area would be covered or surfaced and removed from biological productivity. Also, an additional 1 to 4 acres would be partially impacted because of selective tree removal in the area proposed for the location of cabins. Use of these areas would also result in slight to moderate trampling of vegetation on and adjacent to the sites. All established trails would be denuded of vegetation and soils would be slightly compacted. Wildlife not adaptable to human activities would be displaced from the 12 acres of totally or partially impacted area.

The construction activities would moderately, but temporarily, decrease air quality because of dust and construction equipment emissions. Some visitor inconvenience would be expected during the construction because of equipment travel along park roads. Following construction, approximately 2 acres would be landscaped and revegetated with native plants.

The access road to lower Munson Valley would require some widening and straightening for safer vehicle access and snow removal and would also

require the widening or replacement of a bridge at the current crossing at Munson Creek. The bridge construction would temporarily increase silt and sediment to the creek; however, the surrounding soils would stabilize rapidly following construction.

With the major visitor facilities removed from the Rim Village area, visitors would tend to spend less time in the area than under current conditions, permitting a considerable reduction in parking. Eighty parking spaces and approximately 750 linear feet of two-lane road would remain, reducing capacity by 80 percent. Congestion could be expected in this area on peak visitation days if visitors tended to remain longer than projected. A longer stay could be encouraged if the park provided interpretive programs (such as nature walks). The removal of the entire parking area should be done incrementally to avoid the removal of required parking spaces. Although the conditions of the area would be modified significantly, it might be determined that more than 80 parking spaces would be required.

Impacts of Alternative B

The environmental consequences of the proposed development in the lower Munson Valley are outlined in alternative A and also apply to this alternative.

The proposed remodeling and adaptive use of the existing cafeteria building in the Rim Village area would have minimal environmental effects but would result in short-term visitor inconvenience during remodeling. Constructing a parking area behind the structure (in an area now occupied by cabins and service roads) would affect from 2 to 3 acres of previously impacted mountain hemlock forest. Several mature mountain hemlock might be removed for the proposed parking area, and the site would be surfaced and removed from biological productivity. Water runoff would increase slightly from the surfaced area, but this would only slightly increase local erosion because of the characteristics of the soil. All drainage would be away from the lake. The construction activity would moderately, but temporarily, increase dust, particulate matter, and emissions in the air. Dust and particulate matter from the construction might reach Crater Lake. Frequent sprinkling of the construction site should minimize this potential.

All rim roads and parking areas and most existing structures (6.0 to 8.0 acres) would be removed, scarified, landscaped, and revegetated as described under "Actions Common to All Alternatives."

The impact of the Annie Spring/Mazama Campground proposals are outlined under the "Actions Common to All Alternatives."

Impacts of Alternative C (Preferred)

The proposed addition to the cafeteria building in the Rim Village area is one of the main variations in this alternative. The proposed addition would retain approximately 50 percent of the lodging accommodations in

the area and would continue to concentrate visitor use in the area of the Rim Village. The lodging addition to the cafeteria would cover approximately a 0.3-acre area of fill material previously placed to create a parking area for the cafeteria. In direct relationship to adding a lodging facility, the access road, circulation, and parking would be relocated to improve visitors' orientation and the aesthetics of the site. Construction of the access road and the parking area behind the proposed lodge would affect an additional 2 to 3 acres within mountain hemlock habitat. The majority of this area has been previously impacted because of the cabin placement, fill for parking areas, and access roads. An additional 2 acres of relatively undisturbed areas would also be affected to provide lower-level parking and an access road from the main road to Rim Village. Approximately 20 to 30 mature mountain hemlock might be removed to develop the parking area and access road. The exact number of mature trees to be removed has not been established because a precise design has not been completed. The proposed access road would use existing picnic area roads to the extent feasible and is planned as a one-way road to reduce the impact area and ease snow removal. Cut and fill data have yet to be outlined, and this information would be deferred until the complete site analysis was submitted.

Construction of an additional parking area adjacent to the park road would be undertaken only if the main parking area proved inadequate to handle visitor loads. The area to be developed has been disturbed by previous road and wastewater treatment facility construction. Fill would be required to bring the 1.2-acre area to the same grade as the road. No trees (other than some seedlings along the road shoulder) would be removed. The existing septic/leachfield system in the same general area as the proposed parking area would be abandoned and structures near the surface removed. The exact area covered by the leachfield is not recorded, but a significant area would be permitted to return to natural biotic productivity.

The entire rim development would remove approximately 4.5 acres from biological productivity and would displace the wildlife dependent upon the habitat. This area would be cleared of vegetation, graded, and leveled, and the surface would be covered by structures or asphalt. The construction activities would moderately, but temporarily, decrease local air quality because of increased dust, particulate matter, and equipment emissions. The disturbed areas on and adjacent to all construction areas would be landscaped and revegetated with native plants to the extent feasible. Most of the roads and buildings in the rim area (totaling approximately 8 acres) would be removed, scarified, landscaped, and revegetated with native plants, a net long-term gain of 1.5 acres returned to biological activity. Constructing a single parking area and combining facilities in a single structure would localize congestion and air pollution from vehicle emissions. These effects are currently distributed over a wider area along the rim. Vehicle emissions should be somewhat reduced because of shorter travel distances and better organized parking.

The second variation proposed under this alternative is construction of 32 cabins in the Goodbye Creek area. A site of 8 to 10 previously undisturbed acres would be considered. The ash/pumice soils are highly unstable, requiring construction away from the canyon rims. The precise

layout of the cabins, office, and parking has not been established, but a total area of approximately 1 acre would be permanently affected. Cabin, office, and parking area construction would require the removal of vegetation and the grading and leveling of the area (1 acre) to be covered with structures or asphalt. Equipment access for installation of the cabin units and utility extensions would impact an additional 1 acre, which would be restored and revegetated following installation. The construction activity would slightly, but temporarily, decrease air quality because of added particulate matter, dust, and equipment emissions to the air. The use of this area would also require a system of trails that would be denuded of vegetation for their entire length. The vegetation adjacent to the trails and surrounding the cabin units would also be trampled, and the soils along the path would be moderately compacted. The open, parklike nature of the predominantly mature mountain hemlock forest would invite short-cutting and broad scale trampling of vegetation. These localized impacts would hasten tree mortality, reduce successful reproduction, and require removal of hazard trees. Careful siting of facilities, low impact construction methods, and intensive revegetation efforts would assist in mitigating some of these impacts. Fencing along walkways and trails might be required to reduce impacts on vegetation and soils. Wildlife in the entire 8- to 10-acre area which did not adapt to human activities would be displaced to adjacent areas.

Other impacts resulting from proposals are included under "Actions Common to All Alternatives."

CULTURAL RESOURCE IMPACTS

Under any of the alternatives, the Crater Lake Lodge and possibly the exhibit building could be removed from the rim. This action would have an adverse impact upon the lodge, which is on the National Register of Historic Places and would have the potential of creating an adverse impact upon the exhibit building (Rim Visitor Center), if it is to be removed. However, the exhibit building might be retained if appropriate use can be found. Prior to implementation of these alternatives, full consultations would be held with the Oregon state historic preservation officer and the Advisory Council on Historic Preservation, in accordance with appropriate historic preservation laws and regulations.

Adaptive use of the old lodge is proposed if proved to be feasible. For the preliminary determination, the Federal Highway Administration did an inclinometer study to test geologic incremental movement around the lodge (letter to D. Galvin, DSC, from R. Wassil, FHWA 1983). Their analysis indicated a very small amount of movement with no catastrophic failure expected (letter on file at the Denver Service Center).

Adaptive use of the lodge would not be adverse because such use would enable it to continue to function as a historic building. Prior to implementation of the alternatives for adaptive use, full consultations would be held with the Oregon state historic preservation officer and the Advisory Council on Historic Preservation, in accordance with appropriate historic preservation laws and regulations.

Under alternative A an interpretive center would be developed in or close to the headquarters area in Munson Valley. The headquarters area is considered an outstanding example of 1930s rustic architecture and is being considered for nomination to the National Register. A new interpretive center, designed in the rustic style, would not directly intrude on the headquarters setting and would be less objectionable than the gas station currently located on the site. An addition to the former ranger dorm (which is currently scheduled for extensive remodeling) could alter the character of the headquarters complex. Should this alternative be adopted, preliminary designs would be prepared, but no action would be implemented until full consultation procedures (as outlined above) were completed.

The alternatives would have no impact upon known archeological resources. A site-specific archeological survey would be conducted and clearance obtained prior to any ground-disturbing actions.

SOCIOECONOMIC IMPACTS

No Action Alternative

Visitors to Crater Lake National Park would continue to enjoy the park in a traditional manner until the lodge was closed. Those seeking an overnight lodging experience would then be denied this opportunity within the park. Other actions to improve the aesthetic qualities of the rim area and to provide quality, year-round interpretive programs might or might not occur; resolution of the lodging issue would generally override consideration of other actions. Needed camper services facilities would unlikely be provided until lodging issues were resolved because of financial uncertainties for the concessioner. The concession would suffer a serious loss of income if the lodge was closed.

Alternative A

Traditional use patterns (lodging, dining, shopping, and interpretive services) would be radically altered under this alternative. Concessioner services, now located in the Rim Village area, would be relocated to a new site in the lower Munson Valley. Return visitors might find this site less appealing for lodging. First-time visitors should find the facility (if well designed) and site (with its proximity to canyons and streams) very attractive. However, the experience of the lodge setting on the rim could not be recaptured. Concession operations should prove more efficient with most facilities concentrated in one location rather than in three locations as proposed under alternative C.

Interpretive services would improve significantly with a new facility in Munson Valley. However, the location would not be ideal because of limited opportunities for outdoor programs and possible conflicts with traffic from NPS housing, maintenance, and administrative areas. Many visitors, particularly those entering from the north, having already experienced the principal feature of the park, might not stop at the interpretive center. Others might first proceed to the rim to see the lake and later return to the Munson Valley interpretive center.

Winter access and programs in the Rim Village area would be significantly reduced under this alternative. Access to the rim area in the winter would be provided (for a fee) by the concessioner with oversnow vehicles. The cost might prove significant. At times, access by oversnow vehicles might prove impossible because of snow conditions. Lack of convenient access to the rim would probably reduce winter visitation. An aggressive marketing effort by the concessioner might help maintain visitation, but it is unknown if a winter lodging operation would be successful without easy access to the rim area.

Accommodations for visitors would improve significantly. Substandard rooms would be eliminated, and the price range would be more varied with three levels of accommodations available.

Facilities desired by campers would be provided under this alternative, improving the experience for those who wish laundry and shower facilities. Campers would no longer have to drive to the Rim Village for basic supplies, reducing travel and somewhat relieving congestion in the rim area.

The aesthetic quality of the rim area would be significantly improved under this alternative. Most structures, parking, and roads would be removed, reducing the noise, congestion, and pollution associated with constant vehicle movement. The rim area would be restored to a pedestrian oriented viewing area with limited vehicle intrusion, more closely resembling the development concept implemented in the 1930s. Rather than serving as the major focal point for visitor activities and services, the Rim Village would become another one of several focal points for interpretation along the rim drive.

Alternative B

Lodging and other concession services would be essentially the same as under alternative A. However, year-round road access to the rim area would be maintained, reducing the cost for visitors that would be incurred under alternative A and making a winter lodging operation more feasible.

Interpretive services would improve significantly over current conditions. Conversion of the cafeteria building to an interpretive center would place these services in a location that would serve a larger percentage of visitors and would better relate to outdoor programs provided in the rim area. Limited concessioner services would remain available in the Rim Village area, which would be particularly important in cold weather when visitors seek a warm beverage and a place to get out of the cold.

The aesthetic quality of the rim area would be significantly improved under this alternative. Parking and roads along the rim would be removed, eliminating the noise, congestion, and pollution associated with constant vehicle movement. New parking facilities would be located below the level of the rim where vehicles would not be seen. Only the Sinnott Memorial would remain on the rim. The interpretive center would sit well back from the rim, making it very difficult to see from other locations

around the rim and from the lake. The entire rim in the village would be a pedestrian oriented viewing area.

Winter experiences in the Rim Village area would change significantly. Snow would no longer be piled along the rim as a result of plowing operations. Access to the rim would be safer but more difficult. The use of snow fencing to make oversnow walkways would be tried but might not prove feasible under some snow conditons. Some visitors might be inconvenienced by the lack of direct access to the rim. To most, the lack of snow berms and asphalt parking areas would improve the visual experience in the winter.

Camper services, varied accommodations, and concessioner operations would be affected as described under alternative A.

Alternative C

Traditional concessioner services would be maintained in the Rim Village area under this alternative. As in alternative A, several levels of accommodations would be provided. Visitors staying at the Goodbye Creek cabins would lack food service onsite, requiring a drive to the rim or a drive or walk to the camper services facility. The potential for winter use of these cabins is somewhat uncertain, but the possibility of a separate ski-touring oriented operation would appear to have potential, particularly if the costs could be kept low. Dividing the concessioner operation would be less efficient than other alternatives.

Retaining lodging on the rim would appeal to traditional visitors. Combining lodging, interpretive center, and day-use facilities at a single location would reduce the spread of facilities on the rim. Some conflicts might occur between various user groups. These conflicts should be minimal because lodge guests tend to leave before the influx of day visitors and arrive after the peak day-use periods. Mornings and evenings should remain a tranquil experience for overnight visitors.

Developing an interpretive center in the lodge complex would present some philosophical problems for traditional NPS managers who wish to maintain an identity separate from the concessioner. This separation could be maintained through thoughtful design of the facility. The advantages of shared community spaces such as lobbies and restrooms and the desire to reduce the spread of development on the rim would outweigh disadvantages of a combined facility.

Development on the rim would continue at a higher level than under the other alternatives, particularly if the old lodge was retained for use. Roads and parking and their associated traffic movement and noise would be removed from the rim as in the other alternatives, but service/emergency access to the old lodge and dormitory would be retained as long as these structures remained. Aesthetically, the rim area would be significantly improved. Winter lodge guests might be stranded when storms forced closure of the access roads. Management would have to be prepared to serve these visitors for periods of two to three days. Visitors would be adequately warned of this possibility, as

they are in other similar winter use areas. Some might find this an inconvenience, others an adventure. Those with reservations who could not reach the lodge would be the most inconvenienced. The duration of road closures would be expected to be reduced over current levels with additional NPS personnel and equipment.

Development of budget cabins, camper services, group camping, and campground expansion would be essentially the same as under other alternatives. The potential addition of concessioner management facilities to the camper services facility would increase vehicular traffic to that area. Incorporating these management facilities in the new lodge or a new employee dormitory would be explored during the design phase.

Housing for concessioner employees in the winter might be less than desirable. Some employees would live in the lodge, either in guest rooms not being used in the winter or in space specifically designed for this purpose. Other employees would be housed in the existing dormitory. Winter access to the dormitory by oversnow vehicles would prove difficult to maintain. Development of employee housing in Munson Valley might prove to be a short-range necessity rather than a long-range possibility.

Adaptive Use of Crater Lake Lodge

If the decision was made to retain the old lodge for uses other than a hotel, visitors to the park would be able to experience an example of early park architecture although the use might change significantly. Using a portion of the lodge for a hostel would provide overnight accommodations at a modest price. This would appeal, in particular, to backpackers and cyclists who currently seek inexpensive lodging and shower facilities in the rim area. Some potential uses for the old lodge would have a limited direct benefit for the park visitor. However, most options would retain the significant interior spaces and these would be open for public viewing.

IMPACTS ON PARK MANAGEMENT

Park operations would change significantly with the change from a lodging season of approximately 90 days to year-round lodging. Additional personnel and equipment would be required to provide round-the-clock security and emergency services. The operation of additional campsites and a new interpretive center would increase annual operation/maintenance costs.

The cost estimates include anticipated operational and maintenance costs associated with the three alternatives. The estimates are probably low, particularly regarding snow removal costs, because it is difficult to predict overtime work if weather conditions are particularly severe.

The cost estimates are based on routine annual maintenance costs and do not include costs for major items such as reroofing, exterior painting, and similar cyclical costs that must be amortized over varied time spans.

To provide a comparison with current costs, the estimates have been divided into three categories: costs associated with the relocation of concession facilities and redevelopment of the Rim Village area; costs associated with new facilities (interpretive center and additional campsites); and one-time costs for equipment and facilities required to house the equipment.

Alternative A

Under this alternative, the road from park headquarters to the Rim Village area would not be plowed in the winter, resulting in a savings of $\pm\$71,400$ annually. Opening the road in the spring would cost $\pm\$15,800$. Maintaining access to the new facilities in the lower Munson Valley and Annie Creek (including year-round maintenance) would cost $\pm\$30,000$ annually. Closure of the Rim Village comfort station in the winter would save $\pm\$6,300$ annually. The net result would be an annual savings of approximately $\$31,900$.

Operating and maintaining a new interpretive center in Munson Valley and the expanded camping facilities at Annie Creek would cost approximately $\$33,600$ annually. This estimate assumes a new center rather than an addition to an existing structure which would be somewhat less costly to operate.

There would be a one-time cost of $\pm\$42,000$ to acquire an oversnow vehicle for emergency access to the rim area.

Alternative B

The cost of maintaining winter access to the Rim Village area would remain approximately the same as current annual costs of $\$71,400$. There would be minor savings (approximately $\$4,000$ annually) because the roads to the lodge and dormitory would not have to be plowed in the spring. Removing the Rim Village comfort station would save annual operation/maintenance costs of $\pm\$9,800$. Costs for maintaining access to the new facilities in the lower Munson Valley and Annie Creek are the same as alternative A ($\$30,000$). The net result would be an annual increase of approximately $\$16,200$.

Converting the cafeteria to an interpretive center would cost $\pm\$76,000$ annually for operation and maintenance. Operating and maintaining new camping facilities would cost $\pm\$6,400$ annually for a total of approximately $\$82,400$ for these new services.

No additional equipment would be required under this alternative.

Alternative C

Maintaining 24-hour access (except in the most severe storms) to the Rim Village lodge and ensuring visitor safety would require a significant investment in equipment and personnel. Annual costs to maintain 24-hour

access to the Rim Village is estimated at \$230,000 over the current cost of \$71,400. However, these costs could be reduced substantially if winter lodging was not provided or if the public accepted the possibility of being isolated until the roads could be reopened. Maintaining access to the facilities at Goodbye and Annie creeks would cost \pm \$11,300 annually. Removing the Rim Village comfort station would save \pm \$9,800 as described under alternative B. The net result would be an annual increase of approximately \$231,500.

Operating an interpretive center in the Rim Village lodge complex would cost \pm \$25,000 annually. This estimate might be high--actual costs are dependent on the design of the facility and division of responsibilities with the concessioner. Costs associated with new camping facilities would be the same as the other alternatives (\$6,400) for a total annual cost of \$31,400.

The one-time cost to acquire additional snow removal equipment, a fire truck and ambulance, and other emergency equipment is estimated at \pm \$406,000, plus an additional \$250,000 to provide a storage building for the equipment, bringing the total to approximately \$656,000.

Renovation/Adaptive Use of Crater Lake Lodge (see appendix A)

If the lodge was renovated and retained for adaptive use, annual operation/maintenance cost would range from \pm \$8,500 to \pm \$38,450. The lower cost assumes that only the main public spaces would be used; the higher cost would be for utilization of the full structure. Actual costs would depend on the use options selected. Personnel costs for providing visitor services are not included. Opening an access road and parking area each spring would cost between \$4,000 and \$6,000, depending on the access road alignment. This includes the cost to provide access to the employee dormitory. Once the dormitory was removed, these costs would be reduced somewhat.

Summary

	<u>Alt. A</u>	<u>Alt. B</u>	<u>Alt. C</u>
Change in annual costs because of relocation of concession facilities and redevelopment of the Rim Village	\$-31,900	\$+16,200	\$+231,500*
Increases due to new services/facilities	<u>+33,600</u>	<u>+82,400</u>	<u>+ 31,400</u>
TOTAL	\$ 1,700	\$ 98,600	\$ 262,900
One-time equipment/facilities cost	\$ 42,000	-0-	\$ 656,000*
Annual cost to maintain old lodge for adaptive use	\$12,500 to \$44,450		

*Based on maintaining year-round access on a 24-hour basis to the extent feasible.

SUMMARY OF MAJOR IMPACTS

<u>CATEGORY</u>	<u>ACTIONS COMMON TO ALL ALTERNATIVES</u>	<u>NO ACTION</u>	<u>ALTERNATIVE A</u>	<u>ALTERNATIVE B</u>	<u>ALTERNATIVE C (Preferred)</u>
NATURAL RESOURCES					
Vegetation	3.0-5.5 acres of complete vegetation removal due to construction of the camper services facility, budget cabins, and campground expansion.	1.5-3.0 acres of complete vegetation removal due to construction of the camper services facility and campground expansion.	3.0-5.5 acres of complete vegetation removal due to construction of the camper services facility, budget cabins, and campground expansion.	3.0-5.5 acres of complete vegetation removal due to construction of the camper services facility, budget cabins, and campground expansion.	3.0-5.5 acres of complete vegetation removal due to construction of the camper services facility, budget cabins, and campground expansion.
	20-25 acres of selective tree removal due to campground expansion and installation of budget cabins.	13-15 acres of selective tree removal due to campground expansion.	20-25 acres of selective tree removal due to campground expansion and installation of budget cabins.	20-25 acres of selective tree removal due to campground expansion and installation of budget cabins.	20-25 acres of selective tree removal due to campground expansion and installation of budget cabins.
	Slight to moderate plant trampling due to use of area. Approximately 6 acres scarified, land-scaped, and revegetated.	Slight to moderate plant trampling due to use of area. Approximately 6 acres scarified, land-scaped, and revegetated.	Slight to moderate plant trampling due to use of area. Approximately 6 acres scarified, land-scaped, and revegetated.	Slight to moderate plant trampling due to use of area. Approximately 6 acres scarified, land-scaped, and revegetated.	Slight to moderate plant trampling due to use of area. Approximately 6 acres scarified, land-scaped, and revegetated.
			0.1 acre of previously impacted area completely impacted with total vegetation removal to construct Munson Valley reception/interpretive center.		3 acres of complete vegetation removal due to new access road, lower level parking, Goodbye Creek cabins and Rim Village building expansion.
			8 acres of complete vegetation removal in lower Munson Valley to provide a central concession facility, access, parking, and a sewage disposal site.	8 acres of complete vegetation removal in lower Munson Valley to provide a central concession facility, access, parking, and a sewage disposal site.	4-5 acres of selective tree removal to install cabins at Goodbye Creek.
Wildlife	3.0-5.5 acres of habitat removal.	1.5-3.0 acres of habitat removal.	11-13 acres of habitat removal.	11-13 acres of habitat removal.	6-8.5 acres of habitat removal.
	20-25 acres of selectively reduced habitat. Approximately 6.0 acres of restored habitat.	13-15 acres of selectively reduced habitat. Approximately 6.0 acres of restored habitat.	21-29 acres of selectively reduced habitat. Approximately 6.0 acres of restored habitat.	21-29 acres of selectively reduced habitat. Approximately 6.0 acres of restored habitat.	24-30 acres of selectively reduced habitat. Approximately 6.0 acres of restored habitat.

<u>CATEGORY</u>	<u>ACTIONS COMMON TO ALL ALTERNATIVES</u>	<u>NO ACTION</u>	<u>ALTERNATIVE A</u>	<u>ALTERNATIVE B</u>	<u>ALTERNATIVE C (Preferred)</u>
	Displaced wildlife from 25-30 acres due to inadaptability to human use of areas.	Displaced wildlife from 14.5-18 acres due to inadaptability to human use of areas.	Displaced wildlife from 32-42 acres due to inadaptability to human use of areas.	Displaced wildlife from 32-42 acres due to inadaptability to human use of areas.	Displaced wildlife from 30-38 acres due to inadaptability to human use of areas.
Endangered/ Threatened Plants or Animals	No Impact	No Impact	No Impact	No Impact	No Impact
Soils/Geology	3-6 acres of surface soil disturbance and moderate soil compaction due to building installation, campsite preparation, vehicular access, and use of trail systems.	2-3 acres of surface soil disturbance and moderate soil compaction due to building installation, campsite preparation, vehicular access, and use of trail systems.	11-13 acres of surface soil disturbance and moderate soil compaction due to building installations, campsite preparation, vehicular access, and use of trail systems.	11-13 acres of surface soil disturbance and moderate soil compaction due to building installations, campsite preparation, vehicular access, and use of trail systems.	6-9 acres of surface soil disturbance and moderate soil compaction due to building installations, campsite preparation, vehicular access, and use of trail systems.
	Approximately 6 acres of surface disturbed for restoration.	Approximately 6 acres of surface disturbed for restoration.	Approximately 6 acres of surface disturbed for restoration.	Approximately 6 acres of surface disturbed for restoration.	Approximately 6 acres of surface disturbed for restoration.
Air Quality	Slight, but temporary, decrease in quality from dust and vehicular emissions due to construction.	Slight, but temporary, decrease in quality from dust and vehicular emissions due to construction.	Slight, but temporary, decrease in quality from dust and vehicular emissions due to construction.	Slight, but temporary, decrease in quality from dust and vehicular emissions due to construction.	Slight, but temporary, decrease in quality from dust and vehicular emissions due to construction.
Water Resources/ Floodplain	crease slightly. Slight increase in runoff. Slightly less potential for lake pollution from petroleum products because of discontinued use of rim access areas. No impact on floodplain or wetlands.	Consumption would increase slightly. Slight increase in runoff. Slightly less potential for lake pollution from petroleum products because of discontinued use of rim access areas. No impact on floodplain or wetlands.	Consumption would increase slightly. Slight increase in runoff. Slightly less potential for lake pollution from petroleum products because of discontinued use of rim access areas. No impact on floodplain or wetlands. Temporary increase in silt and sediment in Munson Creek due to bridge construction.	Consumption would increase slightly. Slight increase in runoff. Slightly less potential for lake pollution from petroleum products because of discontinued use of rim access areas. No impact on floodplain or wetlands. Temporary increase in silt and sediment in Munson Creek due to bridge construction.	Consumption would increase slightly. Slight increase in runoff. Slightly less potential for lake pollution from petroleum products because of discontinued use of rim access areas. No impact on floodplain or wetlands.
CULTURAL RESOURCES	Adverse effect if lodge is removed.	Adverse effect if lodge is removed.	Adverse effect if lodge is removed.	Adverse effect if lodge is removed.	Adverse effect if lodge is removed.

Appendixes

APPENDIX A: POTENTIAL ADAPTIVE USES FOR CRATER LAKE LODGE

This section summarizes some of the potential uses being considered for Crater Lake Lodge and the costs associated with renovation and adaptive use. The "Environmental Consequences" section primarily addresses the changes that will occur in the visitor experience when the lodge is no longer used as a hotel but does not attempt to assess all impacts associated with continued use or removal of the lodge. These issues are being addressed in a separate case study in compliance with the procedures prescribed for actions affecting structures on the National Register of Historic Places.

The lodge could be retained for adaptive use under any of the alternatives, recognizing that an access road and some parking would be required. Retention of the lodge is indicated only on the illustration of alternative C, the alternative retaining the most development in the Rim Village area.

Under any of the alternatives, the former lodge would be somewhat isolated from the center of visitor activity. Public access would be by walkways. Therefore, potential uses would be supplemental to the primary visitor experience. Because of snow removal problems, the building would only be used in the summer.

Restaurant/Lounge

The old lodge could remain as a restaurant and lounge associated with the hotel operation. Some first-floor guest rooms could be restored as

exhibits, but the guest room wings and upper floors would remain unused. The significant interior spaces would be restored and their traditional use could continue. Guests would walk to the dining facility, or the concessioner could provide a shuttle service. This option is most feasible under alternative C but could be implemented under any alternative if further studies indicated that such an operation would be economically feasible.

Art/History Museum

The old lodge could be adapted as a museum of regional art and history, preferably with an artist-in-residence program. The significant interior spaces could be preserved and used for displays and demonstrations. The kitchen could be remodeled and used for studio space. Some first-floor guest rooms could be preserved as exhibits, some could serve as small galleries, and some could be used as employee quarters. Preferably, the programs would be operated through a cooperating association. Visitors would walk to the museum from the central parking area.

Environmental Education/Research Center

Use of the old lodge could be directed primarily towards school groups and special interest organizations. The significant interior spaces could be preserved and used for displays and demonstrations. Other areas could provide office space and labs for research personnel, and first-floor rooms could provide quarters. Preferably the center would be run by a cooperating educational institution, with the National Park Service providing some staffing for interpretation plus some maintenance. The limited season (summer only) would be a disadvantage for school groups wishing to use the facility. High lodging costs within the park might limit organized group use. Budget cabins and a group campsite would increase opportunities for some organizations.

Hostel

The first-floor wings currently contain 16 guest rooms (14 with toilets and lavatories, 2 with full baths). To maximize beds, the individual bathrooms would not be replaced during renovation, and central toilet and shower facilities would be provided. A lounge and community kitchen would be provided. The hostel would be operated by a private organization, possibly in conjunction with other uses described above.

Removal of Wings

One or both guest room wings could be removed, reducing maintenance costs and restoring the lodge to an earlier configuration. Uses for the remaining structure could be as described above except for the hostel.

Use of Upper Floors

Public use of the upper floors would require extensive remodeling which has not proven cost-effective. National building codes for employee use of upper floors are generally less restrictive than codes for public use. Therefore, under the above options, employees could work and/or be housed on the upper floors of the structure, but public use has not been considered. The above uses could be combined in a number of ways. For instance, a hostel could be combined with the art/history museum, and employee housing could be provided on the upper floors.

Renovation/Adaptive Use Costs

Correcting structural deficiencies and general rehabilitation of the main public spaces (entry, great hall, and dining room) would cost approximately \$3.3 million, including a 15 percent contingency for unexpected complications common to remodeling projects. This is the base cost to provide a structurally sound building and basic restoration of the public rooms and exterior. Costs to adapt the structure vary with the possible uses.

To continue use as a dining/lounge facility (with no use of the wings or upper floors) would add approximately \$120,000 to the cost, primarily for kitchen rehabilitation. To adapt the first-floor wings for such possible uses as offices, employee quarters, and/or exhibit space would cost between \$172,000 and \$200,000, depending on specific uses. Conversion of the first-floor wings to a hostel would increase these costs somewhat because of requirements for additional life safety features.

Renovating the upper floors for employee housing would add an additional \$280,000 to \$615,000, depending on the number of rooms to be provided. The lower amount would provide rooms above the first-floor public rooms, while the higher amount would cover the cost of all the upper floors.

Costs were not calculated for removal of the wings. While renovation costs would be reduced by eliminating the wings, these savings may be offset by the demolition costs and work required to restore the end of the original structure. There would be long-term savings in operational and maintenance costs if the wings were removed.

In summary, the basic cost to renovate the structure would be approximately \$3.3 million, and total costs for adapting the structure for continued use would range from approximately \$3.5 to \$4.3 million (excluding most furnishings and equipment). This amount compares with the estimated cost of \$8.6 million (1984 dollars), excluding equipment and furnishings to renovate the building as a hotel with public use of all floors.

Summary--Adaptive Use

The high cost to renovate the lodge for limited use, the uncertainties over the long-term stability of the site, and management objectives to

reduce development on the rim indicate that ultimately the lodge should be removed. Before any decision is made, alternatives for financing renovation and continued use will be further explored, public comments will be given full consideration, and formal consultation procedures with the state historic preservation officer and the Advisory Council on Historic Preservation will be conducted.

Approval of a plan for the provision of essential visitor services and facilities, as outlined in this document, will not preclude preservation of the lodge should that be the ultimate decision.

APPENDIX B: SUMMARY OF PROJECTED DEVELOPMENT COST, CRATER LAKE DCP

	<u>ALTERNATIVE</u>		
	A	B	C
<u>RIM VILLAGE</u>			
Demolition of roads, parking, structures/grounds restoration	\$597,000	\$587,000	\$364,000
Access roads/parking	--	532,800	695,000
Utility extensions	95,000	200,000	268,000
Remodel cafeteria for interpretive center	--	580,000	--
Lodge/garage	--	--	2,866,000
Visitor services/interpretive center	--	--	720,000
<u>MUNSON VALLEY</u>			
Relocate gas station/site improvements	70,000	35,000	35,000
Interpretive center/utility extensions	910,000	--	--
<u>LOWER MUNSON VALLEY</u>			
Lodge/cabins	3,320,000	3,320,000	--
Access road, parking, site improvements	755,000	755,000	--
Utilities	324,000	324,000	--
Dormitory/management facilities	1,302,000	1,302,000	--
<u>GOODBYE CREEK</u>			
Cabins/office	--	--	780,000
Road, parking, site improvements	--	--	195,000
Utilities	--	--	460,000
<u>ANNIE CREEK</u>			
Camper store, laundry, shower, gas	120,000	120,000	120,000
Budget cabins (1st phase)	234,000	234,000	234,000
Access roads, parking, site development	203,000	203,000	203,000
Utilities	50,000	50,000	50,000
Management facilities (offices, laundry, maintenance)	--	--	200,800
SUBTOTAL	\$7,980,000	\$8,242,800	\$7,190,800
If management facilities constructed as part of lodge, add	--	--	73,000+
If employee dorm replaced in Munson Valley, add	--	--	1,100,000*
If additional parking (overflow) required, add	--	--	180,000
TOTAL	\$7,980,000	\$8,242,800	\$8,543,800
Rehabilitation/adaptive use of old lodge, add	\$3,500,000 to \$4,300,000		

Notes: Projections do not include costs for development of group campsite or expansion of Mazama Campground, common to all alternatives but considered long-range projects. Projections are based on averages for NPS construction in remote areas with heavy snow loads. Potential savings through salvage and/or reuse of existing materials or equipment have not been included. These projections should be used only for comparison of the relative cost of the alternatives, not for actual construction estimates. Costs could vary considerably depending on site conditions, actual facility design, phasing, and other variables.

*New construction including management offices. If existing dorm was relocated, costs would be reduced.

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Publication services were provided by the graphics and editorial staffs of the Denver Service Center. NPS 2180

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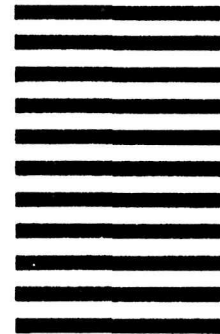


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COMMENTS

How would you rate each of the three suggested alternatives for development concepts at Crater Lake National Park? *(Circle one answer for each alternative)*

Rate the Alternatives

		Excellent	Good	Fair	Poor	Not Acceptable	Undecided
Q1.	Alternative A	6	5	4	3	2	1
Q2.	Alternative B	6	5	4	3	2	1
Q3.	Alternative C	6	5	4	3	2	1

Q4. Is there another alternative that you would prefer over the three mentioned above?

- 1 No
2 Yes (Please describe)

In your opinion, how important are each of the following objectives in finalizing the Development Concept Plan for Crater Lake NP? *(Circle one answer for each item)*

		<u>How Important Is Each Objective?</u>			
		Very Important	Moderately Important	Of Little Importance	Not Important
Q5.	Provide higher quality interpretive facilities at Crater Lake	4	3	2	1
Q6.	Provide year-round interpretive programs at Crater Lake	4	3	2	1
Q7.	Improve quality of overnight lodging	4	3	2	1
Q8.	Provide year-round lodging, if possible	4	3	2	1
Q9.	Provide overnight lodging in Rim Village area	4	3	2	1
Q10.	Ensure that overnight lodging (cabins, guest lodge) exists in a variety of price ranges	4	3	2	1
Q11.	Provide group camping opportunities at Annie Creek	4	3	2	1
Q12.	Add walk-in campsites at Mazama Campground	4	3	2	1
Q13.	Maintain road access to the Rim Village area in the winter	4	3	2	1
Q14.	Minimize visual intrusions (roads, parking, and structures) and environmental impacts in and around Rim Village	4	3	2	1
Q15.	Which of the above objectives (Q5-Q14) are most important? <i>(Put number of objective in appropriate box)</i>				

Most Important

Second Most Important

Third Most Important

Q16. To what degree should visual intrusions (roads, parking, and excess structures) and congestion in the Rim Village area be reduced? *(Circle one number)*

- 1 Remove all structures except comfort station, Sinnott Memorial, and exhibit building. Remove all parking and roads except for 80 spaces (and road access) near Sinnott Memorial.
- 2 Retain Sinnott Memorial and cafeteria. Convert portion of cafeteria to interpretive center. Construct new parking area for 320 cars behind cafeteria. Remove all existing roads, parking, and other structures.
- 3 I do not feel that visual intrusions and congestion are problems in the Rim Village area at the present time.
- 4 Other _____

Q17. If new interpretive facilities are developed at Crater Lake, where do you feel they should be located? *(Circle one number)*

- 1 In a facility in Munson Valley
- 2 In a facility in Rim Village
- 3 No opinion
- 4 Other (explain) _____

Q18. Which of the following lodging alternatives do you most prefer? *(Circle one number)*

- 1 All lodging (except budget cabins) to be located in lower Munson Valley
- 2 A new lodge in Rim Village, cabins at Goodbye Creek, and budget cabins at Annie Creek
- 3 No preference
- 4 Other (explain) _____

Q19. Assuming that the Crater Lake Lodge cannot be maintained for its present uses, which of the following best describes your opinion regarding its future? *(Circle one number)*

- 1 The lodge should not be retained.
- 2 The lodge should be retained for alternative uses if the anticipated costs can be held to reasonable levels in relation to the benefits.
- 3 The lodge should be retained for alternative uses regardless of the costs involved.

Q20. Do you have any other comments regarding the current Development Concept Plan for Crater Lake National Park?

NAME

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