

Appendices

Management Strategy

McKenzie Pass - Santiam Pass National Forest Scenic Byway

Sisters Ranger District

Deschutes National Forest

McKenzie Ranger District

Willamette National Forest

Pacific Northwest Region

DRAFT

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Appendices

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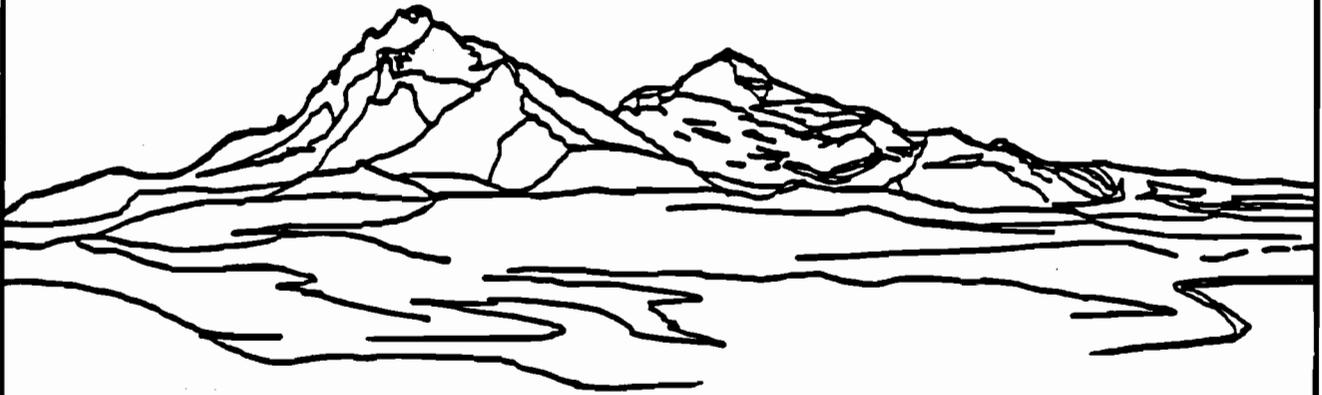
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Appendix A: Nomination Report

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MCKENZIE-SANTIAM PASS LOOP
SCENIC BYWAY



NATIONAL FOREST SCENIC BYWAYS

NOMINATION REPORT

for

McKENZIE-SANTIAM PASS LOOP SCENIC BYWAY

Region 6 - USDA Forest Service

**Willamette National Forest
Deschutes National Forest**

January 27, 1989

Preparers: Phil Raab, Frank Hunsaker, Willamette NF

Regional Contact: Ron Walters, Division of Recreation, R-6

EXECUTIVE SUMMARY

The McKenzie-Santiam Pass Loop is a combination of three state highways located entirely within the proclaimed boundaries of the Deschutes and Willamette National Forests.

Spectacular scenery, interesting Cascade Mountain geology, a rich cultural/historic resource, varied vegetative environments, a Wild and Scenic River, excellent examples of multiple-use management, and a variety of supporting facilities, both Forest Service and private sector, make this an ideal candidate for consideration.

The proposal meets all nomination criteria. It is an existing paved route of at least two lanes throughout its length. The route is within Forest boundaries, and all of it is presently used for recreational driving by passenger cars. Other jurisdictions support designation as a Scenic Byway, and this designation would be consistent with Forest plans.

National Forest Scenic Byways program goals are also met in this route. Public awareness, understanding, and enjoyment can be greatly enhanced by interpretive and marketing efforts. The proximity of the loop (within two and one-half hours drive) to the major urban centers of the state make reaching traditionally underserved groups a realistic goal. On-site qualities along the route provide excellent opportunities to interpret geology, historical/cultural values, vegetation and multiple-use management for the benefit and enjoyment of the motorist.

Several partnership programs have been initiated that directly involve the route. Potential partnerships for the future abound.

In summary, all the qualities desired in a Scenic Byway are found along this route. The motoring public already uses the proposed route for a scenic drive experience. It is well known and highly recommended throughout the Pacific Northwest. A portion of the route is designated by the State of Oregon as a State Historic and Scenic Highway.

DESCRIPTION OF THE PROPOSED ROUTE

Statement of Significance

The proposed route constitutes a 81.5 mile loop in the central portion of Oregon's Cascade Mountains; utilizing Oregon Route 242, US 20, and ORE 126. This popular drive provides access to a high quality Wild and Scenic River, diverse recreation opportunities, a historic travel route, and scenery of unparalleled splendor.

Oregon 242, the McKenzie Highway, has long been recognized by the USDA Forest Service and the public in general as being one of the state's premier scenic and recreational highways. Significance of this route was further recognized when the Oregon State Legislature, under the provisions of Senate Bill 643, authorized the Oregon Transportation Commission to conduct a study of the historic, scenic, and cultural values of the state highway system. This eventually led to the designation of a significant segment of the McKenzie Highway as a state Historic and Scenic Highway.

Recent Cascade mountain vulcanism, spectacular lakes, and vibrant fall colors draw thousands each year. In 1939 the McKenzie Highway was constructed to the standard seen today, with few changes having occurred in the intervening years. A low speed, highly scenic route awaits those who want to sample the landscapes of Western Oregon, the High Cascades, and Central Oregon. The Scott Wagon Road, a pioneer travel route through the Cascades, adds to the historic interest of the route.

The portion of US 20 between the town of Sisters, Oregon, and the junction of ORE 126 is a primary travel route between the Willamette Valley and Central Oregon. This segment provides outstanding scenery, access to a number of summer and winter recreation sites (both public and private), and serves an important role in the tourism of the central Cascades area. The forested environment provides a large degree of contrast to the extensive lava flows seen along the McKenzie Pass segment.

Highway 126, the final segment of this loop, parallels the McKenzie River, which has been designated as a Recreation River under the National Wild and Scenic Rivers Act. Spectacular scenery, a National Recreation Trail, fishing, whitewater rafting, and associated campgrounds combine to make this segment a recreationist's delight.

Each of the segments with their scenic, recreational, and cultural uniqueness provide the user an experience of great variety and interest.

Location and Scope

1. The entire route is part of the state highway system and lies wholly within the proclaimed boundaries of the Deschutes and Willamette National Forests. The loop traverses parts of Deschutes, Jefferson, Lane, and Linn counties.

2. All 81.5 miles of the route is under Oregon Department of Transportation jurisdiction.

3. Landmarks, particularly the geologic ones, read like a litany from a geology text book. Some of those include: the major volcanic peaks of the central Cascades in Oregon (the Three Sisters, Mt. Washington, Three Finger Jack, and Mt. Jefferson), minor volcanic vents (Belknap Crater, Sand Mountain, Yapoah and Black Craters to name a few) with lava flows as recent as 800 years. Portions of the route traverse vast moonscape-like lava flows devoid of all vegetation.

Several spectacular lakes are visible or accessible from this proposed Byway. Clear Lake, the source of the McKenzie River, is nationally known for its water clarity. Trees were inundated by rising waters when the McKenzie River was dammed by a lava flow 3,000 years ago. They are still visible today standing beneath the water. Three popular and highly visited waterfalls are adjacent to the route. Two of the waterfalls are on an impressive whitewater section of the McKenzie Wild and Scenic River.

Other significant landmarks include views into three wildernesses (Three Sisters, Mt. Washington, and Mt. Jefferson), of which the Three Sisters has been designated by the United Nations as a part of the "Programme on Man and the Biosphere" as a reserve. The vegetative environments include forests of two hundred-foot tall Douglas-fir, western and mountain hemlock, lodgepole pine, ponderosa pine, and mixed conifer forests. The display of fall colors from maples and other deciduous vegetation attract many viewers.

Points of historic and cultural interest include Dee Wright Observatory at the summit of McKenzie Pass, Scott Wagon Road, Old Santiam Pass Wagon Road, Fish Lake Remount Station, a facility dating to the mid-1800s and for years a Forest Service administrative site. The second oldest ski area in the state is located on Santiam Pass. The Pacific Crest National Scenic Trail crosses the route at both McKenzie and Santiam passes. Of more recent vintage are the facilities in the community of Sisters, which have an old west flavor and are in themselves attractions for the travelling public.

4. Approximately 60 percent of the state's population is within two-and-a-half hours driving time of the route. Major communities include: Eugene/Springfield - 55 miles, Corvallis/Lebanon - 65 miles, Salem - 50 miles, Portland - 130 miles, and Bend - 21 miles.

5. The route has the following support facilities:

FS Facilities	
Campgrounds/Picnic Areas	15
Viewpoints	4
Interpretive sites	2
Trailheads	13
Ski area	1
Sno-parks	6

Facilities operated under FS Special-Use Permits

Organization camps	3
Resorts	3

Private sector

On the west end of the loop the community of McKenzie Bridge offers private resorts, cabins, restaurants, service stations, outfitting/guiding services on the McKenzie River, and a golf course.

The town of Sisters, located at the easterly end of the loop offers private resorts, motels, restaurants, service stations, outfitting/guiding services for various rivers and wildernesses, golf courses, and complete retail services for the recreating public. Black Butte Ranch, a condominium development with full services, lies along the route. A short distance off the route is the Metolius River, also a federally designated Wild and Scenic River, its associated campgrounds, and the community of Camp Sherman, which offers commercial tourist facilities.

RESPONSE TO NOMINATION CRITERIA

The proposed Byway must be an existing road with a current or potentially high degree of scenic value and may include recreational, historical, educational, scientific, or cultural features. These values and features must be of National or State significance.

This proposal fully meets criteria as described. The variety of magnificent scenery makes this a Scenic Byway in the truest sense of the word. Please note the above descriptions and enclosed photographs.

State actions in recognizing the McKenzie Pass portion of the route as a State Historic and Scenic Highway certainly establishes its statewide significance. Inclusion of a large portion of Highway 126 and the McKenzie River National Recreation Trail within the McKenzie Wild and Scenic River corridor brings a level of national recognition.

In addition to the scenic values, historical, educational, and scientific values are also present. While the full potential is yet to be tapped in these areas, the potential through a program of planned interpretation seems to be large. Present use by the public of those currently existing sites is heavy.

Annually, publications ranging from Sunset Magazine to feature stories in local papers laud the recreational opportunities along this route.

The nomination must be an existing route, located primarily within a National Forest and have public access.

All of the above criteria are met. The McKenzie Pass segment is closed in the winter due to snow (usually for early November to July 4). During the winter months both nordic skiers and snowmobilers use the route as a travelway.

The route may include segments under other jurisdictions. Written agreements must be obtained with those having jurisdiction indicating their concurrence with being designated as a National Forest Scenic Byway.

All written agreements with the Oregon Department of Transportation have not yet been received. Verbal agreements have been made, and written documentation is being prepared. Before any activities take place, formal written agreements will be obtained.

The route must be safe for recreational driving in a passenger car. (Unpaved roads can be nominated for Scenic Byways.)

The entire route is paved and is driveable by passenger car.

One of the unique characteristics of the McKenzie Pass segment is that it is recommended only for passenger car travel. Facility design along this portion reflects that use pattern. Here is an opportunity for the modern day traveler to experience highway design and speeds from another era. The whole pattern of scenery, travel speed, and facilities represent an opportunity for the motorist to have a unique and rewarding recreational experience.

The nomination of the route as a Scenic Byway must be consistent with Forest Plan direction.

The Forest Plans (drafts thereof) recognize the unique values of these highway segments. Recognition is through the visual management system while allowing for a wide range of multiple uses to occur within identified standards and guidelines.

The Forest Plans have anticipated the values of these scenic routes and fit "hand in glove" with this proposal.

SELECTION CRITERIA

The McKenzie-Santiam Pass Loop meets the Scenic Byways program goals in the following fashion. (Each goal has its own response.)

Showcase outstanding National Forest scenery.

The entire route takes the motorist through some of the best scenery on National Forest lands in the Pacific Northwest. The range of opportunity to view both old- and second-growth Douglas-fir forests, pure water, glacier clad peaks, lava flows representing various periods of volcanic activity, the pine forests of eastern Oregon, and the juniper/sagebrush edge of the High Desert is what the Oregon experience is all about.

Increase the publics' understanding of the National Forests as the major provider of outdoor recreation.

Byway designation will affect two categories of users. For those who have travelled this route in years past, it will be a way to bring to their

attention the varied opportunities. For the first time customer, there is the opportunity to introduce a whole new experience.

The route presently passes numerous recreation opportunities ranging from the primitive to the highly developed. Presented as a package, the public will soon realize that the National Forests provide a myriad of opportunities and possibilities. With use will come a realization of potential.

Increase public awareness and understanding of all National Forest activities.

Current National Forest management regimes along the route represent the rather extensive product line offered by the National Forest System. Those products include timber, clear water, developed recreation, wilderness and trails, wildlife and their habitats, fisheries management, power production, geothermal resources, historical and cultural foundations of the Northwest, the role of the private sector on National Forests, and the benefits of a National Forest adjacent to private sector lands.

The raw material to tell the story is there aplenty; the challenge is to develop the means and medium by which to communicate with the customer. At locations where the story is being told, the public is enjoying those efforts.

Meet the growing demand of driving for pleasure as a significant recreation use.

Unique route identification by logo, theme, and marketing will draw the public's attention. Marketing efforts coupled with the natural attributes of the route will make this a highly desirable loop type of driving experience. Proximity to the majority of the State's population affords an excellent alternative to the long distance trip.

Increase the use of the National Forests by non-traditional users including urban minorities, the disadvantaged, and the elderly.

Here again, location is ideal to reach these underserved groups. It does not involve either large investments in travel time, specialized equipment, or money to travel the route for an outing of a day. The route becomes the ideal change of pace.

Portions of the loop are presently served by public transportation and tour type trips are becoming more and more popular. Several handicapped accessible campgrounds, trails, and viewpoints are presently in place.

Contribute to the Nation's overall Scenic Byways effort.

This route represents its own unique scenery, recreation, and travel opportunities that reflect the diversity of the nation's National Forests. By capturing this, the public is afforded the opportunity to appreciate such national diversity.

Relatively young lava flows, peaks clad with glaciers, 37 degree waters with 100+ foot visibility, old-growth Douglas-fir, waterfalls, parts of the national wilderness treasure, and cultural history are represented in a combination not to be found elsewhere.

OPPORTUNITIES

Outstanding characteristics and features.

There are some three groupings of outstanding features and characteristics.

Geology. Outstanding example of Cascade Range geologic forces.

Vegetation. The variety of forest and vegetation types representative of western and eastern Oregon.

History. Both prehistoric and historic cultural resources abound.

Interpretive focus.

Each of the three groupings listed above can readily be interpreted along the route. In addition, there are numerous individual sites which have potential for interpretation.

PARTNERSHIPS

Three partnerships are currently nearing finalization along parts of the route.

The first is a tourism promotion effort at the Leaburg Fish Hatchery site on the lower McKenzie River. While the actual physical location of the site lies to the west of the Scenic Byway it acts as a gateway to the upper McKenzie River country. The Byway will play a major role in the visitor information/economic development effort. Partners in the project include:

Willamette National Forest
Lane County
Soil and Conservation Service
Oregon Department of Fish and Wildlife
University of Oregon
Cascade Pioneer Council
McKenzie Chamber of Commerce

Second is a fisheries management interpretation project for the McKenzie River. The Byway adjoins several of the interpretive sites. Cooperators in this project are:

The Willamette National Forest
Oregon Department of Fish and Wildlife
Eugene Water and Electric Board

The third are two entry information stations being developed along Hwy 20 west of Sisters. The Metolius information station is to be located on Forest Road 14 near its junction with Hwy 20 (Camp Sherman turnoff). The Suttle Lake information station is to be located on Forest Road 2070 near its junction Hwy 20. These two sites will provide tourists and recreationists with readily

accessible, complete, and up-to-date information on virtually all the summer and winter attractions on both National Forest and private lands in the Metolius Basin/Santiam Pass area. Partners in this project are:

The Deschutes National Forest
The Metolius Recreation Association
The Oregon Department of Fish and Wildlife

KEY MANAGEMENT CONSIDERATION

The McKenzie Pass Highway portion of the route has been submitted as a project for the Public Lands Highway Program. It is proposed as a rehabilitation project. The stated purpose is to provide a small scale, low-speed scenic route offering user safety and enhanced recreational experiences while remaining subordinate to the natural landscape. Design and interpretive emphasis will be on the cultural history and geology of the area.

MCKENZIE-SANTIAM PASS SCENIC BYWAY

To Salem 80 mi.

To Sweet Home 44 mi.
To Albany 70 mi.

MT JEFFERSON
WILDERNESS

Three
Fingered
Jack

SANTIAM
PASS

HOODOO
SKI AREA

Suttle Lake
Blue Lake

Clear Lake

Big Lake

Sahale Falls
Koosah Falls

MT WASHINGTON

Mt Washington

WILDERNESS

NATIONAL

MCKENZIE PASS

DEE WRIGHT
OBSERVATORY

To Redmond
19 mi.

Sisters

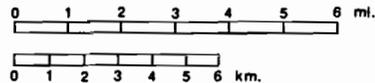
To Bend
21 mi.

RIVER

Scott Lake

THREE SISTERS

CREST



WILDERNESS

North Sister

Middle Sister

PACIFIC

McKenzie
Bridge

MCKENZIE

To Eugene
50 mi.

Proxy
Falls

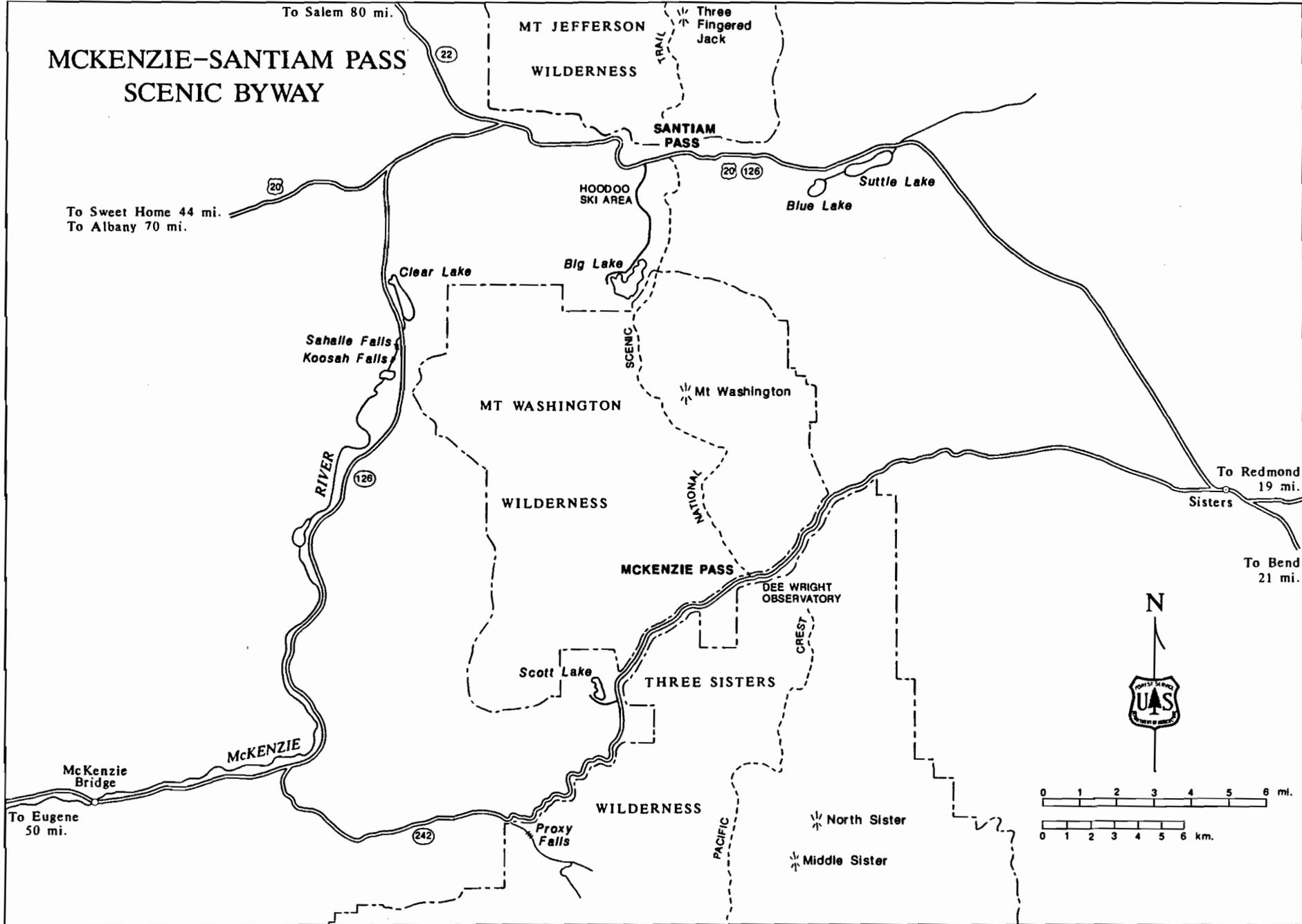
242

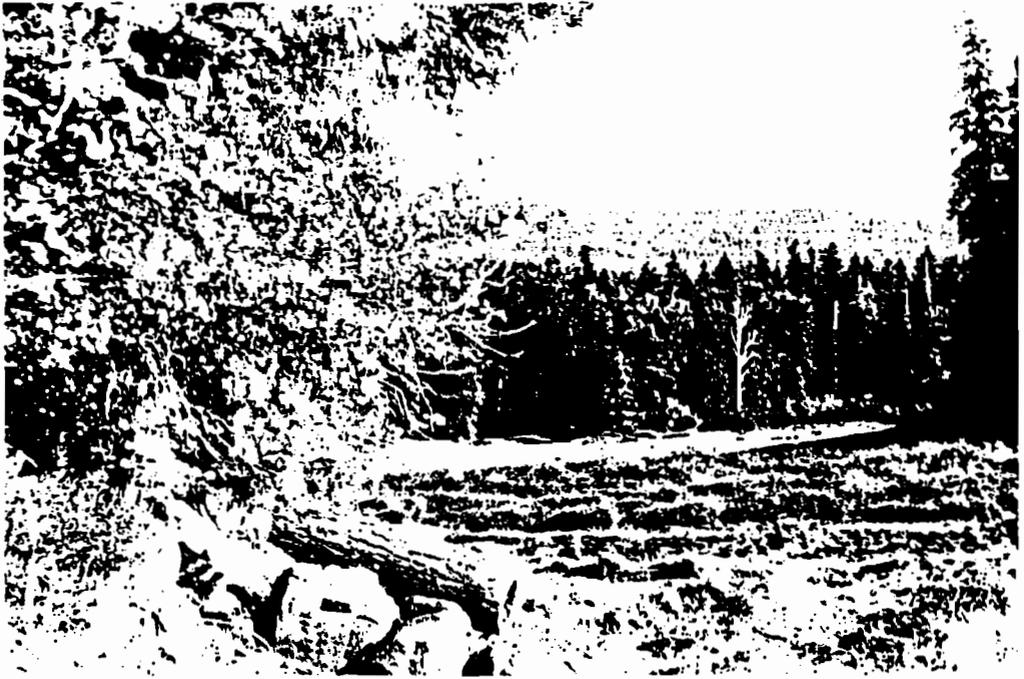
20

22

20 (126)

126





MT WASHINGTON FROM FISH LAKE



HISTORIC CABINS AT FISH LAKE





SAHALIE FALLS ON THE MCKENZIE RIVER



MCKENZIE RIVER
WILD AND SCENIC
STUDY RIVER





MT WASHINGTON VIEWED FROM SANTIAM PASS





BLACK CRATER





LAVA FORMATION

NEAR DEE WRIGHT OBSERVATORY

AT MCKENZIE PASS



The
DESCHUTES
National Forest



Willamette National Forest

U.S.D.A. Forest Service

Pacific Northwest Region



THREE SISTERS ACROSS LAVA FLOW

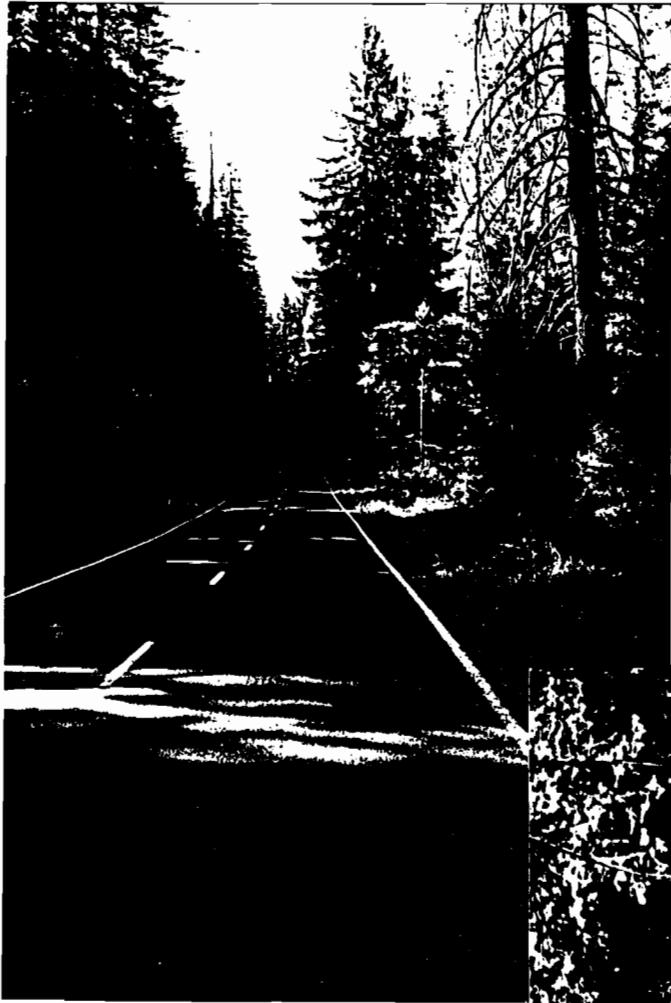
MCKENZIE PASS





KOOSAH FALLS ON THE MCKENZIE RIVER





**DOUGLAS FIR FOREST
NEAR WEST PORTAL**



PROXY FALLS





**HIGH PLATEAU MEADOW
SURROUNDED BY LODGEPOLE PINE**

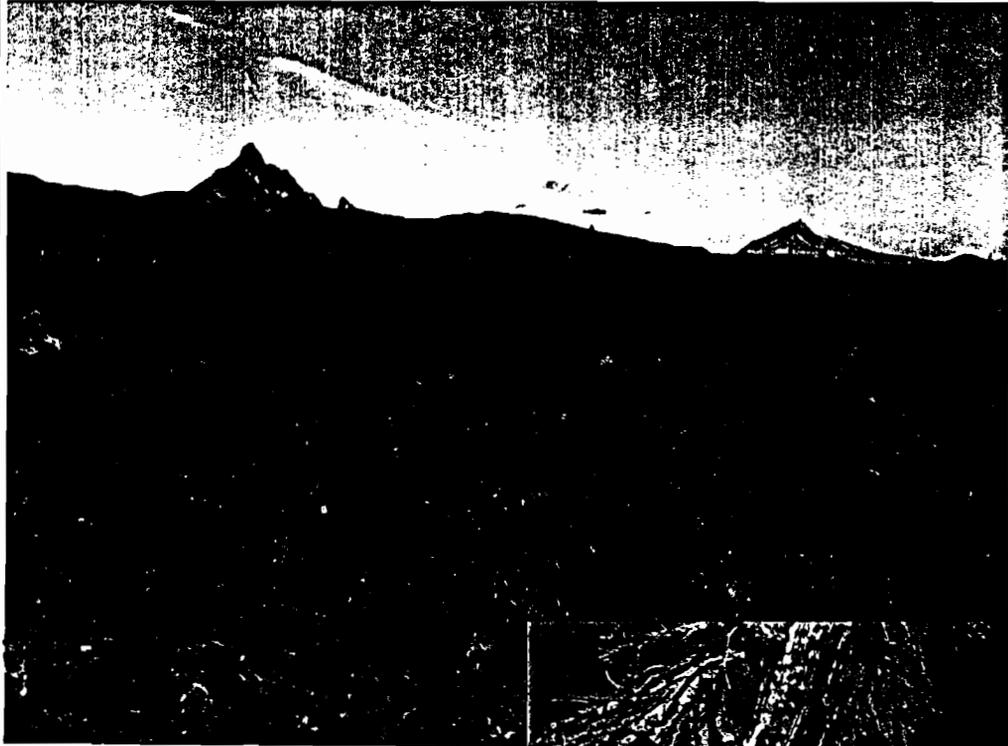




THREE SISTERS PEAKS VIEWED FROM SCOTT LAKE



MT WASHINGTON FROM BELKNAP LAVA FLOW



**MT WASHINGTON
FROM WINDY POINT
MCKENZIE PASS**



Willamette National Forest
U.S.D.A Forest Service Pacific Northwest Region



THREE FINGER JACK VIEWED FROM SANTIAM PASS



CROSS COUNTRY SKIERS IN SANTIAM PASS



Appendix B: Resource Narratives

GEOLOGY

Description

The Oregon Cascade Range, in the area of the Scenic Byway, is divided into two major geologic provinces: the Western Cascade Province and the High Cascade Province (Franklin and Dyrness, 1973). (See Figure B-1, Geologic Provinces and Bedrock Map.)

The geologically older Western Cascades are largely composed of 25-million-year-old to 45-million-year-old volcanic and pyroclastic formations. They are dominated by tuffs and breccias that weather relatively rapidly to deep, fine-textured soils and flows of basalt and andesite that weather slowly and have produced well-drained, coarse, stony soils. (Legard and Meyer, 1973). A long history of repeated glaciations and active stream erosion has produced the highly dissected topography evident in the area. Elevations of ridgetops are typically about 4,000 to 5,000 feet, with a few peaks nearing 5,700 feet.

The 13-million-year-old and younger High Cascades are adjacent to the older Western Cascades. These formations have built up from a chain of broad, coalescing shield volcanos (predominantly fluid lava flows), that cover the eroded eastern margin of the Western Cascades. They form gently sloping land, beginning at about 3,500 feet and rising up to a plateau near 5,000 feet.

Scattered along the crest within the Scenic Byway area are many small volcanic cones along with the well-known large composite volcanic peaks which rise another 1,500 to 5,300 feet above the surrounding terrain. Some of these peaks include the Three Sisters, Mt. Washington, and Mt. Jefferson. Soils of this province are usually immature and often developed in volcanic ejecta.

Glaciers have carved the higher elevation areas repeatedly, even as the mountains were forming. During the retreat of ice in the last glacial period, about 10,000 years ago, the topography was modified to include glacially carved rock headwalls, bowl-shaped cirque basins and their associated lakes, steep U-shaped canyons, and widespread deposits of glacial moraines and outwash materials. Distinct peaks that were highly modified by this glacial action include Mt. Washington and Three Fingered Jack. Present-day glacial activity is still occurring on the higher peaks of Mt. Jefferson and the Three Sisters.

Since deglaciation, several factors have acted to change the shape of the land's surface, both in the High and Western Cascades. Pumice from Mt. Mazama (Crater Lake), and deposits of ash, sand, and cinders from local cinder cones buried preexisting soils developed in glacial materials, and recent lava outpouring occurred in the McKenzie Pass and Santiam Junction areas (See Figure B-2, Surface Geology). In addition, large-scale downslope mass movements (landslides) have formed new lakes, altered drainages, and created numerous hummocky, uneven land forms, primarily in the Western Cascades.

Geologic processes influence many Forest management activities. The increasing demand for recreation, cost of road construction and maintenance, the control of fires, and the maintenance of clear, clean water supplies, as well as other management activities all require an understanding of the geologic environment and its implications for resource management.

For example, the cost in road construction, reconstruction, and maintenance are related to the distance required to haul aggregate to the site, excavation in steep or rocky slopes, slope stability and

steepness, difficulty of stream crossings, and the necessity for road structures. Rock for road surfacing and maintenance is considered a non-renewable resource and thus aggregate costs often influence road standards and operating seasons.

Recreation is also greatly influenced by geology and topography. Areas like Hoodoo Butte Ski Area rely on the slopes of the High Cascades for all types of wintertime activities. Local rock formations and the peaks of the North Sister and Mt. Washington provide technical climbing opportunities. The Dee Wright Observatory on the McKenzie Pass provides an inspiring view of the Cascade Range and recent lava flows. Unique formations such as Hogg Rock, Hayrick Butte, and Black Butte reflect nature's sculpturing, while rock cuts in the channel of the McKenzie River can provide white water recreation.

Interpretive Opportunities

Many areas of unique or special interest related to the geologic processes of volcanism and glaciation offer numerous opportunities for interpretation along the Byway route. These areas are discussed as they are encountered along the three highways of the Scenic Byway loop. Figure B-3 illustrates the location of each interpretive opportunity.

U.S. HIGHWAY 20 (SANTIAM PASS HIGHWAY)

From the intersection of State Highway 242 and U.S. Highway 20 in Sisters, U.S. Highway 20 proceeds northwest across the Santiam Pass to the intersection of U.S. Highway 22 and then west to the intersection of U.S. Highway 20 and State Highway 126.

1. Glacial Features:

From Sisters to Suttle Lake the route is generally across late-Pleistocene outwash sands and gravels over 20-feet thick derived from the glacial ice cap which covered much of the High Cascades. The outwash deposits overlay early-Pleistocene lava flows of the Deschutes Formation, which in some areas show through the glacial deposits.

From Suttle Lake to State Highway 126, any area that has not been covered by lava flows within the last 10,000 years will exhibit signs of glacial scour, or will contain deposits of unsorted lodgement or ablation till. A terminal moraine forms the dam behind which Suttle Lake is located. A lateral moraine may be seen near the intersection of U.S. Highway 20 and State Highway 22. Another lateral moraine occurs at the intersection of U.S. Highway 20 and State Highway 126, where recent lava flows from Nash Crater moved west against this deposit on the west side of the highway.

2. Lakes and Springs:

Due to disruption of drainage by the Green Ridge fault scarp, many springs occur in the Metolius Valley. The most famous is The Head of the Metolius.

Suttle Lake is situated behind a late-Pleistocene terminal moraine which represents the lowest elevation reached by an eastward extension of the ice sheet which accumulated between Mt. Washington and Three Finger Jack.

Blue Lake occupies a Holocene explosion crater surrounded by a rim of volcanic cinder ejected approximately 3,500 years ago.

Big Lake is situated 1 mile south of Hoodoo Butte and Hayrick Butte and occupies a glacially scoured valley.

Lost Lake was formed by lava flows associated with a north-south alignment of four basaltic cinder cones (Lost Lake group). The resulting ridge dammed Lost Creek approximately 2,000 years ago.

Lava Lake is located west of Little Nash Crater and was formed similarly and contemporaneously to Fish Lake and Clear Lake by a basalt flow from Nash Crater 3,800 years ago (which dammed Park Creek).

3. Volcanic Cones and Associated Lava Flows:

Black Butte is a composite cone constructed at the south end of the Green Ridge fault scarp. In spite of its youthful profile, Black Butte is older than many of the dissected High Cascade peaks.

Hoodoo Butte is a recent basaltic cinder cone with a summit crater. It was shielded from Pleistocene glaciation by Hayrick Butte, which stood as an elongate andesite dome in the path of the advancing ice.

Hayrick Butte is a mesa-like mass of basaltic andesite which also was overridden by the Pleistocene ice sheet.

Hogg Rock is a platy volcanic dome of very fine-grained andesite which was completely overridden by glacial ice. Hogg Rock was named for T. Egerton Hogg, who in 1888 built the grade for the Corvallis and Eastern Railroad which was to have connected Newport and Boise.

The Lost Lake Group of cinder cones erupted approximately 2,000 years ago and dammed Lost Creek to form Lost Lake. The cone north of the highway at Lost Lake and directly west of the entrance to the campground is 1,000 feet wide and contains a crater 300 feet deep.

Three Fingered Jack (elevation 7,841 feet) to the north, like Mt. Washington and the North Sister, is a heavily glaciated basaltic andesite composite cone and is estimated to have begun erupting between 700,000 and 200,000 years ago.

Maxwell Butte (elevation 6,229 feet) is located 3 miles southwest of Three Fingered Jack and is considered to be a broad basaltic andesite volcano which erupted between 80,000 and 40,000 years ago. Pleistocene glaciers scoured the upper flanks but did not extend to the west base of the mountain.

Little Nash Crater erupted between 3,500 and 3,800 years ago and is now quarried for the red cinders that are used on the highway in the winter. The quarried areas are littered with discarded volcanic bomb fragments up to 4 feet in diameter.

Sawyer's Ice Cave is a lava tube formed in a flow from Nash Crater. It is located approximately 2 miles northeast of Fish Lake. A lava tube is formed by a slightly viscous flow that cools quickly on the outer surface, yet allows the molten lava to continue flowing. This

eventually drains and leaves a hollow tube or tunnel. When the tube collapses, an entrance is formed by which access can be made. Sawyer's Ice Cave has a continuous cold breeze moving through it due to the difference in air pressure from the outside and inside of the tunnel. Other areas of lava tube formation can be found east of Fish Lake in the lava field of Nash Crater.

OREGON HIGHWAY 126

From the U.S. Highway 20 and State Highway 126 intersection, State Highway 126 follows the course of the McKenzie River, south from Clear Lake to the State Highway 242 Junction, roughly following the alignment of the heavily dissected Western Cascade escarpment to the west.

4. Glacial Features:

Glacial deposits are scarce along this section of the route. When seen they are found in several road cuts as deposits of unsorted cobbles and boulders of basalt and andesite usually contained in a matrix of oxidized yellow or reddish silty sand.

A glacial feature 1.3 miles north of the Kink Creek road is represented by a low-level topographic gap which was the ancient McKenzie valley. This gap carried the entire discharge of melt water from the sheet of late-Pleistocene ice between Mt. Washington and Scott Mountain.

5. Lakes and Springs:

Hackleman Creek was dammed by a lava flow from Sand Mountain approximately 3,800 years ago to form Fish Lake. The eastern shore of Fish Lake consists of younger basalt flows from Nash Crater. Fish Lake is normally dry during the summer due to the decreased rainfall and high porosity of the lake bottom. This was apparently not the case before the 1900s (indicating a climatic change).

Clear Lake is 1.5 miles long and more than 120 feet deep. It was formed 3,000 years ago by a volcanic eruption and lava flow from Sand Mountain, which dammed the McKenzie River. The lake is fed mainly by large springs along the north and east shores. Rising waters inundated a standing forest which is still rooted on the lake bottom. The lake floor is light colored due to the accumulation of diatomaceous mud. Diatoms are silica-secreting fresh water plants.

The result of these vesicular (porous) and blocky intra-canyon flows that covered the previously formed drainage channels is an upper McKenzie basin that is predominantly drained underground. Subsurface water discharges at large springs such as Big Spring, on the east side of Clear Lake, Great Spring on the north end, and Ice Cap Spring near Koosah Falls.

Hot Springs, the result of deep magma chambers heating underground water and forcing it to the surface along fault lines, occur at Belknap, Bigalow and Deer Creek along a north-south trend following the inferred location of the Western Cascade escarpment. The Belknap Hot Springs discharges water with a temperature of 188 degrees fahrenheit.

Trailbridge, Smith and Carmen are three hydroelectric generating reservoirs located along the route that were constructed during the early 1960s to link the McKenzie River and Smith River.

6. Water Falls:

Two thick flows of basaltic andesite lava (which dammed Clear Lake) from the Sand Mountain chain of cinder cones, moved into the McKenzie River canyon 3,000 years ago. The terminus of the first flow is marked by **Koosah Falls**. **Sahalie Falls** is located atop the terminus of the second flow .4 miles upstream.

A series of springs can be seen across the canyon at the base of Koosah Falls. This demonstrates the subsurface drainage network of the area. As a result of the energy of the water pouring over the falls, calving of the underlying blocks of weaker rock occurs in a cycle of headward erosion which has carved out an amphitheater into the lava margin.

Tamolitch Falls, 2 miles downstream from Koosah Falls, was formed approximately 1,500 years ago by a volcanic eruption and lava flow from Belknap Crater 10 miles to the east. Prior to the construction of the Carmen-Smith Hydroelectric diversion project, the waterfall plunged into a large spring-fed pool. Now, by late summer, the falls are nonexistent and the river at this point is a series of rock-bottom ponds and puddles as the underlying porous basalt and andesite drain away the surface flow. The Belknap flows also poured out in a double cascade down the cliffs of the McKenzie valley to the west of the crater, and spread out upon the floor of the canyon. A swampy area known as Beaver Marsh developed 2 miles upstream from Tamolitch Falls.

7. Volcanic Cones and Associated Lava Flows:

The predominant volcanic cones in the area are situated along the **Sand Mountain Alignment**, a north-south aligned group of volcanic vents. These are located in the north from Little Nash Crater to the central and south group of the Sand Mountain cones near Inaccessible Cone in the south. This alignment crosses into the Mt. Washington Wilderness and reaches a point on an imaginary east-west line that extends westward from Mt. Washington to State Highway 126 near Beaver Marsh south of Koosah Falls. This chain of volcanoes within the area comprise a total of 22 cones with 41 distinct vents.

The lava from the Sand Mountain Alignment generally flowed westward down the slope from Nash Crater and Sand Mountain, as well as the central and south group, with an accompanying discharge of ash and cinders. These eruptions are estimated to have occurred between 3,500 to 3,800 years ago. The last massive eruption of lava came from the South Group, Nash Crater, and Little Nash Crater to constitute the earlier Clear Lake Flow, Lava Lake, and Fish Lake flows. The last Clear Lake Flow of the massive lava eruption stage which dammed the McKenzie River occurred about 3,000 years ago from the south vent of Sand Mountain.

A replica of the original Sand Mountain Lookout at the summit of Sand Mountain (elevation 5,400 feet) has recently been constructed on the site of the original lookout which was destroyed by fire in 1968. This vantage point offers one of the best views of the upper McKenzie basin to the south and west.

The **Inaccessible Cone Alignment** began eruptions about 4,000 years ago on the glaciated High Cascades andesite platform.

The Trailbridge Ignimbrite, a distinctive Western Cascade basaltic andesite ignimbrite is located in the road cut adjacent to the Trailbridge Reservoir information display and parking area. (Note: an ignimbrite is a very hot pyroclastic flow that moves in part as a mobile gas-charged lava-foam or froth with nonstratified components and various rock inclusions.)

The outcrop is approximately 40 feet thick, cut by at least five faults, and is a very distinctive marker horizon that has been traced, without notable changes in feature, for 7 miles north and south along the Western Cascade foothills. One remarkable feature of this rock unit is the uncommon lithologies of the inclusions, which include gabbroic and dioritic porphyries. A bulk sample of the dense interior has been dated at 5 my.

Approximately 1/4 mile north of this site, on the east side of the road across from the powerhouse, the highway cut exposes several springs emerging from an aquifer on High Cascade pillow basalt.

STATE HIGHWAY 242 (MCKENZIE PASS HIGHWAY)

Approximately 3 miles east of the community of McKenzie Bridge, State Highway 126 intersects State Highway 242. This intersection is near the approximate boundary of the Western and High Cascade physiographic provinces. It is also near the point at which the McKenzie River changes course. The direction goes from north-south to east-west (breaching the western escarpment of the High Cascade Graben), and at the confluence of Lost Creek and the McKenzie River.

8. Glacial Features:

The roadcuts at this intersection were excavated through a terminal moraine placed there by a late Pleistocene glacier that moved down Lost Creek to confluence with the ice mass in the main McKenzie valley. Rounded and sub-rounded boulders of andesite and rhyolitic obsidian from the Middle Sister can be observed in this moraine deposit.

The Lost Creek Valley is generally traversed by State Highway 242 southeast for 3 miles and then east and northeast to the Sims Butte/Frog Camp area for another 9 miles. Lost Creek is so named because it and several of its tributaries disappear beneath the underlying basalt lava flows from Sims Butte and Collier Cone and continue by migrating through the old stream gravel buried beneath.

The source of Lost Creek is a cluster of springs, which emerge from under the basalt flows, located about 3 miles southeast of the confluence with the McKenzie River. These springs are fed by White Branch, which begins its course below Collier Glacier on the North Sister. Because much of the water in this valley flows underground, a large portion of White Branch is not visible at the surface for most of the year.

During the Pleistocene era glacial ice originating near the North and Middle Sisters moved down the valley in at least six episodes. The steep walls, which are composed of up to 1,500 feet of early High Cascade basalt flows that have been dated at 3.9 my bp, and the U-shaped cross section of the Lost Creek trough where it has not been affected by recent volcanism, are characteristic of glacial valleys.

More than 7,000 years ago a volcanic eruption at Sims Butte produced flows of basalt lava down the Lost Creek trough in thin sheets to within one-fourth mile of Limberlost Campground. A later eruption at Collier Cone, 1,600 years ago, sent another lobe of lava into the Lost Creek trough. Flows from this cone, located at the base of the North Sister, extended down the valley to approximately one-half mile beyond Lower Proxy Falls, partially covering the Sims Butte flows.

State Highway 242 passes through terminal moraines approximately 7 miles west of Sisters and then crosses areas covered by glacial outwash.

9. **Lakes and Springs:**

State Highway 242 offers access on either side to many high lakes. The processes that formed these lakes include glacial scour, morainal deposits, and lava damming. **Linton Lake** and **Spring Lake** are both impounded by the Collier Cone lava flows. Neither of these lakes have surface outlets, rather they drain into the underlying porous lava. Linton Lake is located just southeast of Alder Springs Campground. Spring Lake is located at the base of Sims Butte.

Scott Lake and **Melakwa Lake** are two of many lakes located in Lake Valley, an area of low relief between Sims Butte and Hand Lake that is associated with glacial scour and lava damming. **Hand Lake** is dammed by lava from Twin Craters. Fragments of gray obsidian, which were transported by glacial activity from a small plug dome 2 miles east, are abundant in the surficial deposits of the area.

Lava Camp Lake occupies a small glacial basin east of the Dee Wright Observatory.

Cold Spring issues from the margin of a lava flow.

10. **Water Falls:**

At the head of Lost Creek Canyon, Linton Creek pours over a series of Husband volcanic lava flows which produced **Linton Falls**. This is the largest and most spectacular waterfall in the Three Sisters area and empties into Linton Lake.

Proxy Falls is located approximately 1.5 miles west of Linton Falls. There are two main falls, **Upper Proxy Falls** and **Lower Proxy Falls**. The two main falls are different both in form and in origin. Water for **Upper Proxy Falls** originates in a large group of small springs that emerge from inner beds between lava flows about 600 feet above the valley floor. At the bottom of the falls, the water flows into a nearly circular basin from which there is no outlet. Without noticeable eddy motion or an apparent opening in the bottom of the basin, the water percolates into the lava flow and enters the subsurface drainage system.

The water for **Lower Proxy Falls** is supplied by Proxy Creek and its tributary Shadow Creek. The water enters the glacial trough through a hanging valley left perched high above the valley floor as a result of glacial scour. In the last 200 feet of its fall toward the valley floor, the stream rushes over a steep, bulging rock surface and then plunges into free fall near the bottom.

11. Volcanic Cones and Associated Lava Flows:

The **Two Butte** cinder cone is in closest proximity to State Highway 242. It is located approximately 1 mile northwest of Alder Springs Campground, but is reached from State Highway 126. It contains a short flow of basalt which descends the steep glaciated side of the valley for only a short distance. **Scott Mountain** is a glaciated High Cascade shield volcano composed of gray, fine-grained basalt capped by a small, much eroded cinder cone.

The eruptions from **Sims Butte** (more than 7,000 years ago) and **Collier Cone** (1,600 years ago) flowed down Lost Creek Valley.

Yapoah Cone and **Four-in-One Cone** erupted approximately 2,000 and 2,700 years ago, respectively, and are part of a north-south alignment of 19 vents. The Yapoah flows poured nearly 5 miles down the eastern slope of the Cascades following the valley of a small stream. East of the McKenzie Pass, State Highway 242 follows its southern edge down into regions of older rocks.

Belknap, Little Belknap, South Belknap, and Twin Craters are a focal point of nested summit cones with a long and complex episode of Holocene (recent) basalt and basaltic andesite volcanism. The broad shield of the Belknap complex is 5 miles in diameter, with an estimated thickness of 1,700 feet and is 1.3 cubic miles in volume. Basaltic andesite issued from vents at the north and south bases of the cone approximately 1,500 years ago. The exception is Little Belknap which erupted earlier at 2,900 years bp. Lava poured 12 miles to the west and ash was ejected from the northernmost of the two summit craters. The main bulk of the Belknap ash, which has been traced over an area exceeding 100 square miles, was ejected earlier from a larger south crater. Still earlier lavas were basaltic and moved eastward 7 miles from their vents.

The **Dee Wright Observatory** is located at the summit of State Highway 242 (McKenzie Pass) at the boundary between the Willamette National Forest and Deschutes National Forest. The building is constructed on a lava flow which erupted from Yapoah Cone 3 miles southeast of the highway 2,600 to 2,900 years ago. The lava flow overlaps an earlier flow from the Little Belknap Crater. The observatory offers a panoramic vista of the McKenzie Lava Field and the volcanic cones which produced it.

The **North Sister** (elevation 10,085 feet) is a glacially dissected remnant of a large summit cone which was built upon a broad shield volcano of early High Cascade andesite. The composite cone is composed of thin flows and a central plug of uniform basaltic andesite.

The **Middle Sister** (elevation 10,045 feet) and **South Sister** (elevation 10,358 feet) were active during the Pleistocene, and, therefore, were not as extensively eroded. They do not rest on shield volcanoes and are not homogeneous in composition. They contain over 26 different types of igneous rock including rhyolites, andesites, basalts, obsidian, and tuffs. Eruptions of silicic lavas have occurred on the flanks of South Sister as recently as 2,300 to 1,900 years bp.

Mt. Washington (elevation 7,794 feet) presently is what remains of a large, symmetrical Plio-Pleistocene andesite composite cone built on top of a previously erupted shield volcano of basalt and basaltic andesite. Erosion by streams and by glaciers which etched cirques back into the peak have destroyed the superstructure of the volcano and exposed the feeding plug of intrusive rock.

..

Black Crater is a late Pleistocene basaltic andesite volcano. The "crater" is actually a glacial cirque open to the northwest.

Fourmile Butte is one of 10 late Pleistocene cinder cones between Black Crater and Black Butte. So many lava flows issued from these cones that a lava field now covers approximately 25 square miles.

Sources of Additional Information

Geologic History, origin, and Process for The McKenzie - Santiam Pass National Forest Scenic Byway; Compiled by Robert A. Jensen, Deschutes National Forest and Michael T. Long, Willamette National Forest, April 1991.

Land and Resource Management Plan and Environmental Impact Statement, Deschutes National Forest, Bend, Oregon, 1990.

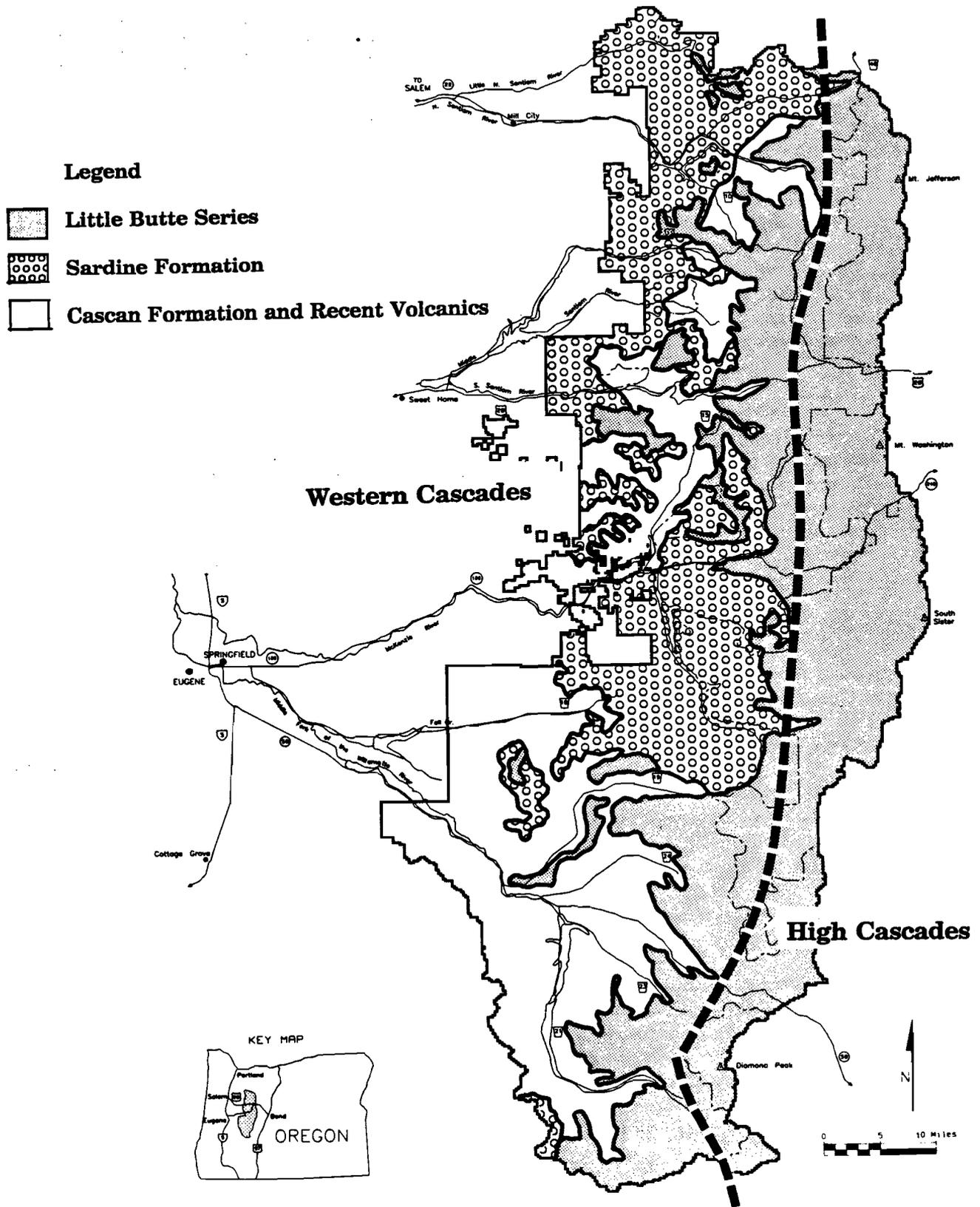
Land and Resource Management Plan and Environmental Impact Statement, Willamette National Forest, Eugene, Oregon, 1990.

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FIGURE - B-1

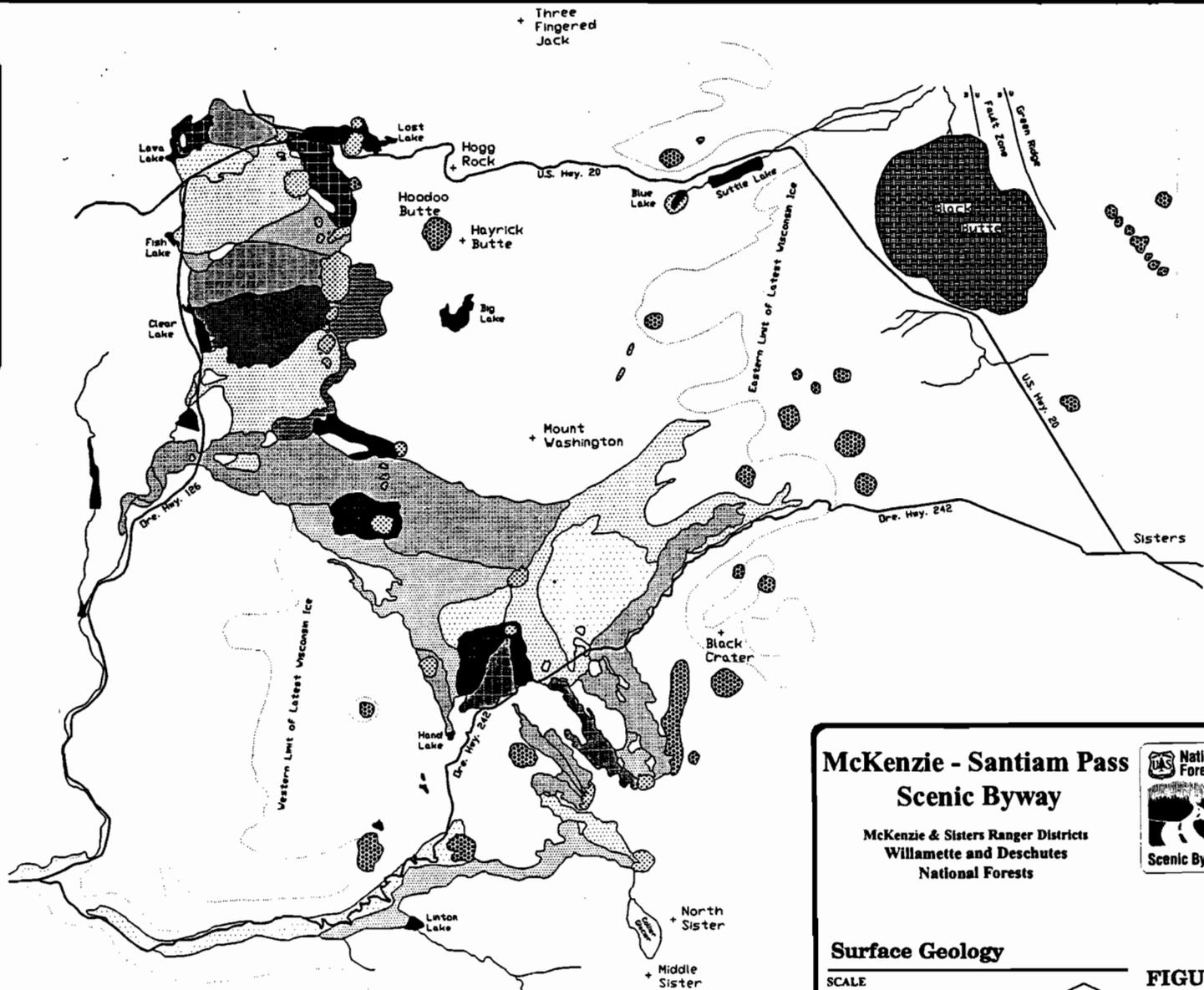
Geologic Provinces and Bedrock

Willamette National Forest



LEGEND

-  Flows in the Belknap
- Sand Mt. Field
-  Post-Mazama Cinder Cones
-  Pre-Mazama Cinder Cones
-  Black Butte
-  Limit of Latest Wisconsin Ice

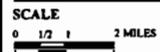


**McKenzie - Santiam Pass
Scenic Byway**

McKenzie & Sisters Ranger Districts
Willamette and Deschutes
National Forests



Surface Geology

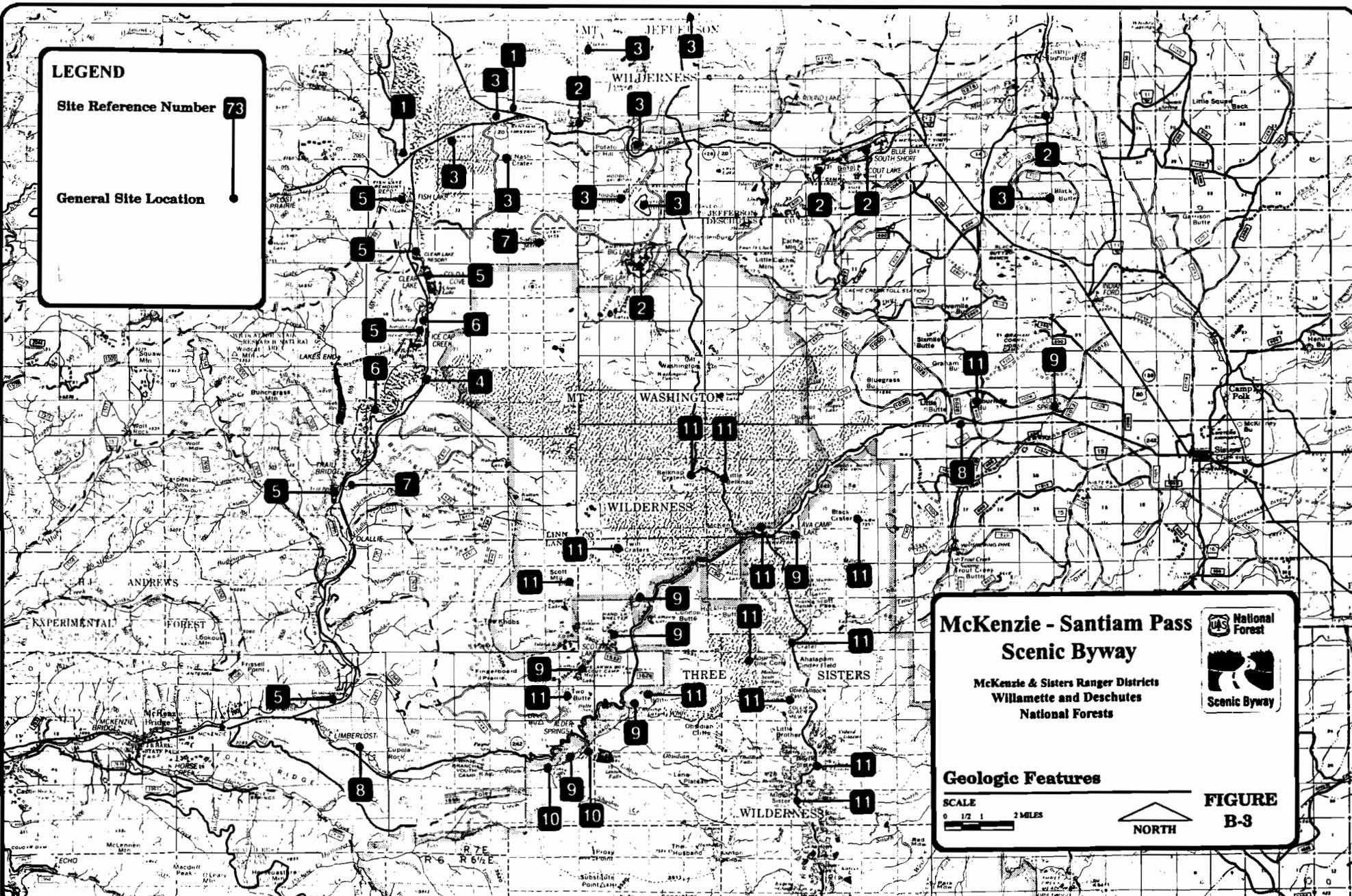


**FIGURE
B-2**

LEGEND

Site Reference Number **73**

General Site Location

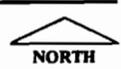


**McKenzie - Santiam Pass
Scenic Byway**

McKenzie & Sisters Ranger Districts
Willamette and Deschutes
National Forests



Geologic Features



**FIGURE
B-3**

CLIMATE

Description

Many aspects of the Scenic Byway are influenced by the weather. The winter and early spring seasons supply snow for downhill and cross country skiing, snowshoeing, and snowmobile use. Melting snow brings the water for municipal use and hydro-electric generation, as well as white water recreation and fish migration. Often, when fog persists in the Willamette Valley during the winter months, this area of the Cascade Mountains is sunny. These sunny periods are an invitation to escape from the fog, go sightseeing, or enjoy snow-related activities. In the dry summer season, many people again come to the Byway area to seek relief from the heat and to enjoy the scenic beauty of the area.

Climate has played an indispensable role in the development of the Forest environment of the McKenzie Pass - Santiam Pass National Scenic Byway. The climate of this area is referred to as Pacific Maritime. It is influenced by several factors. These factors include the position and intensity of upper level wind currents, the high and low pressure systems over the North Pacific Ocean, and variations in topography. In the summer, high pressure brings fair and mild weather to the area. As winter sets in, high pressure systems move to the south, allowing winter storms to move across this area of the two Forests. These frontal systems bring mild rainy conditions to lower elevations of the Byway and heavy snows generally above 4,000 feet elevation (Sterns and Gilbert, 1960).

The heaviest precipitation lasts for about three months starting in December. It accounts for 40 to 60 percent of the yearly total. Mean average temperatures range from 30 to 40 degrees in January and average in the 60 degree range in August on the west side of the Cascade Range (Legard and Meyer, 1973). On the East side of the Cascade Range winter temperatures average between 20 and 30 degrees F. In summer, the area averages about ten days with temperatures above 90 degrees F. This area also receives the least amount of precipitation between June and October, when temperatures are highest. Thunderstorms occur most often during these months.

Moisture has been one of the primary climatic factors affecting vegetative growth in the area. The western portion of the Byway has relatively dry, cool summers and mild, wet winters. These conditions are particularly favorable to evergreen conifers (Waring and Franklin, 1979). The eastern portion of the Byway on the Deschutes National Forest has warm, dry summers and mild winters. This supports spectacular stands of Ponderosa Pine mixed with pockets of lodgepole pine.

The vegetative patterns of the Forest are strongly influenced by both climatic and topographic conditions. As the elevation increases, the climate becomes more severe. As a result, species composition and size of individual species decreases in the higher elevations. Thorough accounts of vegetation zones and plant communities on the Forest are in publications by Franklin and Dyrness (1973), Franklin (1979), Hemstrom et al. (1982, 1985).

Site-specific microclimatic conditions are an important aspect of the Forest environment and are a major influence on plant and animal habitat. While meadows, rocky areas, and harvest unit sites are often exposed to the weather, riparian zones along creeks and lakes provide shade, lower temperatures, increased humidity, and in general, a more protected environment.

Climate has also played an important role in development of soils of the Scenic Byway area. The weathering, decomposition, sedimentation, and overall mineralization caused by ice, snow, rain,

wind, sun, cold, and heat are directly related to the breakdown of bedrock to form the many types of soils present in the area.

When climatic conditions are warm and dry, periodic thunder and lightning storms can result in the ignition of wildfires. However, strong east winds often present a more critical fire danger. During the summer and fall seasons, these dry, warm winds reach between 30 to 40 miles per hour with stronger gusts over the higher ridges. During these periods, small smoldering embers can quickly ignite large fires, thus requiring major fire suppression efforts. As a consequence, industrial operations are restricted and prescribed burning activities are curtailed. In extreme cases the Forest is closed to all uses until rain or humidity lowers the fire danger.

Weather patterns also influence the distribution of smoke and, hence, air quality of the Scenic Byway environment and surrounding communities. Maritime winds provide good mixing and dispersion of smoke into the upper atmosphere and away from smoke sensitive areas and local communities. It is common to have completely different atmospheric conditions in the western valleys as compared to the crest area of the Scenic Byway and the high desert of eastern Oregon.

Interpretive Opportunities

A discussion of climatic affects and relationships could be incorporated into the interpretive messages of other topics, such as geology, vegetation, soil, and water.

Sources of Additional Information

Land and Resource Management Plan and Environmental Impact Statement, Willamette National Forest, Eugene, Oregon, 1990.

Land and Resource Management Plan and Environmental Impact Statement, Deschutes National Forest, Bend, Oregon, 1990.

SOIL

Description

Soil, a fundamental component of the environment, is the growing medium for most plants. Soil absorbs and stores water, releasing it slowly over time. It supplies nutrients for vegetation, which in turn supplies habitat for wildlife and other resources. All renewable surface resources within the Scenic Byway are dependent upon soil. Soil is considered a non-renewable resource because of the length of time required for its formation.

Soils present within the area of the Scenic Byway area are diverse, reflecting the influence of climate, time, vegetation, parent material, and topography. Parent material of this area's soil is almost entirely of volcanic origin and can be divided into two broad classes: 1) hard volcanic rocks, such as basalts, andesites, and intrusions of various kinds; and 2) soft volcanic rocks, such as breccias, tuffs, and volcanic ejecta.

Soils with parent materials consisting of hard volcanic rocks may develop at a rate of approximately one inch per thousand years, while soils with parent materials consisting of soft volcanic rocks may develop at much faster rates. Soils can also form on materials derived from other geologic materials and include deposits of glacial outwash and till, alluvium, loess, colluvium, and sediments.

Geologically recent volcanic ejecta (pumice, ash, sand, and cinders) have had a major influence on soil formation in this area of the High Cascades region of Oregon. These rock types are generally found at elevations in excess of 4,000 feet, but may occur at elevations as low as 3,000 feet. Because of the short, dry, growing season and high snow pack in portions of the area, vegetative growth and microbial activity are restricted. This makes soil formation much slower than in the more temperate lower elevations to the west of the Scenic Byway route. These soils are generally not as well developed, or as fertile as those occurring in the Western Cascades.

Inventories of the soils of the Willamette National Forest and Deschutes National Forest were completed and published by Legard and Meyer in 1973 and Larsen in 1976, respectively. These inventories, referred to as Soil Resource Inventories (SRI), display areas of similar soil, parent material, land form, and vegetation as soil-landtype units that form the basis for interpretations provided in the inventory reports. The purpose of the SRI report is to provide soils information to help guide a wide range of Forest management activities and to assist in the maintenance of soil stability, fertility, and productivity.

Interpretive Opportunities

Several opportunities for interpretation of the area's unusual soil types have been identified in the Santiam Pass area. These interpretive opportunities are listed below and their locations are identified in Figure B-4.

1. Black volcanic sands and cinders in road cut at the maximum angle of repose.
2. Little Nash Crater, site of "red cinders" used for winter road sanding.
3. Hoodoo Ski Area, built on a cinder cone of black sands and cinders.

4. Natural sand deflation basins or blowout areas.
5. Nash Crater and Sand Mt. are cinder cones.
6. Very productive volcanic ash soils from Mt. Mazama overlaying glacial till.
7. Newly forming soils on recent lava soils. This area supports trees but is so rocky it can't be planted.

Sources of Additional Information

Land and Resource Management Plan and Environmental Impact Statement, Willamette National Forest, Eugene, Oregon 1990.

Land and Resource Management Plan and Environmental Impact Statement, Deschutes National Forest, Bend, Oregon 1990.

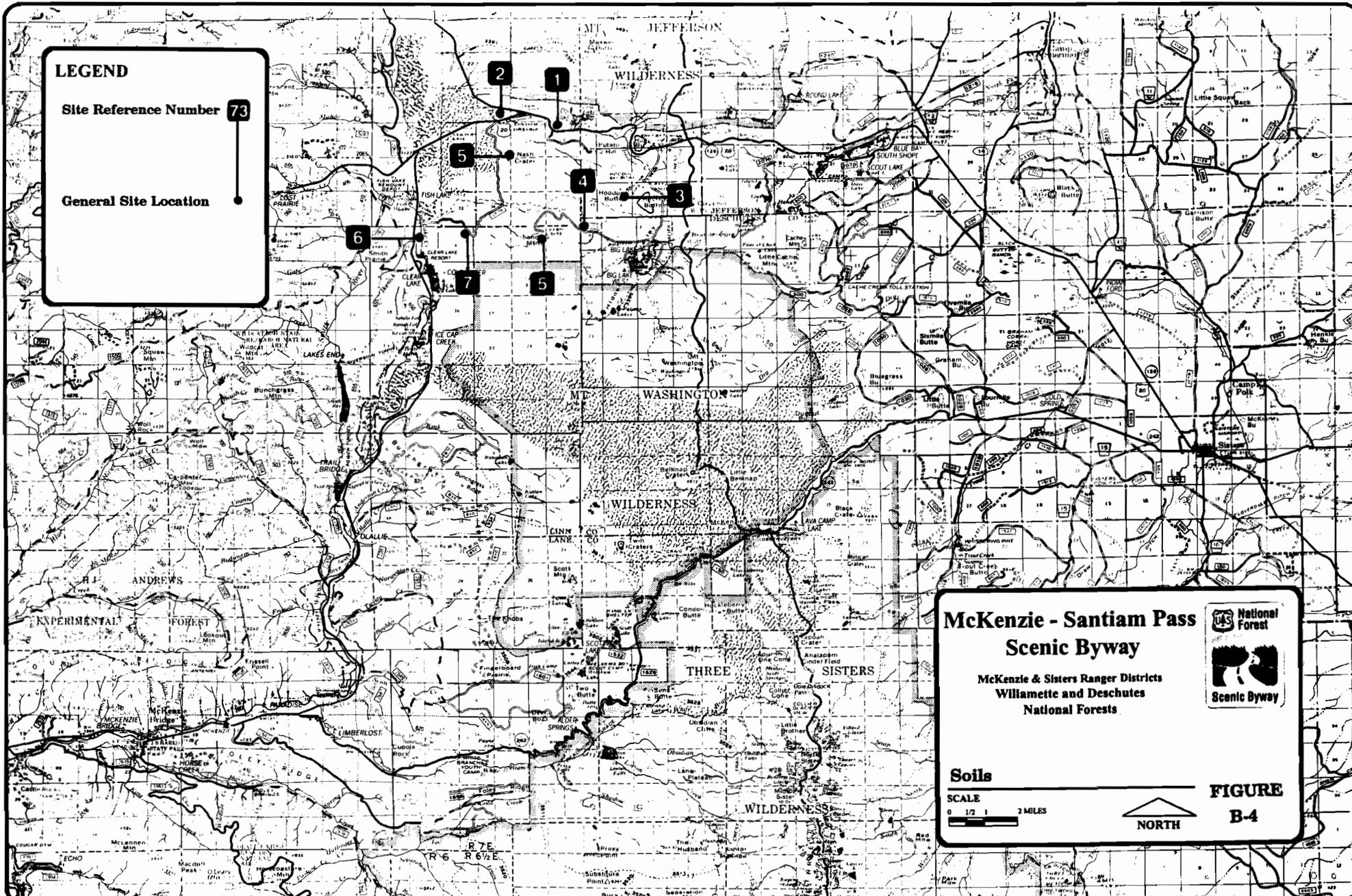
Legard, H.A and Meyer, L.C. Soil Resource Inventory (SRI) of the Willamette National Forest. USDA Forest Service, Eugene, Oregon, 1973.

Larsen, Daniel M. Soil Resource Inventory (SRI) of the Deschutes National Forest. USDA Forest Service, Bend, Oregon, 1976.

LEGEND

Site Reference Number **73**

General Site Location



**McKenzie - Santiam Pass
Scenic Byway**

McKenzie & Sisters Ranger Districts
Willamette and Deschutes
National Forests



Soils

SCALE

0 1/2 1 2 MILES



FIGURE

B-4

WATER

Description

The Scenic Byway area is a source of high-quality water that is furnished by the Willamette National Forest for municipal and domestic uses, fish hatcheries, electrical power generation, livestock, agriculture, and recreation. The two basic forms of water in the area are surface water, (streams, rivers, lakes, and reservoirs) and subsurface or groundwater.

Streamflow from the Byway forms the headwaters of the McKenzie River. Numerous creeks on the Willamette National Forest and Deschutes National Forest reflect the precipitation regime of the Pacific Northwest. Streamflow on the Deschutes National Forest portion of the Byway generally originates from deep-seated springs. As such, streamflow is very stable and is not subject to frequent flooding.

A good example of this is the Metolius River, which rises from a series of spring vents near Black Butte. The Metolius is one of the largest spring-driven streams in the United States. Such streams are not subject to the wide fluctuation of annual flow common in the western United States. Flooding occurs only under extreme circumstances, such as from rapid snow melt on frozen ground.

Water yield, or volume of runoff from the Byway area, is the result of the balance between precipitation and physical characteristics of the landscape. The type, amount, distribution, and timing of precipitation, as well as land form, vegetative cover and soil type influence both timing and volume of runoff. Approximately 85 percent of the area's annual runoff occurs between November 1 and March 31. Current demand for water during the remainder of the year is being met with only 15 percent of the annual water yield, including low-flow periods when streamflow is greatly reduced from average winter flows.

It is believed that this area of the High Cascades mountains contributes to recharge areas for aquifers in the Willamette Valley and for portions of Eastern Oregon immediately adjacent to the Cascades. A large portion of the precipitation which falls above 4,000 feet in elevation falls as snow. Given the volcanic nature of this area and its largely porous rock formations, the melting snowpack during spring and summer months significantly influences the seasonal volume of runoff and groundwater recharge to the east and west.

Water from the area provides for fish and wildlife habitat, and supports a highly productive vegetative environment. Streams within the Byway area provide high-quality water and the physical environment necessary for both anadromous and resident fish spawning and rearing. There are many natural lakes within the area that are easily accessible from the Byway route. The majority of natural lakes located within the area are above 3,000 feet in elevation. While these lakes vary widely in size and productivity, trout are found in most lakes over 2 acres in size and 8 to 12 feet in depth (Skeesick and Jones, 1988).

Water use potential is contingent upon water supply availability, development of water structures, and changes in the distribution of demand sources. Water supply from this area of the Forest is expected to exceed demand well into the future.

Currently there is one hydroelectric facility within the Scenic Byway corridor operated by Eugene Water and Electric Board (EWEB). EWEB operates a hydroelectric generating system in the upper McKenzie River basin at Carmen, Smith, and Trailbridge Dams. The Willamette National Forest

supplies 100 percent of the water used to operate this facility. The capacity of the EWEB facility generates sufficient power to meet the needs of thousands of households each year.

Recreation use of the surface waters in the Byway is expected to increase by 10 to 25 percent. As a result, a shift in the distribution of recreation experience types could occur because of an increase in the density of recreation users. The importance of the McKenzie River as an asset for recreation, fish and wildlife habitat, and its scenic value is underscored by its designation as a National Wild and Scenic River.

Much of the attraction of the McKenzie Pass - Santiam Pass National Scenic Byway on the west side of the Cascade Range is created by the clear water of the McKenzie River and its tributaries. Highway 126 parallels the McKenzie River for most of its length, and Highway 242 parallels White Branch Creek for 7 miles. The McKenzie River's high-quality water makes it one of Oregon's most significant rivers, recognized for its value in recreational boating, sport and commercial fisheries, for domestic and industrial use in the City of Eugene, and for hydroelectric production.

On the Eastern portion of the Scenic Byway, in the Deschutes National Forest, numerous lakes and small streams are the focus of many recreational activities, and provide a welcomed relief from the hot dry summers of Eastern Oregon.

Protection of water quality and quantity on both Forests is required by the laws which created the National Forests, by the Clean Water Act, the Federal Water Pollution Control Act (FWPCA) and amendments, and most recently by the National Forest Management Act. In addition, many Federal and State laws regulate the establishment and existence of water rights on National Forest land.

Interpretive Opportunities

Water resources within the McKenzie Pass - Santiam Pass National Scenic Byway offer many opportunities for the public to gain an awareness about the quantity, quality and uses of water from this area, an understanding of their own levels of water consumption. Several interpretive opportunities are listed below and their corresponding locations are illustrated in Figure B-5.

1. LOST CREEK - Loop trail

Information - Influence of spring water on the McKenzie.

Lost Creek Springs is one of the best examples of the natural springs which feed the McKenzie River. These areas have fragile streambanks, and use should be controlled by trails and railings.

Lost Creek Springs is actually two springs that feed cold clear water to Lost Creek. The temperature and quality of the water fluctuates very little throughout the year because of the filtering and shading provided by the geology of the area. Evidence of the filtering action of lava is apparent at several locations on the loop trail.

2. BELKNAP HOT SPRINGS

Geothermal Resource Information - This site, in addition to being of historic interest in the area, is also a potential source of geothermal energy. Of particular interest is its variation in water chemistry as compared with water from surrounding areas.

3. ROADSIDE RIVER VIEW

Information - General overview of uses and flow levels. The McKenzie River provides important aquatic habitat, domestic water, and recreation opportunities. Flow levels here are controlled by the upstream hydroelectric project which approximates natural flows (near Forest Road 2650 or 2654) (Information).

4. TRAILBRIDGE RESERVOIR

Information - Outputs supplied by Carmen-Smith project and its design. Includes a general map of Carmen-Smith Reservoir system and a self-guided side-tour to Smith Reservoir.

Power House - The two turbines at the Carmen Power Plant have a maximum generating capacity of 80,000 kilowatts. A discussion of this facility should address the important statistics of demand, daily production, and water useage.

Trailbridge Reservoir is a re-regulating reservoir, designed to release water to the river below at approximately the same rates as would occur naturally.

5. CARMEN DIVERSION DAM

Information - Function of reservoir in Carmen-Smith project. Water in this reservoir is diverted through a tunnel 9.5 feet in diameter to Smith Reservoir, 2.2 miles away and 20 feet lower. This diversion causes the 3.5 miles of original river channel below to be dry for much of the year. This diversion increases the production capacity of the EWEB project by ** kilowatts.

6. KOOSAH - SAHALIE FALLS

A series of waterfalls and whitewater rapids of outstanding scenic quality within the designated McKenzie Wild and Scenic River. This area offers excellent opportunities for interpretation of the area's natural history and to provide a diverse range of recreation activities and experiences.

7. FISH LAKE

Information - Characteristics of a non-lava watershed. Interpretation would discuss the amount of water flowing from Hackleman Creek into Fish Lake throughout the winter and spring and how this is affected when snow in the above surrounding watershed has melted. During May the stream is small enough that it flows through lava tubes to Clear Lake, and the water level in Fish Lake drops, resulting in a summer meadow.

8. MEADOWS AND PONDS

Scenic views of a series of wetlands along Highway 20. This area should be described in brochures and audio tape tours of the Byway. Access to the area should be discouraged due to the sensitive nature of this wetland habitat.

9. BLUE LAKE

Formed from a volcanic explosion, Blue Lake is 314 feet deep. A campground and related facilities are provided, including fish cleaning stations.

Development Potential: A pull-out on Highway 20 could be developed to provide a view of Blue Lake. Development plans should include an interpretive sign describing the geologic history of the lake and a diagram of landscape features being viewed.

10. SUTTLE LAKE

A glacial moraine formed this lake which presently supports a fishery of kokanee salmon and rainbow and brown trout. At one time this lake also contained sockeye salmon and bull trout.

Development Potential: Possibly a view point located on Highway 20 to compliment the existing interpretive signing situated at the campground below. It is also possible that this pull-out could share the same location as the one for Blue Lake.

11. METOLIUS SPRINGS

The headwaters of the Metolius River lies approximately 4-1/2 miles north of the Byway, at the base of Black Butte. The background setting of Mt. Jefferson and the gigantic springs flowing through meadows is a favorite photographic point. The Forest Service maintains and protects the site, viewpoint area, and trail by way of a gift and scenic easement established in 1967 by Mr. and Mrs. Samuel S. Johnson.

The Metolius Basin was created through faulting and downwarping, and water flowing through subterranean channels became trapped. This water comes to the surface at the Metolius Springs, feeds the Metolius River, and flows to Lake Billy Chinook.

The river's name, Metolius, came from the Indians who first used the Basin area. Two meanings have been given; "white fish" by the Warm Springs Indians (referring to light-colored salmon), and "spawning salmon" by others.

Interpretive signing that covers the origin of the Spring already exists at the parking lot. This sign needs to be replaced, possibly with new graphics and text. The Forest Service would also like to create an arboretum along the trail leading from the parking lot to the Spring.

A fairly new, and accessible, rest room facility exists at the parking lot, along with picnic tables and garbage pickup. These facilities are adequate and in good condition.

The actual viewpoint site is maintained through coordination with the Johnson family. This is an on-going process which entails managing the vegetation so as not to obscure the view, and maintaining the railing and signs along the path.

As agreed to in the Deschutes National Forest Land and Resource Management Plan, any proposed activities, as well as information included in any interpretive material, (i.e. signs, brochures, audio tapes, etc.) would not be developed without previous coordination with the Metolius "community".

12. BLACK BUTTE SWAMP

This is a wetland in the upper portion of the Indian Ford Creek drainage with a view of Black Crater in the background. Aspen, willow, and sedges provide interest and diversity to the view and habitat for many animals.

Development Potential: Interpretation of scenic resource enhancement through brochures or audio tape tours. This site does not lend itself to a pull-out situation as it is located on a curve of heavily traveled Highway 20.

13. INDIAN FORD CREEK

This creek provides riparian habitat important to herons and beaver living along the creek. This site is also of some historical significance as a stream crossing by early pioneers.

Development Potential: Some historical signing exists. However, further interpretive signing could be provided to enhance the experience of Indian Ford Campground visitors.

14. COLD SPRINGS

Cold Springs is actually an intermittently flowing spring that provides moisture to a wide riparian area. Cold Springs flows in the late spring and summer when most small springs in the area are dry. It is dry the remainder of the year. The source of this spring is either a subsurface pool that collects and then leaks water to the surface, or it lies at a substantial distance from the spring opening and collected water just takes that long to reach it.

There is an existing dirt path to the spring from the parking lot. The trail could be improved and included in an accessible loop trail through the aspen grove (Also see Recreation for this site).

Sources of Additional Information

Land and Resource Management Plan and Environmental Impact Statement, Willamette National Forest, Eugene, Oregon, 1990.

Land and Resource Management Plan and Environmental Impact Statement, Deschutes National Forest, Bend, Oregon, 1990.

Visibility is monitored on a continuing basis in a cooperative effort by the DEQ, National Park Service, and the Forest Service. It is measured by atmospheric discoloration and change in visual range. Instruments located on Black Butte and near Big Lake monitor visibility for the Mt. Jefferson Wilderness, Mt. Washington Wilderness, and the Three Sisters Wilderness. Data from this monitoring program indicated that prescribed burning is a significant contributor to visibility impairment.

As a control strategy the Oregon State Implementation Plan imposes a prohibition on prescribed burning in the Central Oregon Cascades from Lane County north, except under specified conditions, from July 4 through Labor Day. The Forest has implemented a policy of no prescribed burning during this period without the prior approval of the Forest Supervisor. This prevents significant deterioration of the airshed during the heavy use period along the Byway and in mandatory Class I areas.

Monitoring of wilderness areas indicated that the visual range is quite good. Median summer ranges of visibility were from 97 to 107 miles, with 109 to 118 miles in the fall (1989 Visibility Monitoring and Data Analysis Report). The Three Sisters Wilderness and the Mt. Washington Wilderness showed a median visual range of 81 to 89 miles in summer and 100 to 107 miles in the fall. The Mt. Jefferson Wilderness showed a median visual range of 81 to 87 miles in the summer. No data was taken for the fall. Monitoring of visibility in the wilderness areas will continue to ensure that visibility does not deteriorate.

In the near future, visibility within the Byway will improve by implementation of current regulations and as regulatory smoke management requirements become more strict.

Interpretive Opportunities

The quality of the air within the Scenic Byway is readily apparent to most visitors and is an important aspect of the user's overall recreation experience. The two monitoring stations located within the Byway offer an ideal opportunity to describe air quality monitoring standards and processes and to interpret air quality of the Scenic Byway. Interpretive opportunities are listed below and are illustrated in Figure B-6.

1. **Dee Wright Observatory:** Air quality management and description and display of methods being used to manage and maintain air quality and air quality related values. Dee Wright offers the most advantageous location for viewing and comparing standards with prevailing conditions.
2. **Black Butte:** Air quality management description and display of methods being used to manage and maintain air quality and air quality related values. Black Butte offers an alternate location for viewing and comparing standards with prevailing conditions.

Sources of Additional Information

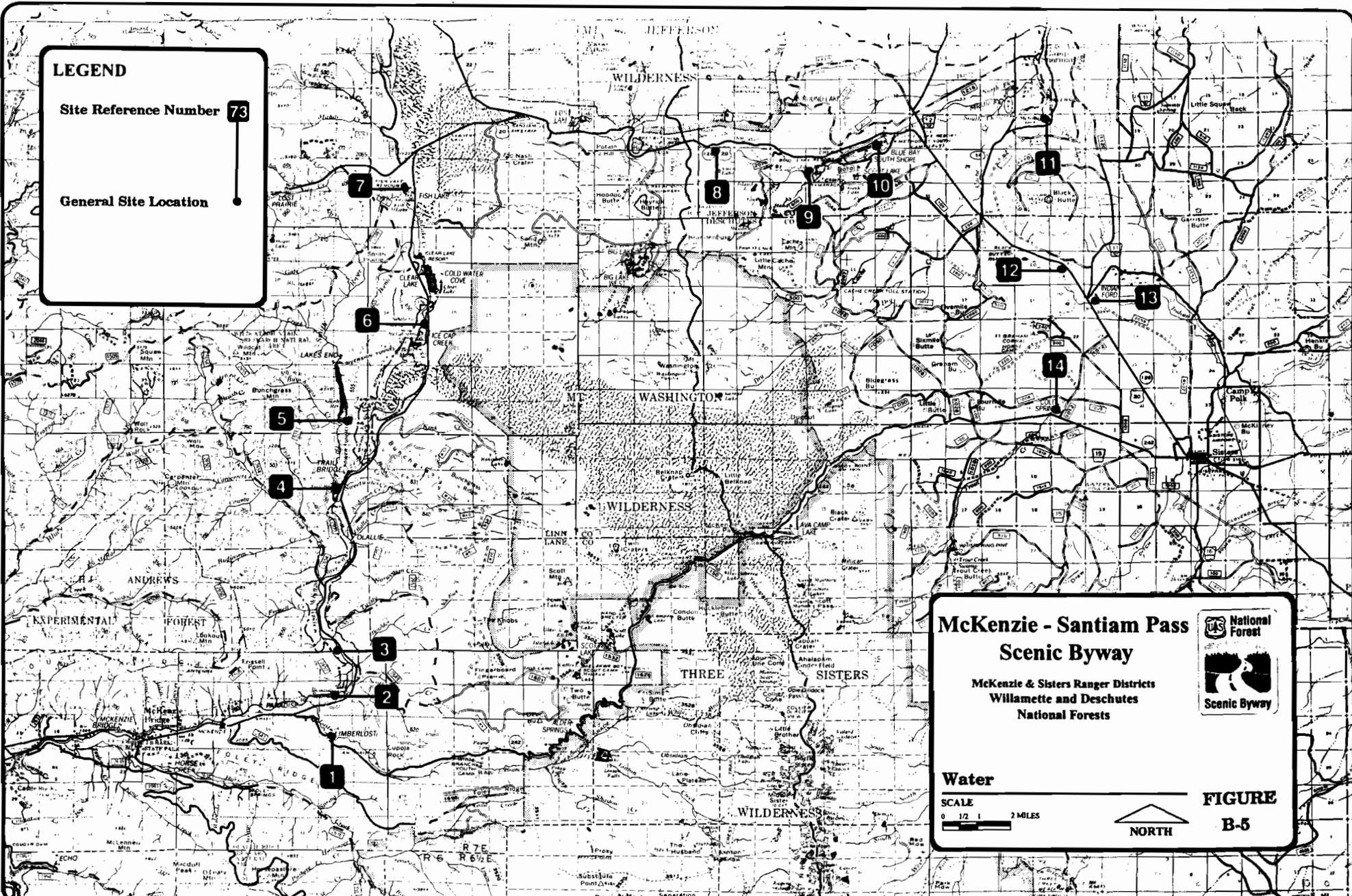
Land and Resource Management Plan and Environmental Impact Statement, Willamette National Forest, Eugene, Oregon, 1990.

Land and Resource Management Plan and Environmental Impact Statement, Deschutes National Forest, Bend, Oregon, 1990.

LEGEND

Site Reference Number **73**

General Site Location

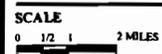


**McKenzie - Santiam Pass
Scenic Byway**

McKenzie & Sisters Ranger Districts
Willamette and Deschutes
National Forests



Water



**FIGURE
B-5**

LEGEND

Site Reference Number **73**

General Site Location

73

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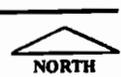
**McKenzie - Santiam Pass
Scenic Byway**

McKenzie & Sisters Ranger Districts
Willamette and Deschutes
National Forests

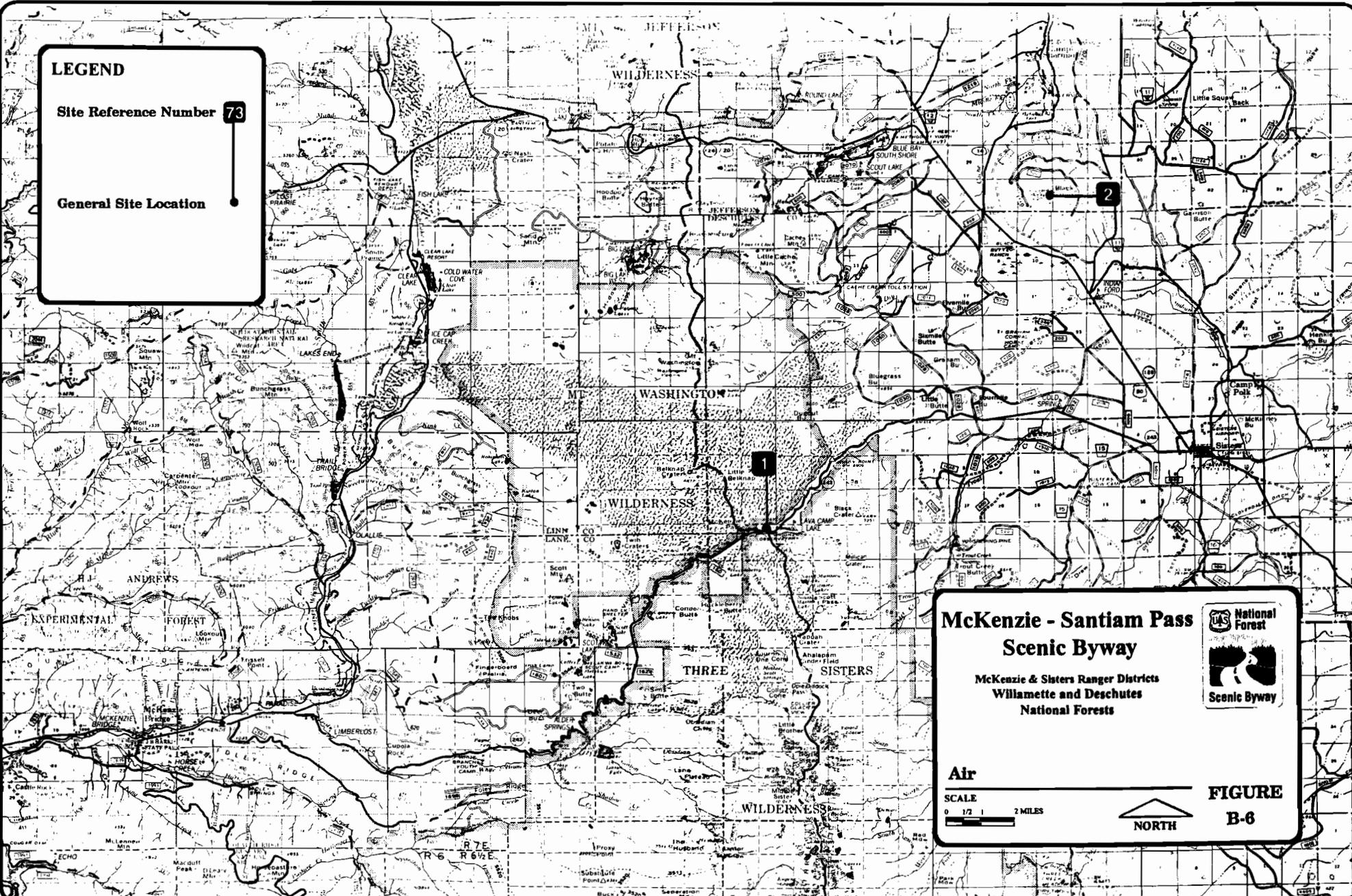


Air

SCALE
0 1/2 1 2 MILES



**FIGURE
B-6**



VEGETATION

Description

The vegetative cover of the Scenic Byway provides habitat for wildlife and protection to streams and rivers. It also stabilizes soil, produces oxygen and humidity, and serves as a vast storehouse of energy. Plants modify the air temperature by providing protection from both the summer heat and the winter cold and wind. The lush richness of the plants in the Byway provide an outstanding array of recreational settings.

The Scenic Byway traverses a wide range of plant communities in the area, including those within coniferous forests, meadows, subalpine and alpine parklands, and wetlands. Succession is the natural process by which one plant community or stand condition changes into another. As both deciduous and coniferous Forest tree species develop and mature the canopies close and herbs and shrubs that require direct sunlight start disappearing.

Temperature, moisture, light, and available nutrients are the factors which determine those plants which can most effectively occupy a site. After a relatively long, disturbance-free period, only those plants remain which can grow and reproduce in competition with their neighbors. Unless modified by disturbance, the growth of vegetation continues until the climax stage is reached.

The vegetation of the Scenic Byway can be grouped into several major coniferous Forest series. The coniferous series are characterized by both trees and understory vegetation. Within each series, there may be several plant communities or associations. The following descriptions of the vegetative series within the Byway rely on Hemstrom, Logan, and Pavlat (1987), Franklin and Dyrness (1973), and Plant Associations of the Central Oregon Pumice Zone (1988). The distribution of plant species within the Byway is dependent upon a number of factors including species characteristics, precipitation, temperature, and landscape patterns and account for subtle vegetative changes within major plant associations.

The Douglas fir series occurs on warm, relatively dry sites within the area. This is the northern extent of the Douglas fir series, occurring only on steep, south-facing slopes with thin, rocky soils (Means, 1980). The major climax tree species include incense cedar and grand fir, but Douglas fir generally dominates both the canopy and regeneration layer. Western hemlock is scarce or absent.

Important species include Douglas fir, incense cedar, sugar pine, ponderosa pine, bigleaf maple, oceanspray, poison oak, tall Oregon grape, dwarf Oregon grape, salal, whipple vine, grasses, snow queen, yerba buena, and others typical of Southwestern Oregon. On slightly more moist sites, the Douglas fir series melds into the western hemlock series. In this transition area, grand fir and western hemlock are co-climax on many sites within the Byway area. This transition area comprises the grand fir series. Climatic information is generally not available, but conditions should be intermediate between the Douglas fir and western hemlock series.

The grand fir series most frequently occurs on relatively dry, south-facing slopes and excessively well-drained river terraces. It extends into upper elevations, where it mixes with the Pacific silver fir series. This series includes a mixture of Douglas fir, western hemlock, and Pacific silver fir. Important species include Douglas fir, western hemlock, western red cedar, bigleaf maple, vine maple, dwarf Oregon grape, salal, rhododendron, swordfern, vanilla leaf, oxalis, twinflower, and redwoods violet.

The western hemlock series reflects climatic conditions of a strong maritime influence, with mild, wet winters and relatively dry, sunny summers. Temperatures range from slightly below freezing in winter to 90 to 100 degrees Fahrenheit in summer. Precipitation amounts vary from 60 to over 100 inches per year with most falling as rain or snow in the winter. Winter snowpacks are not deep or long lasting.

The Pacific silver fir series occurs on the western slopes of the Cascade Range within the Byway. Here the Pacific silver fir series dominates upper slopes (elevation 3,000 to 5,500 feet), mixing with the mountain hemlock series at the higher elevations. Important species in this series include Douglas fir, noble fir, Pacific silver fir, mountain hemlock, western hemlock, lodgepole pine, vine maple, dwarf Oregon grape, bigleaf huckleberry, Alaska huckleberry, rhododendron, grouse huckleberry, Cascades azalea, foamflower, false solomon's seal, queencup beadlily, dogwood bunchberry, sidebells pyrola, and beargrass. However, Fool's huckleberry and Cascade azalea are rare in this area and the presence of Devil's club is not widespread within the Byway.

Most of the annual precipitation in the Pacific silver fir and mountain hemlock series falls during the winter and accumulates as a deep snow pack at upper elevations. Mean maximum air temperatures usually occur in August and range from 75 degrees Fahrenheit to 63 degrees Fahrenheit at the transition to the mountain hemlock series. Growing seasons are short at upper elevations and summer frost frequently occurs in openings, particularly on gentle topography (Halverson and Emmingham, 1982).

The mountain hemlock vegetative type occurs at the upper elevations on both sides of the boundary between the Willamette National Forest and Deschutes National Forest (elevation 4,800 feet) along U.S. Highway 20. Lodgepole pine is an associated species. Wet meadows are visible to the south side of the highway, which mark the transition to mainly a true fir and Douglas fir vegetative mix. These mixed conifer stands are currently infested with western spruce budworm.

The mid-elevation mixed conifer stands extends east until the elevation drops to around 3,300 feet. Variations are represented at the east end of Suttle Lake by the presence of vine maple and alder along the outflow of the lake and the incense cedar along the highway east of Suttle Lake.

The ponderosa pine species begins to dominate as the elevation drops and moisture availability decreases due to weather patterns. The survival rate of the pine species exceeds that of the fir species and is evidenced by the prominence of ponderosa pine in the area. West of Black Butte Ranch there is a low area along U.S. Highway 20, where cold air accumulates, and the situation favors lodgepole pine. Due to a higher water table, this 'cold pocket' also favors aspen trees, and the change in vegetation type is noticeable.

Large examples of ponderosa pine and Douglas fir are represented in the Byway area. A large grove of ponderosa pine is designated in the Deschutes National Forest Land and Resource Management Plan as the Metolius Old Growth Grove. Within this stand the trees average 30 inches in diameter and 270 years of age.

The designation actually includes two old growth stands. The Metolius Old Growth Grove emphasizes the scenic and social value of old growth ponderosa pine while the Glaze Meadow area south of U.S. Highway 20 emphasizes the wildlife values associated with old growth ponderosa pine. Black Butte Ranch borders this area and some of the meadows around the Black Butte Ranch can be seen from the highway. These meadows, as well as Glaze Meadow, are fed by springs that maintain the water table which supports the riparian area and visible aspen stands.

Other variances to the lower elevation ponderosa pine vegetative type occur as less moisture becomes available. For instance, along U.S. Highway 20, bitterbrush and manzanita is present near Black Butte and Indian Ford, but is absent closer to the town of Sisters. Along the McKenzie Highway (State Highway 242) as you approach the Cold Springs area from the east, the vegetation changes once again to include the manzanita.

Non-forest types vary from small meadow openings in a forest matrix to rock cliffs, avalanche chutes, and extensive alpine and subalpine parklands. In general, stable non-forest communities indicate extreme environmental conditions: extremely rocky substrates, extremely dry or wet areas, extremely severe winter conditions, etc. Some non-forest openings are the result of disturbance in otherwise forested conditions. In these cases, down logs, abundant charred wood, or other signs of the previously existing forest are usually present. Some openings may be the result of heavy domestic livestock grazing; others were caused by humans who controlled the tree or shrub vegetation. Historically their primary use was to feed livestock, particularly sheep. Now elk and deer feed in these meadow areas.

Interpretive Opportunities

The vegetative cover of the Scenic Byway offers numerous opportunities for interpretation of its ecological development, and current expression of unique or unusual plant specimens. Each opportunity has a distinct feature or characteristic that could be featured in an interpretive display, brochure, or audio tape tour. These are listed below and their locations are illustrated in Figure B-7.

1. VEGETATIVE CHANGES

The progression of changes in ecological conditions and apparent changes in tree species along the Byway route provides opportunities that could be interpreted in a brochure or audio tape for use during an auto or bus tour.

2. COLD SPRINGS CAMPGROUND

The campground adjoins one of the more spectacular fall color areas along the route due to the abundance of aspen. Location of interpretive trails should take into consideration a sensitive plant species identified in the area.

3. DWARF TREES ALONG THE LAVA FLOWS

Located here are mixed conifers along lava flows that are exposed to, and survive in, a harsh environment.

4. OLD GROWTH GROVES

Recreation users of the Forest enjoy old-growth stands of trees for many different reasons. The old trees are aesthetically pleasing and provide a living connection with the past and a visual reference to the natural successional processes of the forest environment. Many people feel that the massive, towering trees in some old-growth stands have a cathedral quality and are spiritually uplifting and inspirational. These stands provide a feeling of solitude and escape from the evidence of human presence.

Old-growth stands are also important as a gene pool, conserving the diversity of characteristics which insures the survival of the species against attacks by insects and disease. These stands are also valuable for conducting research on the undisturbed organisms and processes of the forest ecosystem. Numerous locations are identified as possible interpretive sites.

Sources of Additional Information

Land and Resource Management Plan and Environmental Impact Statement, Deschutes National Forest, Bend, Oregon, 1990.

Land and Resource Management Plan and Environmental Impact Statement, Willamette National Forest, Eugene, Oregon, 1990.

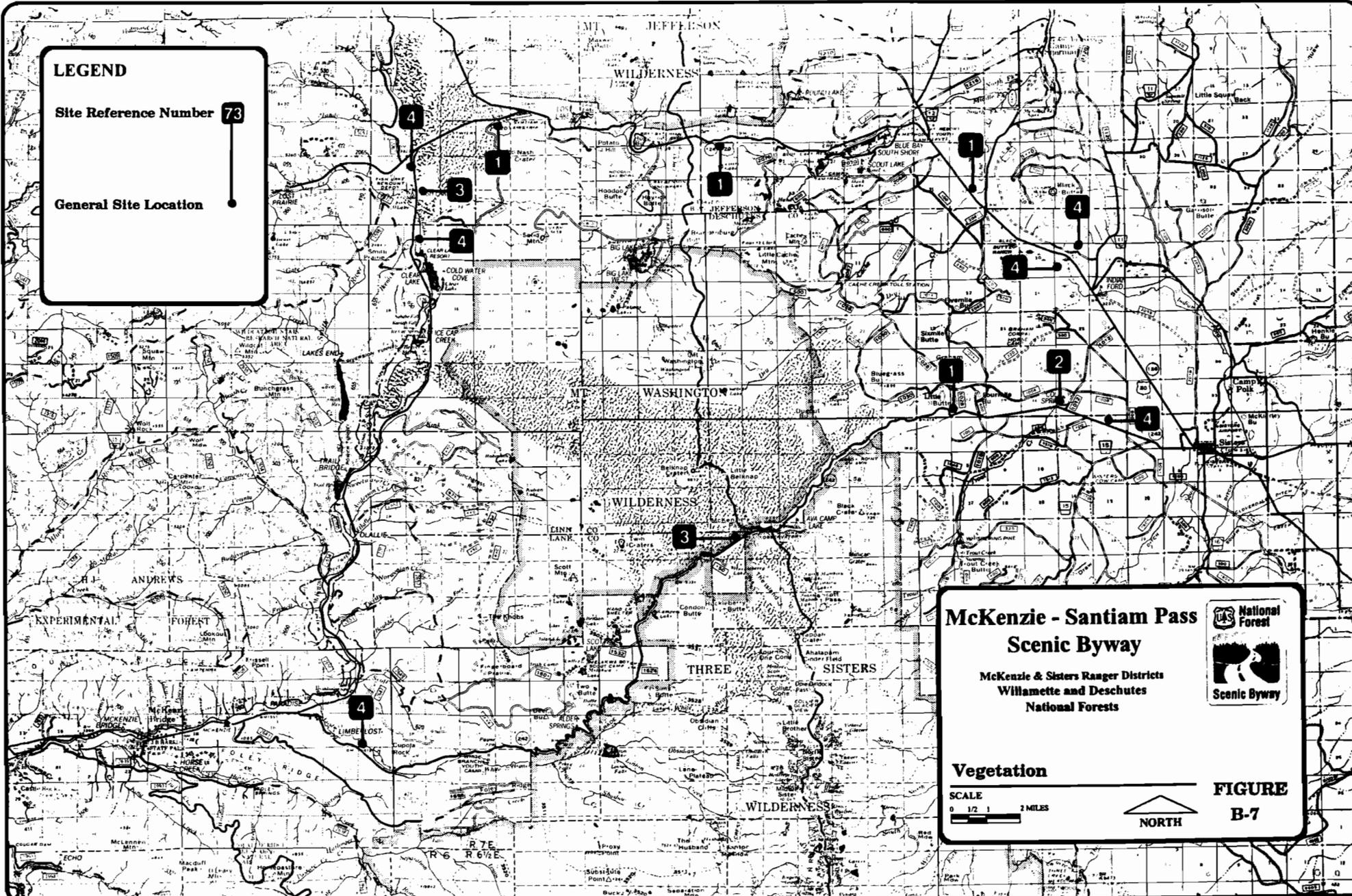
Budworm Position Paper written by Andris Eglitis, Entomologist, Deschutes National Forest, Sept., 1990.

Trees to Know in Oregon written by Charles Ross, OSU Extension Service, Extension Bulletin 697, Reprinted Jan., 1989.

LEGEND

Site Reference Number **73**

General Site Location



**McKenzie - Santiam Pass
Scenic Byway**

McKenzie & Sisters Ranger Districts
Willamette and Deschutes
National Forests



Vegetation

SCALE
0 1/2 1 2 MILES



**FIGURE
B-7**

FIRE

Description

Fire has played a key role in the development of forest ecosystems within the Scenic Byway area. Fires influence many segments of the physical and biological Forest environment. These segments include plant species and communities, insects, parasites, fungi, and wildlife habitat patterns and populations. Fires also influence major ecosystems processes and characteristics such as nutrient recycling, energy flow, succession, diversity, productivity, and stability. Factors such as fire frequency, duration, intensity, and size all have an outcome on these fire influences.

At low elevations, areas were burned by large, lightning-caused fires between 120 and 450 years ago. Catastrophic fire intervals in the upper elevations, including the Pacific silver fir zone, may have been over 500 years apart. Over time, these fires have maintained the Douglas fir vegetation characteristic of the west side and the Ponderosa pine/lodgepole pine characteristics of the east side of the Cascades.

Little is known about fires caused by native Indians. As trappers and settlers moved through the Cascades in the mid-1800's some fires were intentionally set. Some resulted from campfires left burning which caused an increase in fire frequency. Since the early 1900s fire suppression efforts in the area have affected fire occurrence patterns and, in particular, potential large stand-replacement fires have generally been suppressed at a smaller size.

Fire occurrence in the area is characterized by "peaks and valleys", with frequent periods of low fire occurrence and occasional periods of extremely high fire occurrence. Lightning fire occurrence is far more cyclic here in the Cascade Range than it is in eastern Oregon. The majority of fires are of low to moderate intensity and are normally suppressed at a small size.

Some fire-related ecosystem processes have been duplicated while others have been changed by management activities on the Forest. As mature and old growth stands have been harvested, the timber has been removed and the remaining slash has been burned. These activities have created a divided mosaic of clearings and older stands. The use of prescribed fires of low to moderate intensity have changed soil, watershed, and vegetation characteristics less drastically than catastrophic wildfire. Generally, there have been smaller areas burned and, except for short-term slash accumulation during harvest, there has been a reduction in the overall risk of fire.

Historically, prescribed burning has been the most common tool used for the reduction of logging residues, natural dead and down debris, and the preparation of areas for reforestation. Currently all fires are suppressed with an emphasis on the most cost-effective response to fire suppression. A wide variety of techniques and practices are used to minimize resource loss and suppression costs from debris burning, industrial operation, and railroad fires.

Perhaps the most prominent fire within the Scenic Byway area resulted from a lightning strike in 1967. This fire is referred to as the Airstrip Burn because of its proximity to a landing field in the area. The burn consumed 5,400 acres of forested land and burned for approximately two weeks before it was extinguished. Now 26 years later evidence of this fire remains prominent in the area.

While an increase in use of the Forest setting increases the risk of human-caused fires, increased use also contributes to early detection and, in some cases, suppression of small fires.

Prescribed burning is scheduled to avoid smoke intrusions into smoke sensitive areas and to minimize air quality impacts during summer holidays and high-use periods. The State Forester's Office and the Oregon Department of Forestry coordinates all forest and agricultural burning in the area. On a limited basis, prescribed fire may be reintroduced to both natural and historic meadows. Although early settlers managed historic meadows with fire, aggressive fire suppression has generally excluded fires from these meadows in recent years. The elimination of fire has caused an encroachment of trees and the loss of natural meadow ecology.

Expected increases in public use of the Forest will provide additional opportunities for public contact. Fire prevention and cooperative fire prevention efforts with local fire departments and the Oregon State Department of Forestry (OSDF) will continue in order to maintain the low levels of human-caused fire incidents.

Interpretive Opportunities

The fire history of the Byway and its role in the management of forest resources provides several interpretive opportunities. The location, size and age of each fire incident provides a rich interpretive basis for discussing the varied contributions of fire to the Forest ecosystem. The locations of several fire occurrences that may serve as a framework for interpretation are listed below and are illustrated in Figure B-8.

Airstrip Burn
Cupola Rock Fire
Black Butte Fire

Sims Ranch Fire
Peggy Creek Fire
Lava Flow Fire

Sources of Additional Information

Land and Resource Management Plan and Environmental Impact Statement, Willamette National Forest, Eugene, Oregon, 1990.

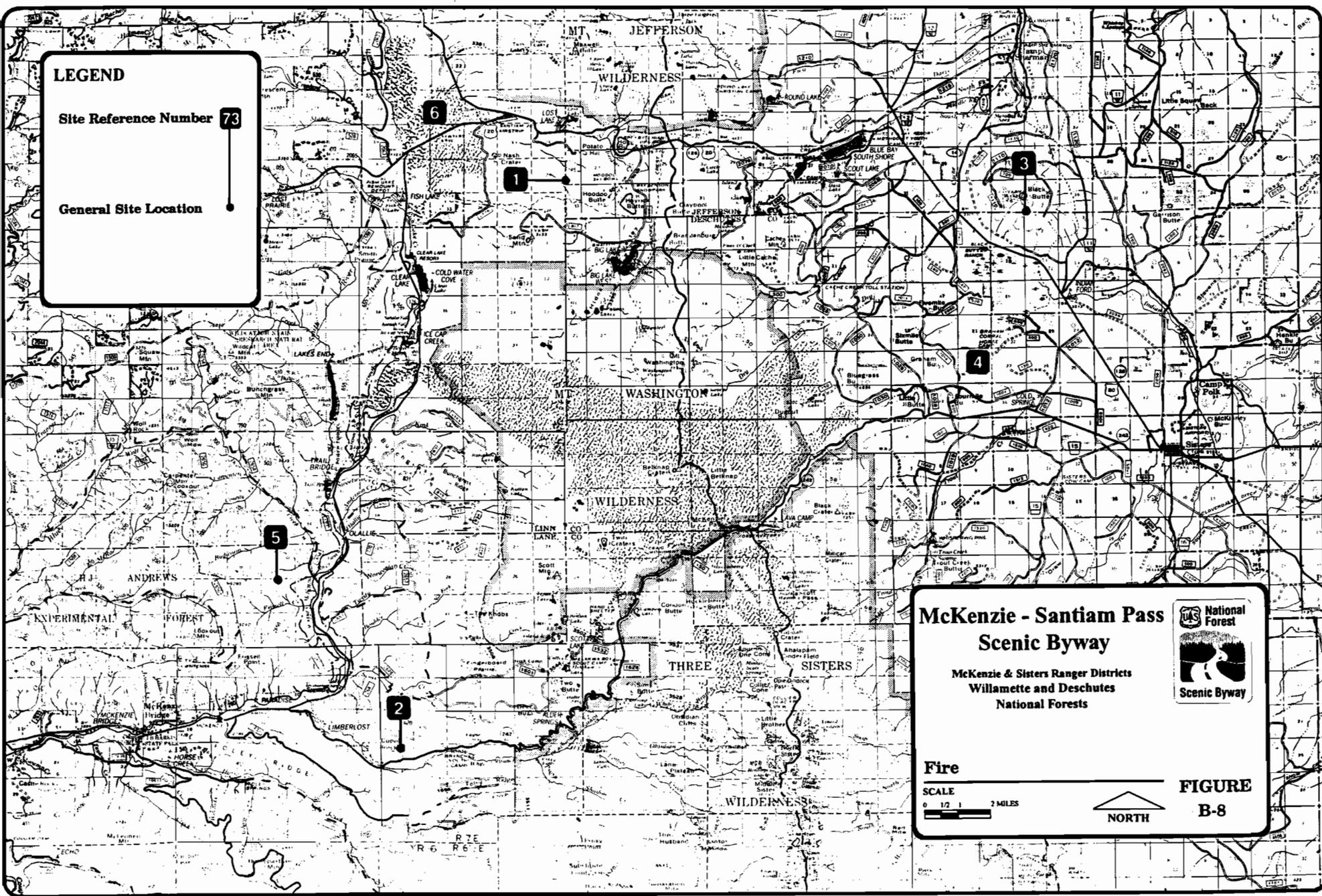
Land and Resource Management Plan and Environmental Impact Statement, Deschutes National Forest, Bend, Oregon, 1990.

Rakestraw, Lawrence and Mary, History of the Willamette National Forest, USDA Forest Service, Eugene, Oregon, 1991.

LEGEND

Site Reference Number **73**

General Site Location



**McKenzie - Santiam Pass
Scenic Byway**

McKenzie & Sisters Ranger Districts
Willamette and Deschutes
National Forests



Fire

SCALE
0 1/2 1 2 MILES



**FIGURE
B-8**

FISH

Description

Of the several species of fish found within the Scenic Byway, most are native to the natural streams and lakes of the area. A native species is one which has always occurred here, reproducing on its own. Additionally, several species have become naturalized, primarily in lakes and reservoirs. A naturalized species is one that was introduced from other parts of the country or world and has been able to reproduce on its own.

Several native and naturalized species are artificially propagated to meet a variety of fish management objectives. By far the most abundant group is in the Salmonidae family. Fish in this family include anadromous, as well as resident species, and native, as well as naturalized species.

The spring chinook, winter steelhead, and summer steelhead are the most important anadromous species. Anadromous fish spawn and grow to smolt size in Forest streams before migrating to the Pacific Ocean where they grow to adulthood. Smolts are juvenile salmon or trout that have undergone physiological changes which allow them to adjust to increased salinity of ocean water. These fish then return to their natal river to rest prior to spawning and completing their life cycle.

Rainbow, cutthroat, and bull trout (formerly known as the dolly varden) are the most abundant native species of resident trout. Brook trout have been widely distributed in the High Cascade lakes and have naturalized in many areas. However, several salmonid species have limited distribution.

Within the Byway area native bull trout populations exist only in the upper McKenzie River drainage. Although brown trout have not been stocked for many years, naturalized populations persist in Leone Lake and Linton Lake. The population of cutthroat trout found in the Hackleman Creek drainage currently receives special protection while fish systematists compare it to other stocks of cutthroat. Its long period of isolation, caused by lava flows 8,500 years ago, provides an excellent opportunity to study genetic differences caused by isolation.

The bull trout is on the Regional Forester's sensitive species list as a consequence of it being on the U.S. Fish and Wildlife Service Category Two list for species to be considered for threatened status. The only known locations of bull trout within the Scenic Byway is in the upper McKenzie River.

Another species of interest is a unique race of native cutthroat trout (*Oncorhynchus clarki*). This race of cutthroat trout populates Hackleman Creek year around. When Fish Lake is full of water in the winter and spring the trout occupy it also. To protect this race of trout, the Oregon Department of Fish and Wildlife (ODFW) has ruled that fishing in the creek is not allowed.

The Scenic Byway offers diverse settings, species, and opportunities for fishing. Opportunities range from: fishing by boat or from the shore in reservoirs; to hike-in fishing with bait in Wilderness lakes; to fly fishing in a large river such as the McKenzie River or the Metolius River.

Management of the Forest's fishery resources is a shared responsibility between the Forest and ODFW. The State is responsible for setting seasons and manipulating the populations either through stocking or restrictive gear regulations. The Forests are responsible for maintenance of existing habitat, improving or expanding habitat, and for investigating fish/habitat relationships.

The intricate relationships between the fish and their habitat requires continual interagency contact and coordination. Management practices are also coordinated with the management plans and policies established by the Northwest Power Planning Council as well as other agencies.

Fish habitat within the Byway has undergone significant modifications in the last four decades. In the 1950s and 1960s, construction of hydropower reservoirs isolated anadromous fish habitat and impaired the productivity of an additional habitat. As a consequence of dam construction the addition of the surface area of reservoir water provides opportunities for management of warm and cold water resident species.

Populations of anadromous fish and resident fish have followed distinctly different trends during the last several decades. Since 1950, the native anadromous fish populations have decreased significantly. They have largely been replaced by fish released from the hatcheries. Smolt mortalities associated with Eugene Water and Electric Board (EWEB) diversions on the McKenzie River and other dams have decreased those stocks considerably.

The summer steelhead stocks introduced by the ODFW have become naturalized in the McKenzie River system. The wild smolts, in conjunction with continued hatchery liberations, have generated an excellent population of summer steelhead using the McKenzie River and its major tributaries.

The overall supply of native resident cold water fish is not known to have changed significantly over time. However, populations inhabiting several major streams may have been depressed as a result of the 1964 flood or other habitat distresses. There is some indication that bull trout may now inhabit fewer areas than they did previously.

Fish stocking by the State (Fish Commission) began as early as 1912 in Linton Lake and others. During 1913, the Oregon Fish Commission stocked several lakes with eastern brook trout. To help sustain the relatively intense fisheries on moderate to large rivers, the ODFW has developed a large-scale program of stocking fishing streams with legal-sized fish.

Concurrently, they stocked the reservoirs and selected road-accessed lakes with both legal-sized and fingerling trout and salmon. Less accessible lakes were stocked with fingerling trout, first by pack horse, then by fixed-wing aircraft, and more recently by helicopter.

Important fish species within the Byway include those belonging to the family Salmonidae. These include: the native species of spring chinook, winter steelhead, rainbow trout, cutthroat trout, bull trout, and mountain whitefish; and the introduced species of summer steelhead, brook trout, brown trout, and sockeye salmon that have become naturalized. These species support major recreational fisheries along the Scenic Byway.

The stream fishery for resident trout is supported primarily by wild native cutthroat and rainbow trout. The cutthroat are the main contributors in the small tributaries and head water streams. The rainbow are the major target in moderate to larger-sized streams. Hatchery augmentation of trout populations in streams has gradually been reduced and is now limited to a few intensively fished areas. Special fly-fishing only regulations on the Metolius River provide a unique opportunity to fish for native rainbow and cutthroat trout at high population levels.

Interpretive Opportunities

The fisheries resource within the McKenzie Pass - Santiam Pass National Scenic Byway offer several significant opportunities for interpretation and development. Each opportunity has a distinct characteristic that could be featured. These are listed below and their corresponding locations are illustrated in Figure B-9.

1. Spring Chinook

Spring chinook salmon are found from the start of the Byway to the Trailbridge Reservoir. The characteristic that could be featured is the economic contribution this stock (+ 5,000 fish) makes to the marine and estuarine commercial fisheries and the premier intra-city sport fishing in the nation.

The most obvious places for some sort of interpretive development would be the EWEB spawning channel below Trailbridge Reservoir, or Lost Creek Campground. The fact that these fish are large, in the river for some time, and are very obvious during spawning makes them an attractive subject for photographers and observers.

Development could be as simple as a photographic display of the species life history and anadromous behavior, or as extensive as a viewing chamber where spawning, incubating, and rearing could be observed directly. Displays, videos, or narrative tapes could provide a more detailed explanation of the stream ecology and the role of spring chinook in the species mix.

2. Bull Trout

Bull trout are found from the start of the Byway to Tamolith Falls, including Trailbridge Reservoir. The key characteristic that could be featured is the ecological role of bull trout as the "top predator" of the aquatic ecosystem and the unique habitat needs/behavior patterns associated with that role. The most obvious places for interpreting/educating visitors regarding this species would be at Trailbridge Reservoir or at the EWEB spawning channel.

Although bull trout are the largest "resident" fish in the system, their scarcity and propensity for utilizing the bottoms of deep pools would make developing a display featuring live specimens quite difficult. At least until the bull trout abundance increases, the interpretation would probably be a photographic and artistic rendition of the bull trout life history, behavior, and role in the aquatic ecosystem. Most certainly, a feature on management to help people understand the changing view of the importance of bull trout and the rationale for the current restrictive harvest regulations should be included.

3. Cutthroat

Cutthroat trout found in Hackleman Creek and Fish Lake are unique. The key characteristic that could be featured is the scientific significance of this stock as a genetically isolated population against which other cutthroat populations throughout the west have been compared. How this species has adapted to utilizing an ephemeral lake for part of the year and the inflow stream for the rest of the season is also an interesting subject.

The most obvious locations for interpretation would be at the Fish Lake Campground/Guard Station and Lost Prairie Campground. This particular stock of cutthroat was isolated from all other Northwest cutthroat by lava flows some 8,000 years ago. Thus, they represent narrowly defined but genetically well-mixed, stock. The genetic characteristics of other stocks may be compared against the cutthroat.

Typically, cutthroat trout utilize small stream type habitat with a prey base of aquatic and terrestrial insects, a few amphibians, and a few other fish. An 8-inch fish may be considered quite large. In Fish Lake, their prey base is largely unknown. The fact the fish have the opportunity to get considerably larger suggests they have evolved to use either larger or more abundant species while inhabiting the lake.

An additional interpretive feature could include the importance of the cutthroat trout and Fish Lake waterfowl as a prey base for bald eagle, osprey, mink and otter. The interpretive display could include photos, art work, etc., that delineate trout use of cold-water habitats. Specifically, the display could show how they have adapted to the Fish Lake/Hackleman Creek ecosystems.

Lost Creek Campground could also be the site of an artificial stream display. This would allow visitors a more in-depth understanding of the aquatic ecosystems and the role of various species. This topic could also be a sideboard at the interpretive location for the lava flows.

4. Hatchery Trout

Hatchery trout are planted extensively throughout the Scenic Byway area. The key characteristic that could be featured is how they provide fishing opportunities in the variety of habitats that lack the ability to support significant or totally native populations. Logical places for interpretation include the western terminus of the Old McKenzie Highway (State Highway 242), Santiam Pass, and Trailbridge Reservoir. The interpretive facility or display could be developed around several different themes, depending upon the target audience.

Interpretation could feature the variety of habitats found locally, limiting factors inherent in each, the characteristics of the variety of fish species and life stages being stocked, and the expected outcome. Another approach would be to have a fast-changing display that would emphasize the best fishing opportunities available locally at that particular time. It could also include the license and regulation information and a "tackle tip" or two.

If the target audience is more generalized, the display could feature how the USFS and partners (ODFW and EWEB) try to meet the variety of recreational demands by managing habitat, setting regulations, and stocking fish to create angling opportunities.

Sources of Additional Information

Land and Resource Management Plan and Environmental Impact Statement, Willamette National Forest, Eugene, Oregon, 1990.

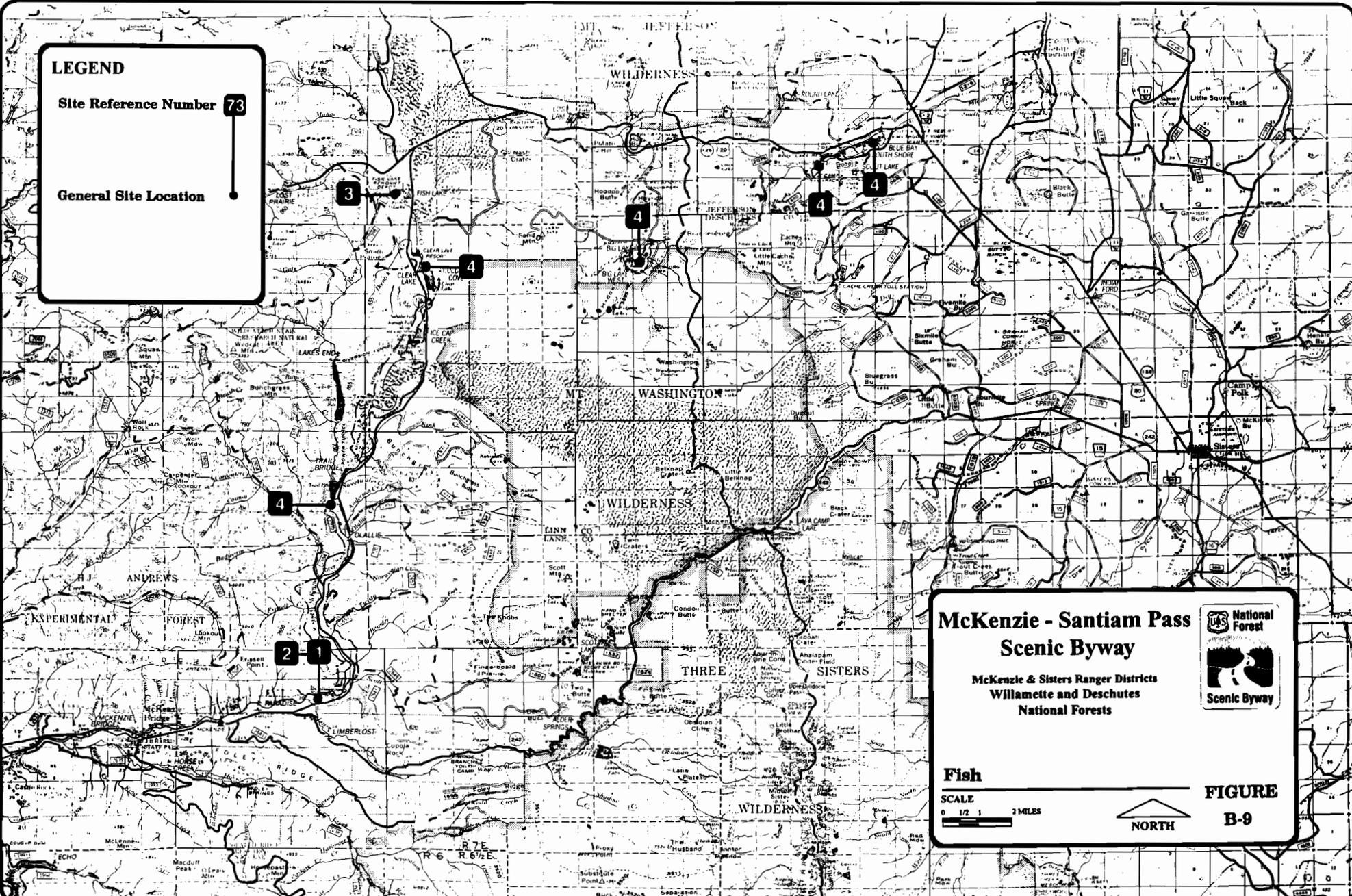
Land and Resource Management Plan and Environmental Impact Statement, Deschutes National Forest, Bend, Oregon, 1990.

LEGEND

Site Reference Number **73**

General Site Location

73

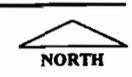
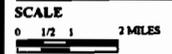


**McKenzie - Santiam Pass
Scenic Byway**

McKenzie & Sisters Ranger Districts
Willamette and Deschutes
National Forests



Fish



**FIGURE
B-9**

WILDLIFE

Description

The Scenic Byway area provides diverse habitats which support many vertebrate wildlife species including reptiles, amphibians, mammals, and birds. Within the area all reptile and amphibian species are yearlong residents, as are most of the mammal species. Some of the predatory mammals (coyote and cougar) and hoofed mammals (deer and elk) move to lower elevations in winter.

Several important roles are played by wildlife within the Byway. As predators, animals act as natural controls of insect populations, helping reduce the frequency and severity of epidemics. Predators also remove sick and weak individuals, influencing the populations of prey species. Burrowing or tunneling animals aerate the soil and carry the remains of plants and prey to lower levels.

All of these smaller animals in turn support a host of larger predators. Animals that feed on plants and their seeds are agents in helping to disseminate seed. Some are pollinators; others browse or clip vegetation for food. As certain animals dig and grub for food in logs they are helping with the breakdown of this larger material that enables quicker decomposition of organic matter.

Aquatic animals, like the beaver, alter water flow patterns and create marshes and meadows. Beaver ponds also provide excellent habitat for resident trout and young anadromous fish. Wildlife also benefit local economies through income generated from tourism, hunting, sightseeing, and recreation.

Habitat conditions are the prime determinants of wildlife abundance within the Byway, both in the number of species and the number of individuals over time. The abundance of most wildlife species is directly dependent upon the condition of available habitat, whether used for breeding, feeding, or resting. Some species, such as dippers along streams, spend most of their time in a specific type of habitat. Other species, such as the raven, seem to use everything that is available. Yet other species are somewhere in between, using mainly two or three major types of habitat. Several of the more apparent habitat types present within the Byway are described below.

Old Growth and Mature Conifer Habitat

Old growth and mature conifer habitat provides the feeding, resting, and breeding areas that are required by the northern spotted owl, pileated woodpecker, and pine marten. These species represent wildlife associated with late seral stages of forest development. As ecological indicators, these wildlife species represent all species which may be affected by limited amounts, distribution, and quality of mature and old-growth coniferous forests.

Bald Eagle Habitat

The bald eagle is listed in the Federal Register as a threatened species. Examination of forest conditions near nest sites has shown that bald eagles require forests with old-growth characteristics for nesting (Anthony and Isaacs, 1989). The diameter and height of individual nest trees are usually the dominant and largest diameter trees in the stand. Bald eagles require large trees with stout,

thick limbs to support their large nests which may be up to 10 feet in diameter and can weigh in excess of several hundred pounds (U.S. Department of Interior, Fish and Wildlife, 1986).

Bald eagle roosting and feeding areas are usually associated with rivers, lakes, and reservoirs. No communal roost sites have been identified within the Byway. Resident and wintering populations tend to be dispersed within territories around foraging areas. Human activity can adversely affect feeding bald eagles (Stalmaster and Newman, 1978). The availability of, and access to, fish, water-fowl, invertebrates, and carrion becomes critical in nesting season as young bald eagles are less tolerant of food deprivation than adults. Surveys indicate the presence of bald eagle pairs within the Byway areas of Clear Lake, Suttle Lake, and Blue Lakes.

Certain river or lake locations within the Byway area of both Forests are extremely important feeding and nesting sites for the bald eagle. These areas are managed to enhance the carrying capacity of bald eagles. The Byway passes by two designated Bald Eagle Management Areas near Suttle Lake and Blue Lake where nesting habitat and foraging areas will be protected and enhanced.

Dead and Defective Tree Habitat

Dead and decaying trees (snags) are a vital component of the Forest ecosystem. Many wildlife species are dependent on these deteriorating trees for nesting, roosting, foraging, and other life functions. Wildlife species dependent on dead and defective trees are represented by a group of birds referred to as primary cavity excavators.

Some species, such as western bluebirds, tree swallows, and violet-green swallows, are secondary cavity nesters and use snags located in early seral forests. Other species are associated with closed canopy stands. Snags are also food storage sites where a variety of birds and mammals cache prey and other food items. Reproductive behavior and territorial defense for specific species may be critically tied to snag numbers and distribution.

Deer and Elk Habitat

This habitat is typically found where large patches of old-growth timber provide optimal cover interspersed with meadows, major riparian areas, and harvest units. Roosevelt elk, blacktailed deer, and mule deer utilize similar habitats within the Byway and all species migrate using summer and winter ranges. The range of Roosevelt elk, blacktailed deer, and mule deer includes all of the Scenic Byway area.

During the winter months, much of the Byway route is covered by deep snow. As a consequence, the herds of deer and elk that range over the area during the summer months are restricted to significantly smaller low-elevation winter range areas for much of the time between November through April. Winter range habitat must supply deer and elk with optimal cover, an available food supply, and security. Without these habitat features, wintering populations suffer high mortality during winter periods. Surviving cows and does have a low potential for producing viable young the following year.

Elk are generally found in key habitat areas within the Deschutes National Forest, none of which are identified next to the Byway. However, elk do migrate from the Cache Mountain area south of the Santiam Highway to a key area identified in the Lower Metolius area. During this migration

they pass across the Byway between Suttle Lake and Black Butte. Elk are also present on the western portion of the Byway, occupying the upland and high country areas adjacent to the route.

On the east side of the Cascades two populations of mule deer inhabit the Byway area. They have been identified and are managed by the the Oregon Department of Fish and Wildlife (ODFW). These populations of mule deer are identified with Management Units established by ODFW. The Upper Deschutes Management Unit is located south of the McKenzie Highway, and the Metolius Unit encompasses the remainder of the Sisters Ranger District. Both deer and elk are important game species within the Byway. They are important, not only economically to local communities which benefit from the revenue generated by hunters, but also to recreationists who enjoy viewing and photographing large game species.

Special and Unique Habitats

Special and unique wildlife habitats are found throughout the Byway. These habitats are often associated with natural forest openings, riparian areas, meadows, hardwood forests, or geologic features such as cliffs, talus, caves, and open water. Meadows provide foraging areas for numerous species including elk, bear, deer, and song birds. Predators including hawks, owls, falcons, coyotes, and foxes use meadows and riparian habitats extensively while hunting.

Caves are an important habitat element for bobcats, cougars, and bats by providing shelter, roost, den sites, and protection from other predators. Although these habitats are a relatively small part of the Byway area, they contribute significantly to the diversity of wildlife species.

Within the the Byway such species as the Golden eagle and redbtail hawk can occasionally be seen overhead. Ospreys are common in the area of Blue Lake. Goshawks can also be seen in the Glaze Meadow area off U. S. Highway 20 and Coopers hawks and sharp-shinned hawks may be seen anywhere along the Byway route.

Interpretive Opportunities

Wildlife resources within the McKenzie Pass - Santiam Pass offer many opportunities for the public to gain an awareness about the area's numerous wildlife habitats and the interactions of its resident species. Following is a listing of habitat types and a few of the characteristic species found in the area during the summer months. The location of these interpretive opportunities are also illustrated in Figure B-10.

Deer and Elk:

Big Game Emphasis Areas - There are also two big game management emphasis areas within the Scenic Byway area. The moderate emphasis area where Forest management practices will be evaluated for their effect on elk. Some road closures, forage improvement, and other activities may be needed to maintain habitat quality. The high emphasis areas have 1.5 miles of road per section. Forage is high-quality and evenly distributed throughout the area. However, intensive management practices may need to be employed to maintain optimal cover within the winter range component of the deer and elk habitat.

Mule Deer Migration Routes - The deer within the Metolius Herd Management Unit move across the Santiam Highway throughout the spring, summer, and fall. Movement is primarily at night or early morning and approximately 75 to 100 deer are lost each year in vehicle accidents. This is the only area of concern identified along the Byway as a safety problem involving wildlife.

The Sisters Ranger District is working with the Oregon Department of Transportation to seek solutions to the situation. The State Highway maintenance crew from Sisters currently record the date and location when deer killed due to vehicle accidents are found along the Highway. Opportunities exist to inform Byway users where the primary crossing points are located, and also to describe what measures are being employed to minimize the wildlife losses from vehicle encounters.

Primary Cavity Excavators:

Habitat locations - Snags, live defective trees, and down logs provide the critical habitat for primary cavity excavators and secondary cavity users. Primary cavity excavators are those birds, other than pileated woodpeckers, which require dead and defective trees for nesting, roosting, and foraging. Primary cavity excavators create new cavities each year for roosting and nesting.

Species of primary cavity excavators include the red-breasted nuthatch, northern flicker, hairy woodpecker, downy woodpecker, red-breasted sapsucker, Lewis' woodpecker, black-backed woodpecker, and northern three-toed woodpecker. Many of these bird species found within the Byway area migrate to southern latitudes in the winter.

Specific Interpretive Sites:

1. Bald Eagle Management:

Blue Lake and Suttle Lake - The Byway passes by two Bald Eagle Management Areas near Suttle Lake. These areas have been established to maintain habitat for bald eagles using the Suttle Lake and Blue Lake areas. Bald eagle nesting and foraging habitat are being protected to ensure the continued use of the area by bald eagles. Bald eagles prefer large mature trees for nesting and perching, and also require large open bodies of water for feeding. Bald eagle sightings have been reported in the Suttle Lake area since 1973. Development potential for interpretation would be primarily through brochures and audio tapes in a drive-by situation.

2. Old Growth Habitat:

Metolius Old Growth Grove - The Byway passes through this area, which was established to provide an old growth ecosystem for plants and wildlife associated with old growth ponderosa pine habitat, and for public enjoyment of large tree environments. Two old growth stands are included in this Management Area. They are the Lower Black Butte Old Growth Area north of U. S. Highway 20 and Glaze Meadow Old Growth Area to the south.

Fire has played an important role in the maintenance of these old growth ponderosa pine ecosystems. Since natural fires have been removed from this area other mechanical treatments have been implemented to maintain old-growth habitat. Some of the wildlife species associated with this type habitat are Goshawk, Flammulated owl, and White-headed woodpecker. The Forest Plan for the Deschutes National Forest provides for "modest interpretive facilities, parking areas, and trails" in the Lower Black Butte Old Growth Area and

in certain locations within the Glaze Meadow Old Growth area "where it does not conflict with wildlife values".

U. S. Highway 20, Fish Lake Creek, and Lost Creek Old Growth Groves - The Scenic Byway route encompasses three areas established as Old Growth Groves on the Willamette National Forest. The U. S. Highway 20 Grove is located at the junction of U. S. Highway 20 and State Highway 126. The Fish Lake Creek Grove is just north of Clear Lake and the Lost Creek Grove is located west of Limberlost Campground near the junction of State Highway 242 and State Highway 126. Although all of these groves provide habitat for old-growth-dependant species, their primary emphasis is the preservation of representative ecosystems of old growth forests of the Western Cascades. Another emphasis is to provide opportunities for the public to enjoy the educational, aesthetic, and spiritual values associated with the old-growth timber successional stage.

3. Northern Spotted Owl:

Conservation Habitat Areas (CHAs) have been established to maintain habitat for the Northern Spotted Owl and other Federal threatened species. The spotted owl prefers mature and old growth mixed conifer habitat for nesting and foraging. A network of CHAs has been established over the entire range of the spotted owl that will ensure the continued survival of this owl species. The four areas along the Byway total about 12,000 acres and include owls actively nesting and reproducing within them.

The Northern Spotted Owl is found in mixed conifer forests along the Cascade Mountain Range. Multi-layered canopies associated with old-growth stands provide favorable roosting habitat that moderates temperature extremes, producing shade during warm weather, and buffering the effects of cold, wet weather, and snow. The principal prey species of the spotted owl are primarily found in mature and old-growth Forests.

The northern flying squirrel is the most abundant prey species in spotted owl diets in this portion of its range. Northern spotted owls do not build nests, but rely on pre-existing cavities, broken tops, or platform structures as potential nest sites. Large, decadent trees with missing limbs and tops provide these cavities and platforms for spotted owl nests.

Conservation Habitat Areas (CHA) - The McKenzie Pass - Santiam Pass Scenic Byway passes through, or is adjacent to, three CHAs. These CHAs vary in size and configuration in relation to the location and distribution of suitable habitat. New legislation pending on these areas will determine management needs of the spotted owl and, when adopted, how activities must tier to the recovery strategy for the owl.

In the interim, management of these areas shall remain consistent with the Interagency Scientific Committee recommendations. Portions of three CHAs areas along the Byway that are visible, or immediately adjacent to, the highways offer the best opportunities for interpretation through brochures or audio tapes. Included is an area visible from the existing overlook site for Mt Washington.

4. Pileated Woodpecker:

Habitat locations - The pileated woodpecker represents those wildlife species which use large, standing dead trees (snags) and mature/old-growth trees when nesting, roosting, or foraging. Downed logs also serve as an important habitat function by providing foraging areas

for insect and fungi eating species, as well as habitat for many reptiles and amphibians. The diet of the pileated woodpecker consists predominantly of carpenter ants, termites, and other insects found in decaying wood. Foraging surfaces tend to be decayed tree trunks, dead limbs, snags and downed logs associated with mature and old-growth Forests (Mannen et al., 1980). Nesting habitat is most often found in mature and old-growth Forests.

5. **Marten:**

Habitat locations - Marten (*Martes americana*) represent wildlife species dependent on mature and old-growth forests for at least a portion of their life history needs. Marten home ranges often include several seral Forest conditions, ranging from poles to old-growth. Dead, down, and defective trees characteristic of old-growth Forests and seral fire regenerated Forests are critical to marten survival. Downed logs and snags provide potential den sites and access to small mammal prey that are active during winter months (Clark and Campbell, 1976).

An overhead Forest canopy provides protection from aerial predators (Herman and Fuller, 1974). The recommended habitat area for marten includes at least 160 acres of contiguous mature or old-growth forest. Home range size of individual marten may be significantly larger (Irwin and Cole, 1987). Little information is available on home range size or habitat use on the west slope of the Cascade Mountains.

6. **Riparian Habitat**

Indian Ford Creek - Provides riparian habitat important to herons and beaver living along the creek.

American Dipper - Strictly tied to flowing streams and rivers. Builds nest of moss, interwoven with rootlets and blades of grass, usually on side of rock or upturned rootwad (sometimes under bridges), and often near water spray, or behind a waterfall. Feeds on various stages of invertebrates most often by walking under water.

Water Shrew - Most frequently found along streams and lakes and in adjacent riparian areas.

7. **Special Wildlife Habitats**

Special habitats are maintained or enhanced in many areas of the Scenic Byway to assure continuation of important components of healthy, biologically diverse ecosystems. Numerous areas have been established in the Byway for this purpose.

Other Species:

Brown Creeper - nests under loose bark in dead or partially dead trees. Large trees usually provide the best nesting habitat. This bird feeds on insects in nooks and crannies in the bark of trees while working from the bottom up, then flying down low on the bole of the next tree.

Pika - Found in areas where the rock or lava is broken up, often in a form called talus, where there are many nooks and crannies for the pika within the pile of rocks.

Rosy Finch - Rare, but regular. Builds a nest of various vegetative materials in the side of a large rock or on the ground next to other rocks. To find this bird, you usually have to hike to areas above timberline.

Sources of Additional Information

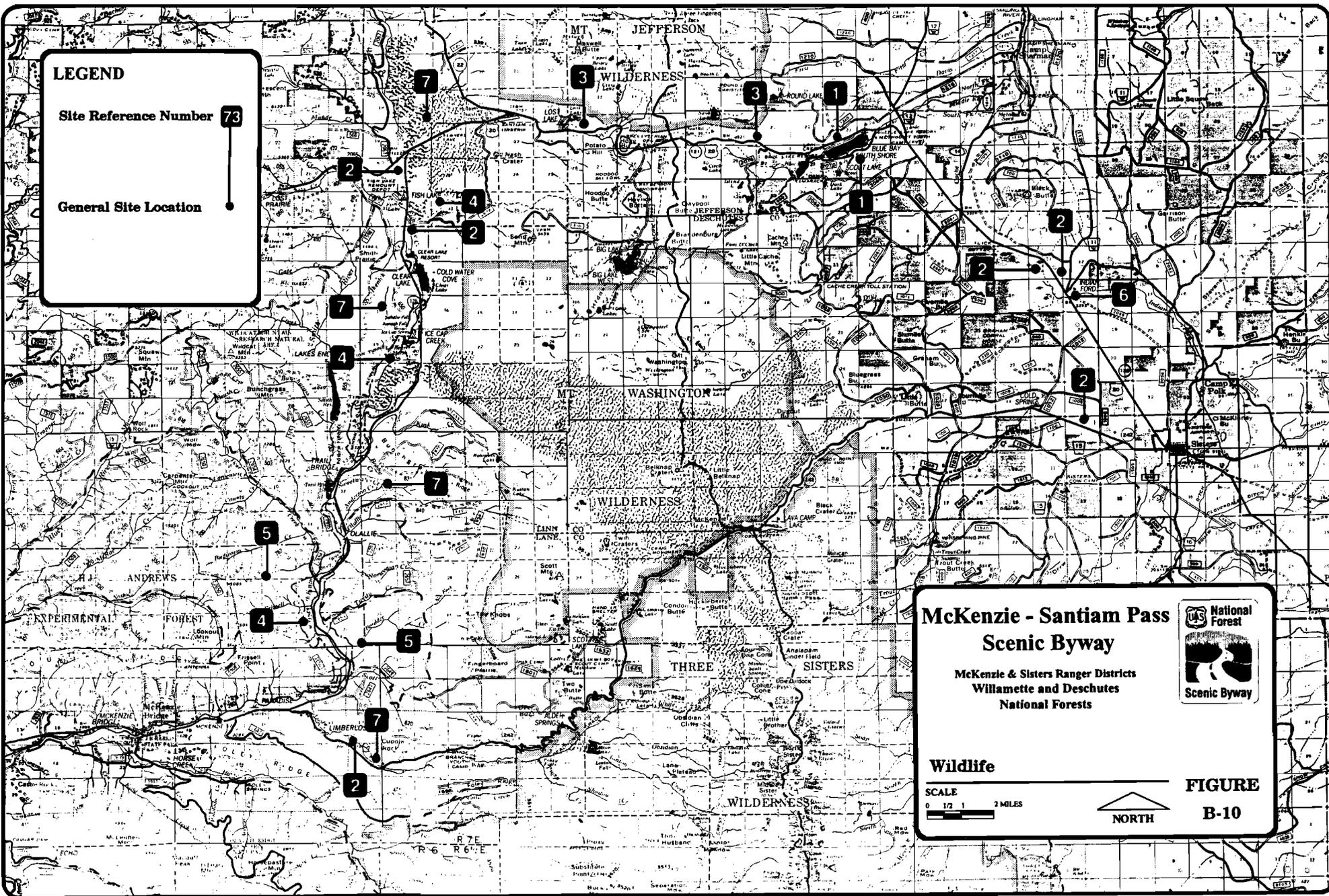
Land and Resource Management Plan and Environmental Impact Statement, Willamette National Forest, Eugene, Oregon, 1990.

Land and Resource Management Plan and Environmental Impact Statement, Deschutes National Forest, Bend, Oregon, 1990.

LEGEND

Site Reference Number **73**

General Site Location

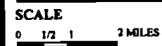


**McKenzie - Santiam Pass
Scenic Byway**

McKenzie & Sisters Ranger Districts
Willamette and Deschutes
National Forests



Wildlife



**FIGURE
B-10**

INSECTS AND DISEASE

Description

Insects and diseases play an important role in the ecosystems of the Scenic Byway. Insects provide food for other insects, animals, and fish and also act as plant pollinators. Many insects and disease relationships in forest ecosystems contribute directly to the carbon and nutrient recycling process in dead plant residue and to the development of the soils organic layers.

Insects and disease, from a commercial perspective, may have negative impacts on stands of trees. However, they are beneficial to the overall health of forest ecosystems. Younger, vigorous trees are more resistant to damage from insects and disease while mature or old growth trees tend to have the greatest incidence of disease.

Historically, overall tree mortality within the Scenic Byway from insects and disease has been moderate. However, scattered outbreaks with tree damage have occurred, usually following fire or blowdown. In 1953 a portion of the Byway area was sprayed to control an outbreak of the Spruce Budworm. Insects, diseases, and their hosts have evolved together for centuries, each responding to changes in the other. Though antagonistic to individual plants, many insects and diseases are beneficial to the Forest ecosystem. They act as a natural and necessary component of the system as long as the system is in balance.

Insects, including bark beetles and wood borers, utilize fungi as their primary food base. They contribute directly to the dispersal and effectiveness of these decay organisms. In the process of eating the fungi, the insects ingest spores which sometimes survive passage through their digestive tracts (Witcamp, 1975). Tree pathogens, such as root-rotting fungi, are dispersed through the Forest ecosystem in this way.

Physical stress, such as lack of moisture, light, or nutrients, predisposes plants to invasion by insects and certain diseases or pathogens. Moisture stress reduces the tree's ability to combat insect attacks. Insects and disease that attack stressed trees can release the healthier and more resistant trees. The result is similar to a precommercial or commercial thinning.

The primary insects which affect trees in the area are: The Douglas fir bark beetle (*Dendroctonus pseudotsugae*); Mountain-pine beetle (*Dendroctonus ponderosae*); the Balsam woolly aphid (*Adelges piceae*); and the western spruce budworm (*Choristoneura occidentalis*). Douglas fir bark beetles are occasionally found in down Douglas fir timber. Mountain pine beetles occasionally kill pines that are weakened by white pine blister rust or poor or changing site conditions. Balsam woolly aphid damage may occasionally be found in the true firs, particularly Pacific silver fir. The western spruce budworm is native to the United States and occurs throughout the range of its primary hosts, the true firs and Douglas fir.

In many instances birds regulate insect populations locally (Buke, 1974). Pileated woodpeckers forage for carpenter ants and termites that invade the heartwood of trees, while sapsuckers and hairy woodpeckers prey on larvae and pupae in the cambium layer. Adult bark beetles, spiders, and ants are pursued by other insectivorous birds such as the brown creeper and white-breasted nuthatch (Evans and Conner, 1979). These birds, bats, other small mammals, and microbes help hold insect populations at non-damaging levels or exert some control during early stages of outbreak.

The gypsy moth has not been proven to be a major defoliator of Douglas fir; its greatest impact is on south aspects where oaks and other hardwood brush is abundant. On these habitats it has shown the ability to build up to high population levels and is suspected of defoliating minor amounts of needles of Douglas fir along with the hardwood species (Miller, personal communication, 1986).

All of the diseases that attack timber species in the Douglas fir region are present in the area. Much of the old growth timber has heavy defect from butt and trunk rots. Root rots often weaken trees, making them subject to windthrow. Dwarf mistletoe causes considerable damage, loss of growth, and occasional death in hemlock and true fir stands. White pine blister rust is prevalent in western white pine.

As older stands are harvested losses due to defect will be reduced. The greatest disease losses in regenerated stands are caused by pockets of root rots, such as *Armillaria mellea* root disease, *Phellinus weirii* root rot, and *Ceratocystis wageneri* black stain root disease. Black stain root disease can be spread by bark beetles and weevils which pick up the fungus while feeding on infested trees and transfer it to other trees.

Current tree management and silviculture systems provide methods of control of insects and disease. Losses can be minimized by scheduling thinning treatments seasonally, when insects are inactive, and during warm periods. This allows stumps to dry out and become less attractive to beetles or weevils.

Major outbreaks of insects or diseases are unpredictable and perpetuation of some of these diseases is inevitable. Insects will cause damage in isolated areas and will probably be recurrent on cone crops. Current tree management and silviculture systems will continue to be used as long as they prove effective in resource protection.

Interpretive Opportunities

The visible affects of forest insects and diseases within the Scenic Byway provides an opportunity to educate and broaden the publics awareness and understanding of the natural processes of forest development. Following is a list of the types of insect or disease infestations that offer interpretive opportunities. Of these insect or disease infestations found within the Byway, the Western spruce budworm infestation in the Santiam Pass area is the most visible and offers an immediate opportunity for interpretation of forest health issues.

1. Douglas fir bark beetle (*Dendroctonus pseudotsugae*)
2. Mountain pine beetle (*Dendroctonus ponderosae*)
3. Balsam wooley aphid (*Adelges piceae*)
4. *Armillaria mellea* root disease

5. *Phellinus weirii* root rot
6. *Ceratocystis wageneri* black stain root disease
7. *Choristoneura occidentalis* western spruce budworm

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Sources of Additional Information

Land and Resource Management Plan and Environmental Impact Statement, Willamette National Forest, Eugene, Oregon, 1990.

Land and Resource Management Plan and Environmental Impact Statement, Deschutes National Forest, Bend, Oregon, 1990.

Budworm Position Paper written by Andris Eglitis, Entomologist, Deschutes National Forest, Sept., 1990.

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CULTURAL HISTORY

Description

Human use of lands and resources in and around the Scenic Byway extends over an estimated 8,000 years. Previous American Indian inhabitants within, or adjacent to, the Byway at the time of historic contact include the Molala, Kalapuya, Tenino, and Northern Paiute. Legend among the central Willamette Valley tribes held that a fierce battle occurred between the Molalla Indians of the west hills and the Paiutes from the east side of the mountains. The battle was along an old trail. The souls of the dead warriors waited to make war on old enemies along both sides of the trail, which formed a natural pass up the Santiam. When white men began to use the pass, they noticed that the indian trails bypassed gorges where the souls waited.

Evidence of past human use of the land and resources along the Scenic Byway is found in prehistoric (American Indian) and historical sites within the area. These sites, along with scattered artifacts, make up the cultural history from which information can be learned about former ways of life in this setting of the Oregon Cascades.

The Molalla and the Kalapuya peoples wintered at sites along streams in the lower elevations of the Western Cascades and traveled to the higher elevations to hunt game, gather wild plant foods, and to collect toolstone (obsidian) and other necessities of primitive life. American Indian sites documented throughout the area include toolstone quarry, habitation sites and seasonal camps, trails, food gathering areas, peeled bark trees, rock shelters, and religious sites (Minor et al., 1987).

Euro-American settlers, miners, trappers, and loggers have used lands and resources of the area since the 1800s. Remnants of the historic Euro-American use (1805-1910) include trails, wagon roads, railroad grades, homesteads, cabins, sheep camps, and mines. The physical remains of early Forest Service administrative sites (1910-1940) include cabins, guard and Ranger Stations, trails, lookouts, and Civilian Conservation Corps (CCC) recreation and administrative structures.

Many prehistoric and historic sites have been lost or degraded due to environmental processes including weathering, erosion, tree fall, and fire. Historic buildings and structures are affected by weathering, insect infestation, moisture, and fire. Archaeological sites are affected by erosion and natural weathering.

Past experience has shown that an area's cultural history, including its artifacts, can also be lost directly through development of campgrounds and trail construction and logging and road construction. History can be lost indirectly through improving access, which increases potential for vandalism and artifact theft. Occasionally, public use may result in the deliberate destruction of cultural properties through vandalism, relic collecting, theft, and carelessness.

The main protective measures used in the area have been to maintain the confidentiality of specific prehistoric site locations, to direct public use away from archaeological properties, and periodic monitoring of sensitive areas. Public education has been used to promote awareness and protection of prehistoric and historic sites.

A number of laws have been enacted to ensure the preservation of the Nation's cultural resources and history. The National Historic Preservation Act, as amended, directs that cultural resources on federal lands be inventoried and evaluated. Project inventory, and cultural site evaluations to determine National Register of Historic Places eligibility, and various kinds of investigations, includ-

ing archeological data recovery evaluations, are completed annually. To date, enhancement and interpretation of cultural resources has not been accomplished as a regularly scheduled activity.

The CCC-era administrative and recreational structures within the Scenic Byway are currently in the process of being nominated to the National Register of Historic Places. Included in this process are the Fish Lake Remount Station, Santiam Lodge, and White Branch Lodge. In addition, the historic Santiam Wagon Road is eligible for nomination to the National Register of Historic Places.

A chronology of dates and events of the Euro-American development of the Santiam Pass and McKenzie Pass areas is as follows:

General Chronology

- | | |
|-------------|---|
| 1825 (Aug.) | Hudson's Bay trapping party, headed by Finan McDonald, crossed from the North Santiam. |
| 1826 (July) | Peter Skene Ogden crossed with horses and mules and felt this was the best route for communication between Fort Vancouver and the "Clamuthe Country". |
| 1844-45 | Hudson's Bay Company quit using this route to the east, preferring the northern route past Mt. Hood. |
| 1846 | Active searching for a wagon road over the pass was done by Thomas McKay in August (looking up the South Santiam for a toll road from Albany to the valley of the Malhuer River), and Colonel Gilliam with Joseph Gervais as a guide looking up the North Santiam (Minto Pass). Both attempts failed. |
| 1862 (Oct.) | Oregon State Legislative Act provided for corporations and standards by which roads would be built under the Act's authority. The road was to be cleared to 30 feet in width, with a 16-foot track in the center (except at 6-foot cuts where it could narrow to 10 feet), and turnouts 16-feet in width every quarter of a mile. The same General Law states that right of ways shall not exceed 60 feet in width. |
| 1866 (July) | Congress granted land to the State of Oregon to construct a military wagon road from Albany, through Canyon City, to the eastern boundary of the state. The route would be the most feasible pass in the Cascade mountain range. |
| 1870 (July) | Congress passed an act amending the Act of July 1866 and changing the route to go by way of Camp Harney instead of Canyon City. |
| 1903 | General Laws for the State of Oregon declared all territorial roads to be county roads. |

Santiam Highway History

State Highway 126, U.S. Highway 20 - Also known as The Willamette Valley and Cascade Mountain Wagon Road, Cascade Mountain Military Road and the Santiam Toll Road.

- 1847 The State Legislature first authorized construction of a road across the Cascade Mountains by way of the Santiam River.
- 1859 (Sept.) While on a hunting trip, Andrew Wiley, accompanied by John Gray and John Brandenburgh discovered a route through the Cascades following the South Santiam River (known as "Wiley Pass").
- 1864 (March) The Willamette Valley and Cascade Mountain Wagon Road Company was incorporated with the objective of constructing and maintaining a wagon road over the Cascades along the South Fork of the Santiam River.
- 1864 (Aug.-
Sept.) A westerly route was surveyed by the Willamette Valley and Cascade Mountain Wagon Road Company, starting at the Deschutes River and then down the South Fork of the Santiam River for 80 miles.
- 1865 (Feb.) Road construction began on the Willamette Valley and Cascade Mountain Wagon Road. Army volunteers, crossing the pass to Camp Polk, helped out with construction. By the fall of 1865, the road was open across the Cascade summit.
- (April) A toll gate was erected near the John Gilliland residence, 3 miles east of Sweet Home. Mr. Gilliland became the gate keeper and superintendent of the new Santiam Toll Road.
- (Sept.) The Company then proposed a route that would run from Albany up the South Santiam River and over the Cascade Range to the Deschutes Valley. This route was to pass Black Butte, Camp Polk, and move on to the eastern boundary via Canyon City.
- (Oct.) The Oregon State Legislature granted the lands pledged to the state by Congress for the road construction to the Willamette Valley and Cascade Mountain Wagon Road Company.
- 1871 (Aug.) The company was sold to Alexander Weill, H. K. W. Clarke and T. Egerton Hogg. Weill and Clarke lived in San Francisco. Hogg evidently acted as their agent in the purchase and did not acquire financial equity in either the lands or the road. Hogg's interest was in seeking financing for building a section of railroad from Corvallis, up the North Santiam and across Central Oregon to Ontario. A short section of the railroad was actually constructed on the Santiam Divide in 1889 and made operational to preserve his rights to the land grants.
- 1878 Although Camp Polk was originally the next stopping place after Cache Creek along the Santiam Toll Road, an alternate route developed from Cache Creek, leading directly to the present townsite of Sisters.

- 1880 The tollgate along the Santiam was moved to a location 1 mile west of Lower Soda. John McKee became the new gate keeper.
- 1891 J. L. Nye was appointed gate keeper on the Santiam Toll Road. Traffic was heavy by this time, with hundreds of four- and six-horse wagon teams hauling wool from Eastern Oregon to the woolen mills on the west side of the Cascades. They hauled fruit, vegetables, and other supplies back over on the return trip. Thousands of horses, cattle, and sheep were driven over the Santiam route also.
- 1893 Frank Rumbaugh was appointed superintendent of the Santiam Toll Road.
- 1896 A 16-foot gate was erected on the east side of the Cascades at Cache Creek, 15 miles west of the town of Sisters. Robert Booth was the gate keeper.
- During the time the Cache Creek toll gate was in operation once-a-week mail carriers left Sisters at 6 a.m., rode horseback to Cache Creek, ate breakfast, changed horses, and rode to Fish Lake. Here they ate lunch, changed horses again and rode to Cascadia. They spent the night at Cascadia and rode back to Sisters the next day.
- 1897 There was considerable bridge repair needed along the road and A. J. McClure took over as superintendent.
- 1905 (June) Dwight B. Huss and his Oldsmobile "Old Scout" made the first crossing of the Cascade Mountains by an automobile.
- 1906 George Scott became gate keeper at the Cache Creek toll gate.
- 1912 John Brunz became gate keeper at the Cache Creek toll gate.
- 1925 Linn County bought all rights to the original roadbed and there were no more toll gates.
- 1939 Construction was completed of the road now called the Santiam Highway.

McKenzie Pass Highway History

State Highway 242 - Also known as The McKenzie Salt Springs and Deschutes Wagon Road, and State 28 for awhile.

- 1859 H. H. Spaulding, Jake Gulliford, and Stafford and Compton drove cattle over the Cascade Mountains along the McKenzie route.
- 1862 (Oct.) Felix Scott Jr. (a businessman from Eugene City) and his brother Marion, opened a wagon road through the McKenzie Pass to supply cattle to miners in Idaho. This was the first known crossing of wagons through the Santiam Pass - McKenzie Pass area.

This crossing was known as the Scott Trail. It went east up the McKenzie river to Belknap Springs (earlier known as Salt Springs), with a sharp upgrade along Scott Creek to Fingerboard Prairie and south of Scott Lake. Then, skirting the summit lava flows and passing south of Black Crater, it followed an old Indian trail to Sisters.

- 1866 John Craig, a member of Scott's original crew, explored through the lava fields in search of a better and lower elevation route across the McKenzie Pass. Between 1862 and 1871 several construction companies tried various routes but all except Craig failed.
- 1871 John Craig settled at Craig's Bridge, now the town of McKenzie Bridge, and formed the McKenzie Salt Springs and Deschutes Wagon Road Company. The company was incorporated with John Craig as president, and construction began on the new route.
- 1872 Craig's road opened and was lower in elevation by 1,000 feet. The toll road bypassed the Scott Trail by crossing lava beds.
- 1875 When the post office at Camp Polk began, a contract was let to carry the mail via this route from Eugene to Camp Polk and on to Prineville.
- 1877 Craig died carrying the Christmas mail over this route.
- 1898 The road became a free county road.
- 1917 The McKenzie route became part of the State Highway System.
- 1920 Serious development of the McKenzie Highway began in the early 1900s. Both the Cascade National Forest, in Lane County, and the Deschutes National Forest (1916), in Deschutes County, cooperated with the counties to provide for relocation and construction of the road known as the McKenzie Highway.

McKenzie River Highway History

State Highway 126 - Also known as the Clear Lake Cutoff.

- 1962 This section of highway was dedicated, connecting the McKenzie Pass and Santiam Highway.

Interpretive Opportunities

Prehistoric and historic resources within the McKenzie Pass - Santiam Pass National Scenic Byway offer many opportunities for the public to gain an awareness about the area's prehistoric peoples and an understanding of its historic past. Several interpretive opportunities are listed below and their corresponding locations are illustrated in Figure B-11.

1. **Belknap Springs Highway:** Belknap Springs Highway was the name for an old section of highway above McKenzie Bridge. This highway extended from the old McKenzie Highway at Belknap Junction to Belknap Springs and continued for several miles along the McKenzie River. In the early 1930s the CCC completed a Forest road from the end of Belknap Springs Highway to Clear Lake. See the Clear Lake Cutoff and Belknap Springs listings.
2. **Black Butte Lookout:** Black Butte has been used as a fire lookout since 1910. At that time, two tree platform lookouts were constructed on either side of the Butte. Another was built in 1919 between the trunks of four trees. In 1923, a cupola style lookout house was built and still stands on the summit. This is one of the few remaining of this style in the Northwest. In 1933 an 80-foot tower was built to provide better detection capability. It still stands and was used until 1990 as the primary lookout on the Sisters Ranger District.
3. **Brooks Scanlon Railroad Crossing:** This is the overpass used by the Brooks Scanlon Company to cross the McKenzie Highway with their logging railroad. The railroad logging in the Sisters area began in 1947. A similar crossing was located on the Santiam Highway near Indian Ford Campground, but was removed about 15 years ago. From this crossing, timber was cut from track laid between the McKenzie and Santiam Highways and from the Little Squaw Back areas.
4. **Cache Creek Guard Station:** This is an early guard station located about one-third mile downstream from the toll station. It was built of logs and is currently deteriorated.
5. **Cache Creek Toll Station:** This is the location of the Cache Creek Toll Station. This station was used to collect tolls from the late 1860s to the early 1900s. The site did contain a main house, barn, shed, and several other buildings. The collapsed main house is all that remains. These are made of logs covered with milled lumber.
6. **Carmen-Smith Project:** The Carmen-Smith project was designed by the Eugene Water and Electric Board (EWEB) for hydroelectric power generation on the upper McKenzie River. It includes Carmen Reservoir on the upper McKenzie above Tamolitch Falls; Carmen Diversion Tunnel, which diverts the McKenzie River from Carmen Reservoir to Smith River Reservoir; Smith River Reservoir; and Trail Bridge Reservoir.

The project planning started in 1957, after the Beaver Marsh Dam project was defeated by Eugene voters. Construction began in 1960, but near completion was delayed when cracks were found in the diversion tunnel. Repair of the tunnel took three weeks. The Carmen-Smith Project was dedicated Sept. 9, 1963, with about 1,800 people attending. Speakers at the dedication included Governor Mark O. Hatfield, Eugene Mayor Edwin E. Cone, Regional Forester J. Herbert Stone, and Federal Power Commission Regional Engineer M. Boyd Austin (Stone, 1986). See the listings for Beaver Marsh Dam and Clear Lake.

7. **Clear Lake Cutoff:** The Clear Lake Cutoff is a local name for a highway section that routes traffic from the McKenzie Pass Highway (Route 242) to the South Santiam Highway (U.S. 20), via the upper McKenzie River and Clear Lake. Construction of the Clear Lake Cutoff began in 1955 and it was officially named the McKenzie Highway (Route 126) when it was completed in 1962. The McKenzie Highway over the McKenzie Pass was renamed as a scenic route and assigned the Route 242 designation. Highway mileage above this point is marked by mile posts that decrease until the intersection with the South Santiam Highway (U.S. 20) 31.9 kilometers (19.8 miles) away.

The first road built along the route was in 1934. It was a crude truck trail built by the Civilian Conservation Corps (CCC) from Belknap Springs to Clear Lake. According to the USGS quadrangle maps, the lower portion of the cutoff was known as the Belknap Springs Highway prior to the construction of the new highway. When the new highway was almost finished the name of Aufderheide Highway was proposed by then State Treasurer (later Governor) Robert W. Straub, to honor Robert Aufderheide, a Forest Service employee who was instrumental in the construction of the new highway. The name was not accepted and this portion of the highway became commonly known as the Clear Lake Cutoff. See the McKenzie Pass Highway listing.

8. **Clear Lake Day-Use Area:** Clear Lake is a beautiful day trip destination from several communities in the Willamette Valley and east of the Cascade crest. Restoration of the area's CCC-era structures is currently in process and interpretive materials for on-site displays are being prepared.
9. **Craig Monument:** Craig Monument, located along the scenic McKenzie Pass Highway (Route 242), was erected to honor the memory of John Templeton Craig (1821-1877). He was born in Wooster, Ohio and came to Oregon in 1852, driving an ox team for his brother-in-law, Dill Ritchey. The following year Craig and Ritchey both settled along Camp Creek where they owned and operated a small whipsaw lumber mill. However, the two had disagreements and eventually split the partnership, with John leaving to work on the Rodney Scott homestead. In 1862 Craig was hired by Rodney's brother, Felix Scott Jr., to help with a cattle and wagon drive over the Cascade Mountains. This journey, which took all summer and fall, was the first major crossing of the McKenzie Pass.
10. **Cinder Beach Campground:** This campground contains several CCC-built structures. Originally it contained a registration booth, a fully plumbed rest room, a men's and a women's changing structure, and a community kitchen. One changing structure and the registration booth have been removed.
11. **Dee Wright Observatory:** The Dee Wright Observatory is just east of the summit of the McKenzie Pass (Route 242), at 124.7 kilometers (milepost 77.5). The observatory was built from lava rock during the Great Depression by the Civilian Conservation Corps Camp F-23, CCC Company 927, located at Camp Belknap. The observatory construction began in 1934 and was completed in 1935. After the lava house was constructed, a 9.1-centimeter (36-inch) bronze plaque was installed listing the names of the surrounding mountain peaks. The present observatory, which houses the new bronze peak finder and lava tube viewing holes, was named for Dee Wright (1872-1934), a Forest Service packer for 24 years. Already a popular destination or stopover, this would be a good location to discuss the role of the CCC in recreation development and present additional historic narrative on Dee Wright himself, an individual whose time spanned all the historic theme periods.
12. **Fish Lake Work Center:** Fish Lake Work Center (Remount Station) is a Forest Service administrative site on the northeastern shore of Fish Lake. The original Fish Lake Ranger Station land was withdrawn from potential homestead entry by the Forest Service for use as an administrative site on Nov. 17, 1906. It was used in conjunction with the nearby Lava Lake Ranger Station and the Smith Prairie Ranger Station sites.

According to a 1915 Forest Service report, this 8-hectare (20-acre) site was located midway between "...Lava Lake which furnishes an abundance of hay, and Smith Prairie, which furnish-

es pasture for horses used for official work....The W. V and C. M. wagon road (Willamette Valley and Cascade Mountain Wagon Road) runs through the tract....Needed as a summer headquarters for patrolmen, lookout and administrative men, as it is centrally located and the most accessible place." A portion has been used for many years as a public camping ground and is under special use permit, but this does not interfere with its use as an administrative site. This already has some interpretation. It is an ideal spot for more since all of the historic themes are represented there.

13. **Frog Camp (Hwy 242):** Prehistoric hunting/gathering (great place to interpret the obsidian resources and to present historic preservation messages, since its the main access into the Obsidian cliffs area).
14. **Hogg Rock:** Hogg Rock, a plug from an old volcano, forms a rocky point that towers over the surrounding region northwest of Hoodoo Butte, near the Santiam Pass. The rock is west of the Santiam Pass summit on Highway 20). The highway travels around the base of the western and southern faces of the point. A 1909 map of the Cascade National Forest shows the name as Cape Horn, while a 1913 map of the old Santiam National Forest has the name as Hog Back Butte, but these names have not persisted.

Hogg Rock was named for Colonel T. Egerton Hogg by J. I. Blair, who was associated with him in a railroad venture (Minto, 1903: 248). Hogg was involved in several efforts to extend a railroad from the Oregon coast to eastern Oregon and Idaho. A portion of the railroad grade ran north of the existing Santiam Highway location, from the Lost Lake area, and ended just east of Hogg Rock.

15. **Hoodoo Butte Ski Area:** The Hoodoo Butte Ski Area is located on the northeast side of Hoodoo Butte. The ski area, sometimes referred to as the Hoodoo Bowl, is located off Big Lake Road (Forest Road 2690). The beginnings of the Hoodoo Butte winter sports area happened in 1938. Expecting the completion of the North Santiam Highway to take place in 1939, the Forest Service moved to prepare for an anticipated rush of tourists and recreation users in the high Cascades. Other experiments in winter sports areas at Hand Lake and White Branch had been unsuccessful because of the lack of winter access and adequate depth of snow. However, the Santiam Pass area, with the new all-weather highway and higher elevation did not seem to have such problems.
16. **Indian Ford:** Indian Ford Creek was known locally as Slough Creek because of its marshy characteristics throughout its length. This made it difficult to cross. Originally the road was located around the north side of the creek to avoid a crossing. Later a safe crossing, one taken by an old Indian trail, was used and known as Indian Ford. The name has since been applied to the creek.
17. **Isham's Corral:** Isham's Corral (Ishom is a variant spelling) was near Alder Springs on the McKenzie Pass Highway (Route 242). Reports in the various Eugene newspapers of 1898 indicate that the stock corral was about 2.4 kilometers (1 1/2 miles) west of Alder Springs and about 28 meters (70 feet) south of the old McKenzie toll road. However, Ray Engles (1979) said that Smith Taylor showed him the location in the 1930s and that the corral was much closer to the springs, near the prominent bench mark rock at 104.4 kilometers (milepost 64.9), and about twice as far from the highway.

The corral was used to hold stock, such as sheep, cattle, and horses overnight when driving the animals up the Lost Creek Valley to the high mountain meadows or Eastern

Oregon. There was no water or feed available for the animals. The corral was constructed in 1895 by John Isham and his son Ira. They "...had cut long, slender (fir) poles and fenced in this tract of about 2 acres (4/5 hectacre) to rent to ranchers making the terrible trip across the mountains with herds of livestock." (Eugene Register-Guard, July 5, 1943)

18. **Lava Camp Lake Camp:** CCC-era shelter in campground.
19. **Limberlost Campground (Hwy 242 Segment):** Prehistoric hunting/gathering, transportation.
20. **Lost Creek Ranch:** Lost Creek Ranch was an old ranch site in Lost Creek Canyon "...at the foot of Dead Horse Hill (or Deadhorse Grade, and it was)...the first supply point (and Inn) west of Sisters" (Oregon Writers Project, 1940: 456). There are several stories about the settling of the Lost Creek Ranch. Maple Stobie (1969) reported that the ranch was first settled by Carey Thomson in 1886 (Stobie, 1969). Yet old Forest Service records show that the ranch was established in 1887. Finally, Martha Belknap (1979a) reported that W. H. Turman, who was related to the Belknap and Sims families of the Blue River and McKenzie Bridge area, homesteaded the Lost Creek Ranch around 1881.
21. **Lost Creek Ranger Station:** The Lost Creek Ranger Station was found along the old McKenzie Pass Highway (Route 242) at the Lost Creek Ranch site. In August 1907, the Forest Service decided to establish a ranger station at this location. The forest rangers on this project were W. H. B. Kent, Vernon V. Harpham, J. Roy Harvey, Wesley Kelso, and John D. Guthrie. They were given the job of dividing and clearing half of Mr. Turman's Lost Creek Ranch.

Old Forest Service records indicate that the ranger station area of some 27.5 hectares (68 acres) was administratively withdrawn on Oct. 26, 1908. The following year, Joseph Turman was paid \$400.00 for relinquishing part of his squatters ranch and improvements to the government. The ranger station, a two-room, one-story, frame building of 4.2 X 6.7 meters (14 X 22 feet), was constructed in 1909 for \$498.93. The site later served as a Forest Service packer or remount station. Apparently the Forest Service quit using the site by the 1940s. See the Lost Creek Ranch listing.

22. **McKenzie Pass:** The McKenzie Pass summit is located on the scenic McKenzie Pass Highway (Route 242) just west of the Dee Wright Observatory. The McKenzie Pass is named for the McKenzie River. Until the 1860s the pass in the upper McKenzie region was an Indian trail which was also used for driving cattle over the Cascades. Very few immigrants descended the McKenzie Pass because of the large and rugged lava flows and steep mountains that made wagon travel almost impossible. The few settlers who attempted to cross the lava flows usually had to abandon their wagons and complete their journey on foot.
23. **McKenzie Pass Highway:** The McKenzie Pass Highway (Route 242) has a long and varied history. The apparent discoverer of the McKenzie River, Donald Mackenzie (or McKenzie) may have made a trail up the river and traveled over the Cascade Range in 1812, but there is no evidence. The first recorded trip over the Cascades in this region was in 1853 by a group of emigrants on horseback who were lost in the mountainous area near the Three Sisters. They eventually traveled down the river to Springfield. These lost and weary travelers were part of the Elliot and McClure wagon train, which was the famous Lost Wagon Train of 1853 that came down the Willamette River. In the early 1900s construction of the highway was undertaken to allow for automobile travel. Prior to this time autos had to cross

using a corrugated road called "ladders". Several photos exist that show the "big cut" being excavated, the rock extraction and crushing at Windy Point, as well as the road passing through large snow drifts.

24. **McKenzie Salt Springs and Des Chutes Wagon Road:** The McKenzie Salt Springs and Des Chutes Wagon Road, commonly called the McKenzie Toll Road, was established in the late 1800s. The toll road began as a private venture to provide access from the Willamette Valley, over the Cascade Range at the McKenzie Pass, to the gold fields of Idaho. The idea for a toll road over the McKenzie Pass originated soon after the Felix Scott, Jr. party crossed the summit in 1862. On Dec. 20, 1862, Felix Scott, Jr., his brother Marion Scott, John Cogswell, John Powell, and S. Ellsworth filed articles of incorporation in Lane County for "The McKenzie Fork Wagon Road Company." The purpose was "to construct its said road from the eastern terminus of the county road near John Latta's (just east of Walterville) about 16 miles (25 kilometers) east of Eugene City, thence easterly along the nearest and best route across the Cascade mountains by way of Canon City to Auburn in Baker county." (Sawyer, 1932: 6)
25. **McKenzie Wagon Road and 1920s Road Construction Camp:** Just east of the Black Crater Trailhead and on the north side of the McKenzie Highway is an intact section of the old McKenzie Wagon Road. The wagon road descends the slope to the edge of the lava. A tree with the blaze "HK 1898" carved on it is located along the route to the lava flow. Along the edge of the lava is the remains of the road reconstruction workers camp. This consists of about 10 collapsed structures and dumps where tin cans are found. The camp was used in the early 1920s when the route was upgraded and rerouted in some areas.
26. **Santiam Pass:** The Santiam Pass is one of the major highway crossings of the Cascade Range. The pass, discovered in 1859 by Andrew Wiley, crosses the crest south of Mount Jefferson and north of the Three Sisters. The Santiam Pass was named "...for the Santiam Indians, a Kalapooian tribe, living near the Santiam River." The pass has been known by several names including Lakes Pass, Minto Pass, Hogg Pass, and Santiam Pass. In the 1860s, the "Santiam Pass was originally known as 'Lakes Pass' in honor of Fish, Clear, and Big Lakes by which the old (Santiam Wagon) road passed." (Clark, 1941: 1) Several photos exist showing the old road with wagons or automobiles, the toll stations, bridges, and planking used to cross areas of lava and sand.
27. **Santiam Ski Lodge:** The Santiam Ski Lodge is located at the top of the Santiam Pass near the Santiam Highway (U.S. 20). Initially the lodge was constructed to allow access to a winter sports area referred to as the Three Fingered Jack Area, just north of the lodge. This area, along with nearby Hoodoo Butte, was surveyed in the winter of 1938 by the Forest Service and interested citizens. The lodge, which is operated under a long-term Forest Service special use permit, "...was constructed in 1939-40 entirely with CCC labor (from the Marys Creek CCC Side Camp at Fish Lake) and funds, the product of President Franklin D. Roosevelt's famous movement to help the underprivileged youth of the Nation." It was, metaphorically speaking, hewn from the surrounding forest. (quote reference)
28. **Santiam Wagon Road:** The Santiam Wagon Road was officially known as the Willamette Valley and Cascade Mountain Wagon Road. It was a government-granted, privately owned toll road that began near Albany and traveled eastward over the Cascade Range to eastern Oregon. The wagon road was located along the old Wiley Trail, an old Indian trail that traveled over the natural pass that today is called the Santiam Pass. "Indians used this trail because, according to legend, they were afraid of 'Ambuscades' (ambush) if they went up the

River (Willamette National Forest II)." The history of the Santiam Wagon Road is long and varied. "The Willamette Valley and Cascade Mountain Wagon Road Company was organized in Lebanon on May 18, 1864, for the purpose of constructing a wagon road easterly across the Cascade Mountains to the Deschutes River, a distance of about 80 miles (128 kilometers). (reference)

This is where the current Santiam Highway crosses the route of the Willamette Valley Cascade Mountain Wagon Road. This wagon road was later known as the Santiam Wagon Road. This portion of the wagon road was used as the major route from 1865 to about 1905. In 1905, the town of Sisters was platted and soon the route was altered to pass through the growing community. The older route became a secondary road and is still used for logging and public access.

29. **Sawyers Cave:** Sawyers Cave is found a short distance west of the junction of the South Santiam Highway (U.S. 20) and the North Santiam Highway (Route 22). Sawyers Cave was discovered by, and named for, Robert W. Sawyer, a former Oregon State Highway Commissioner and editor of the Bend Bulletin. Sawyer wrote a letter to Lewis A. McArthur, describing the discovery of the cave: "Late in the fall of 1901 I went into the country north of Fish Lake, ostensibly deer hunting but actually in search of the lost One-Eyed Mike gold mine....I had with me provisions for a month. After fruitless search covering more than three weeks I began to explore in an area that I had been looking on as hopeless because of the extensive lava flow. On the second day of this part of the search a heavy snow storm came up and after it had continued for 24 hours it was apparent that I would have to spend the winter in that vicinity. It was too late to try to build a cabin so I found this cave. It is in two parts, leading away from a single opening, and in one part the bears of the vicinity were hibernating. I made my abode in the other part and whenever I needed fresh meat I simply, as it were, took it out of the refrigerator by killing one of the bears. My dislike of bear meat dates from this time." (reference)

30. **Scott Trail:** The Scott Trail was an old settler trail that began near the Rock House, east of Vida. The old trail went eastward to Scott Creek, followed an Indian trail along Scott Creek past Fingerboard Prairie, Melakwa Lake, Scott Lake, around the lava fields, over the summit, eastward to Trout Creek, and on to Boise. Scott Trail was named for Felix Scott, Jr. (1829-1879), who pioneered a wagon trail or road over the Cascades northeast of McKenzie Bridge. The route proved to be almost impassible for wagon travel.

Scott, Cogswell, and Craig formed a company in 1862 to build a more practical wagon road over the Cascade Range. The upper portion of the Scott Trail was maintained as a Forest Service Trail until the 1930s, but only the eastern-most section of the trail is maintained today. Many of the lower portions of the trail are now obliterated by the McKenzie Highway, forest roads, clear cuts, and brush. One almost intact portion of the old trail remains in the Scott Creek drainage, on the section called the Big Hill.

31. **Sisters Ranger Station:** This was the location of the original Sisters Ranger Station. It was used as the main office from the early 1900s to 1918. The office was moved into Sisters in 1918 and the buildings were used as storage and personnel housing. Some foundations are all that remain.
32. **Skyliners Ski Hill and Lodge:** This is the first location of the Skyliners ski area. It was developed in the 1920s by the Skyliners Club. The remains of a wooden ski jump litter the steep slope and some remains of the lodge can be found.

33. **Smith Prairie Ranger Station:** The Smith Prairie Ranger Station (R. S.) was located at Smith Prairie in the upper McKenzie Valley. It was along the old Smith Prairie Trail at 27.2 kilometers (milepost 16.9) from Belknap Springs (White and Stewart, 1936). This 97-hectare (240-acre) site was withdrawn from homesteading on Nov. 24, 1908 for use as a Forest Service ranger station. Smith Prairie R. S. was a two-room cabin 5.8 X 8.4 meters (14 X 28 feet) constructed in 1909 at a cost of \$300.00. The early forest rangers used this station for pasturing their horses while they cut hay at the nearby Lava Lake Ranger Station and stored it at Fish Lake Ranger Station. The administrative site withdrawal was reduced by 32.4 hectares (80 acres) in 1911, 16.2 hectares (40 acres) in 1913, and another 16.2 hectares (40 acres) in 1915.

Archie Odessa Knowles (1884-1959), a former Forest Service forest guard, supervised the building of the ranger station. Archie Knowles was the son of Albert P. and Lillian (Blackman) Knowles. He was reported to be the first white child born in the Mapleton area. In 1908 he married Margie Young, daughter of early forest ranger Carl and Mary (Blatchly) Young. Archie entered the Forest Service in 1908 and worked in the upper McKenzie and Santiam areas until he resigned in 1912. The cabin at the ranger station stood until it was crushed by the snow pack during the winter of 1912-13. The material from the flattened cabin was utilized for the construction of a new Forest Service house at Fish Lake. See the Fish Lake, Fish Lake Work Station, and Smith River Ranger Station listings.

34. **South Santiam Highway:** The South Santiam Highway begins in the central Willamette Valley at Albany, heads up the South Santiam River, crosses the Cascades at the Santiam Pass, and extends eastward to Ontario at the eastern edge of Oregon. On the west slope of the Cascades the highway passes through the communities of Albany, Lebanon, Sweet Home, Cascadia, and Upper Soda. The South Santiam Highway is joined by the McKenzie Highway near Fish Lake and by the North Santiam Highway at Santiam Junction. The highway continues eastward over the Santiam Pass to Idaho and beyond as part of the U.S. 20 Highway system.

The South Santiam Highway's history dates back to 1859 when Andrew Wiley and three other men explored the South Santiam River and the Cascade Range in hopes of finding a good route to Eastern Oregon and the gold fields of Idaho. They were successful and within a few years a federal land grant was given to the Willamette Valley and Cascade Mountain Wagon Road Company to construct a wagon road over the Cascades in the vicinity of Santiam Pass. By 1868 the company had built such a road, which everyone called the Santiam Wagon Road. They charged tolls for passage over the company road. By the 1890s there were hundreds of wagons, passengers, and cattle traveling over the toll road. In 1905 the first automobile crossed the wagon road.

35. **Suttle Lake Prehistoric Site:** This prehistoric site was discovered in 1986 during a compliance level survey for an interpretive center. The site was test excavated in 1989 and was found to be older than the layer of cinders from the eruption of Blue Lake (about 3,400 years old). The district is planning to interpret the prehistory of the site at the interpretive center.
36. **The Pines (Brooks Scanlon Railroad Logging Camp):** These are the buildings which housed the Brooks Scanlon workers. Similar camps were set up in many locales and were moved on flat cars when the timber in a particular area was completely logged. This camp was built in 1947 at the edge of Sisters and was used by the company for about 10 years. The Pines is the remains of these buildings. They are now used as rentals and residences. The Brooks Scanlon

Company discontinued the use of logging railroads and logging camps after 1957. These buildings remain as a last representative of this particular way of life.

37. **White Branch Youth Camp:** White Branch Youth Camp is a special use permit area in the Willamette National Forest. It was formerly a popular winter sports recreation area. The name derives from White Branch, the creek that flowed past the site. Access to the area is along the scenic McKenzie Pass Highway (Route 242) at 99.0 kilometers (milepost 61.9), between Limberlost Campground and Proxy Falls. During the winter months the state highway crews do not remove the snow from the highway past this point. During the winter of 1978-79, a winter road closure gate was installed across the McKenzie Pass Highway (Route 242) at this point.

The winter sports area, which was called Deer Butte Recreation Grounds, was built in 1934 by the CCC Company 927 at Camp Belknap under the supervision of the Forest Service. The recreation area was opened on Jan. 1, 1935, at 11 a.m. with some 1,500 people attending the dedication. The area included a 450-meter (1,500-foot) ski run, a long toboggan run, and several shorter runs (Six Twenty-Six, February, 1935). John Milliron, formerly of nearby Lost Creek Ranch and later at The Stockade, held a Forest Service special use permit from 1935 to 1940 to operate a lunch counter at the winter sports shelter at White Branch.

38. **Wiley Trail:** The Wiley Trail was the first white travel route over what is now the Santiam Pass. In September of 1859, Andrew Wiley and three other men blazed a trail that in part followed an older Indian trail over the Cascade Range. Andrew Wiley, Harvey Wiley, John Brandenburg, and John Gray were exploring eastward from the Willamette Valley when they became lost in the heavy forest east of Tombstone Summit near Lost Prairie. Andrew Wiley climbed a nearby mountain and became the first known white man to view the Santiam Pass from the western side.
39. **Windy Point Gold Rush:** A gold rush occurred at Windy Point in 1927. Reports of gold brought hundreds of prospectors into the area in September of that year. Over 500 claims were staked before the assays were shown to be fakes.
40. **Yale Junction:** Yale Junction was once an important highway junction located on the scenic McKenzie Pass Highway (route 242) above McKenzie Bridge. This highway junction was the beginning of the old Belknap Springs Highway which led to the Belknap Springs Resort and to Clear Lake. Thus, another name was Belknap Junction. The new Clear Lake Cutoff bypassed the junction and the bridge across Lost Creek has been removed. The old gasoline station and store are now just memories. The junction was named for the William "Bill" Yale (1861-1956) family who came to the upper McKenzie area in the late 1800s.

Sources of Additional Information

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Cultural Resources Overviews . . .

Photographic Files

RECREATION

Description

The Scenic Byway area offers a diversity of recreation settings that range from developed sites to Wilderness. These settings provide people the opportunity to pursue a wide range of recreational activities throughout the year. The most popular of these recreation activities within the Byway are camping, driving for pleasure, fishing, and boating-related activities. In the past these activities have represented approximately two-thirds of the total recreational use within the area. Next in popularity are swimming, picnicking, hiking, and resort use. During the winter months alpine and nordic skiing, snowmobile use, and other winter sports are prominent activities.

Access to recreation opportunities within the Byway is provided by three highways: U.S. Highway 20, State Highway 126, and State Highway 242. From these highways, several Forest roads and numerous trails branch out to many points of interest and recreation opportunities located adjacent to the Byway route.

Recreation Opportunities

The range of recreation opportunities available within the Scenic Byway area are composed of both developed sites and facilities, and dispersed areas, including highways and forest roads.

Developed Recreation: Developed recreation opportunities are provided through physical changes of environmental settings to accommodate specific uses or activities. Opportunities are provided from an array of developed sites that vary widely in their degree of environmental modification and development and in the kind of activities they accommodate. Sites range from downhill ski areas, to campgrounds where facilities are provided for the convenience and comfort of users, to primitive campsites where environmental modification is minimal and facilities are provided only for the protection of basic resources. . .

Existing opportunities for developed recreation are available from numerous Forest Service managed sites and several sites managed by the private sector under Forest Service special use permits. In addition several privately owned and operated resort facilities occur within the Byway. These are listed in Tables B-1 and B-2 and their locations are illustrated in Figure B-12.

Table B-1 - EXISTING DEVELOPED SITES¹

Deschutes National Forest

Site Name		Facility Type and Site Activities								
		RS	CG	PG	IO	BL	SW	FI	PS	TR
1.	Black Butte Ranch	X								
2.	Blue Bay Campground		X			X		X	X	X
3.	Blue Lake Sno-Park									X
4.	Blue Lake Private Resort	X								
5.	Camp Davidson	X								
6.	Camp Sherman - Information				X					
7.	Camp Tamarack	X								
8.	Cold Springs Campground		X	X						
9.	Corbett Sno-Park									X
10.	Indian Ford Campground		X	X						
11.	Lava Camp Lake Campground		X					X	X	X
12.	Link Creek Campground		X			X		X	X	X
13.	Methodist Camp	X								
14.	Ponderosa	X								
15.	Scout Lake Campground		X	X			X			X
16.	Sisters - Pvt. RV Campground		X							
17.	Sisters Ranger Station				X					
18.	South Shore Campground		X			X		X		X
19.	Suttle Lake Resort-FS Permit	X								
20.	Suttle Lake PG			X				X		

¹ KEY: RS = Resort; CG = Campground; PG = Picnic Ground; IO = Information/Observation Site; BL = Boat Launch; SW = Swimming; FI = Fishing; PS = Pack and Saddle; TR = Trail

Table B-2 - EXISTING DEVELOPED SITES¹

Willamette National Forest

Site Name		Facility Type and Site Activities								
		RS	CG	PG	IO	BL	SW	FI	PS	TR
21.	Alder Springs			X						X
22.	Camp Melakwa - FS Permit	X								X
23.	Cold Water Cove Campground		X			X				X
24.	Clear Lake Resort	X						X		X
25.	Clear Lake Picnic Ground			X		X		X		X
26.	Dee Wright Observatory				X					X
27.	Fish Lake Campground		X				X	X		X
28.	Fish Lake Work Center				X					
29.	HooDoo Ski Bowl									X
30.	Ice Cap Creek Campground		X					X		X
31.	Ikenick Sno-Park									X
32.	Koosha Falls			X						X
33.	Lost Lake Campground		X					X		
34.	Limberlost Campground		X					X		X
35.	Little Nash Sno-Park									X
36.	McKenzie Ranger Station				X					
37.	Obsidian									X
38.	Olallie Campground		X			X		X		X
39.	Potato Hill Sno-Park									X
40.	Ray Benson Sno-Park									X
41.	Sahalie Falls		X							X
42.	Sawyer's Cave									X
43.	Scott Lake Campground		X				X	X		X
44.	Santiam Sno-Park									X
45.	Trail Bridge Campground		X			X		X		X
46.	White Branch Youth Camp	X	X							

¹ KEY: RS = Resort; CG = Campground; PG = Picnic Ground; IO = Information/Observation Site; BL = Boat Launch; SW = Swimming; FI = Fishing; PS = Pack and Saddle; TR = Trail

Dispersed Recreation: Dispersed recreation opportunities are available from nearly all lands within the Scenic Byway, including Wilderness, that are outside the area of a developed site. These opportunities are available from a spectrum of landscape settings that vary widely in the types of activities they accommodate and the kinds of recreation experience they provide. This spectrum of recreation opportunity settings establishes the context within which users may engage in such activities as fishing, hiking, horseback riding, hunting, off-road vehicle (ORV) use, nordic skiing, driving for pleasure, gathering Forest products, and nature study. The recreation settings within which these activities typically occur are identified through the use of specific criteria, such as size of area, remoteness, and degree of naturalness. The criteria are used to identify the location and extent of these recreation settings in the forest landscape.

Each of the Recreation Opportunity Settings (ROS) within the Byway is described below and their distribution throughout the Scenic Byway is illustrated on Figure B-13.

Opportunity Settings

Primitive: Area is characterized by essentially unmodified natural environment of fairly large size. Interactions between users is very low and evidence of other users is minimal. The area is managed to be essentially free from evidence of human-induced restrictions and controls. Motorized use within the area is not permitted. Extremely high probability of experiencing isolation from the sights and sounds of humans. Independence, closeness to nature, tranquility, and self-reliance through the application of outdoor skills in an environment that offers a high degree of challenge and risk.

Semiprimitive Nonmotorized: Area is characterized by a predominately natural or natural-appearing environment of moderate-to-large size. Interaction between users is low, but there is some evidence of other users. The area is managed in such a way that minimum on-site controls and restrictions may be present, but are subtle. High probability of experiencing solitude, closeness to nature, tranquility, self reliance, challenge, and risk. Access and travel is nonmotorized on trails, primitive roads, or cross country. Vegetative alterations and sanitation salvage units are very small in size and few in number, widely dispersed, and not obvious. No on-site facilities available except limited signing, sanitary, and safety needs in native or rustic materials. Minimal to no site modifications. Interpretation through self discovery. Some use of maps, brochures, and guide books.

Semiprimitive Motorized: Area is characterized by a predominately natural or natural-appearing environment of moderate-to-large size. Concentration of users is low, but there is often evidence of other users. The area is managed in such a way that minimum on-site controls and restrictions may be present, but are subtle. Motorized use is permitted. Moderate opportunity for solitude, tranquility, and closeness to nature. High degree of self reliance, challenge, and risk in using motorized equipment. Vegetation alterations are small in size and few in number, widely dispersed, and not obvious. Limited facilities for sanitary and safety needs, signing in native or rustic materials. Minimal site modification for facilities. Interpretation through very limited on-site facilities. Use of maps, brochures, and guide books.

Roaded Natural: This setting is characterized by a predominately natural-appearing environment. Interaction between users may be low to moderate, but with evidence of other users prevalent. Resource modification and utilization practices are evident, but harmonize with the natural environment. Conventional motorized use is provided for in construction standards and design of facilities. Opportunity to affiliate with other users in developed sites but with some chance for privacy. Self reliance on outdoor skills of only moderate importance. Little challenge and risk. Some obvious on-site control of users. Access and travel is conventional motorized including sedan and trailers, RVs, and some motor homes. Moderate site modification and amount and complexity of facilities for

comfort and convenience of user. Interpretation through wayside exhibits. Use of primarily native-like or rustic material with some refinement in design. Some casual interpretation from Forest staff.

Roaded Modified: This setting is characterized by substantially modified natural environment. Resource modification and utilization practices are to enhance specific recreation activities and to maintain vegetative cover and soil. Sights and sounds of humans are readily evident, and the interaction between users is low. Facilities may be provided for special activities. Moderate densities of use are provided for away from developed sites. Opportunity to get away from others but with easy access. Feeling of independence and freedom but with little challenge and risk. Substantially modified natural environment where roads, landings, slash, and debris may be strongly dominant from within, yet remain subordinate from distant sensitive roads and highways. Conventional motorized access including sedan and trailers, RVs, and motor bikes. Little on-site controls of users except for some gated roads. No on-site facilities except signing at major road junctions and occasional sanitary facilities for user health protection. Interpretation by simple wayside signs of native or rustic materials may be provided.

Wild and Scenic Rivers: The Byway provides for a variety of dispersed recreation activities within the designated McKenzie Wild and Scenic River. The McKenzie River, from Clear Lake to Scott Creek, is designated as a Recreation River. The river corridor provides for extensive hiking opportunities along the McKenzie River National Recreation Trail, dispersed and developed site camping, white water boating, fishing, hunting, and other natural resource appreciative activities. A portion of the McKenzie River within the Byway, downstream from Scott Creek, is also designated as a State Scenic Waterway.

Trails: The trail system within the Byway is the basic off-road facility that dispersed recreationists, such as hikers, horseback riders, hunters, and motorized trail bike and mountain bike enthusiasts utilize to access and traverse areas adjacent to the Byway route. This system includes an extensive network of trails that access Wilderness, Wild and Scenic Rivers, general dispersed recreation areas, and connects various developed sites and points of interest. Included in this trail network are two National Recreation Trails; including the McKenzie River Trail and the Lava River Trail; and portions of the Pacific Crest National Scenic Trail. The location and extent of non-Wilderness trails within the Byway are illustrated in Figures B-14.

Off-Road Vehicles: Off-road vehicle use opportunities are also available within the Byway. However, several areas are closed to motorized use throughout the year, including Wilderness, Wild and Scenic Rivers, Semiprimitive Non-Motorized Recreation Areas, sensitive wildlife habitats, and special feature areas. Several areas are specifically provided to emphasize motorized use within the Byway, including a large area south of Highway 20 in the Santiam Pass area. This area is generally referred to as the Santiam Pass Dispersed Motorized Recreation Area. ORV use opportunities are generally available within Management Areas that provide Roded Modified, Roded Natural, and Semiprimitive Motorized recreation opportunities. However, some of the area identified as available for motorized access within the Byway area may not be desirable for certain types of ORV use due to slope, dramatic terrain variations, vegetation density, or lack of trail access. Area closures or restrictions of ORV use within the Byway are due to topography, safety, potential disruption of wildlife habitats, damage to basic natural and cultural resources, or conflicts with other existing uses.

Recreation Activities

Visitors from many Oregon counties, other states, and even other nations are attracted to this area of the Cascade Range. The recreation use of these visitors to the Byway area is split quite evenly between developed sites and dispersed areas (including Wilderness). The wide variety of sites and settings available within the Byway provide a diversity of opportunities for all visitors to participate in many different activities and to pursue meaningful recreational experiences.

Most (80 percent) of the camping that occurs within the Byway takes place in developed campgrounds. The most popular campgrounds within the area include Coldwater Cove, Ice Cap Creek, Big Lake, Cold Springs, Indian Ford, and the Suttle Lake-Blue Lake sites. However, dispersed camping along rivers, streams, and lakes is a popular activity. Driving for pleasure and sightseeing are also significant activities along this route as it passes through the high mountain passes of the Cascade Range.

Some of the reservoirs and lakes within the Byway are popular for both boating and swimming use during summer months. Lakes within the area that receive heavy use include Big Lake, Clear Lake, Lost Lake, Blue Lake, Suttle Lake, and Scout Lake.

Fishing use within the Byway is divided almost equally between lakes and reservoirs, and rivers and streams. The heaviest river and stream use occurs on the Metolius River on the Sisters Ranger District and the McKenzie River on the McKenzie Ranger District. Lake and reservoir fishing use is heaviest on Blue Lake, Suttle Lake, Big Lake, and Trailbridge Reservoir.

A majority of the hiking that occurs within the Byway area takes place on the existing trail system. Two-thirds of this use is associated with Wilderness travel. Off-trail or cross-country hiking accounts for about 20 percent of all hiking use within the Byway area. Of the trails outside of Wilderness, the McKenzie River National Recreation Trail receives the greatest amount of use.

An emerging dispersed recreation activity within the Scenic Byway, and elsewhere, is mountain bike use. Mountain bike enthusiasts are becoming organized as a group with a desire to cooperate in identifying mountain bike use opportunities within the area. Bicycle touring is also a popular activity on the Byway. Throughout the summer months cyclists can be seen traversing the Cascade Range over both the McKenzie Pass and the Santiam Pass.

Hunting is a longstanding recreational activity within the area. A majority of the use attributed to this activity is spent in the pursuit of deer and elk. The remainder of hunting use is for small game, upland birds, and waterfowl.

Many other recreational activities that take place within the Byway occur at specialized developed sites. These include picnicking, resort use, downhill skiing, and visitor information services. In addition, an increasing amount of cross-country skiing is taking place at facilities specifically developed for this activity. Other activities such as horseback riding, nature study, mountain climbing, and gathering Forest products occur primarily in dispersed areas within the Byway.

Future recreation use within the Byway will likely be affected by changes in various socio-economic indicators (e.g., population growth, disposable income, leisure time), the availability of opportunities, technology, weather conditions, and other variables. Due to uncertainties about the variables affecting future use, estimates become less reliable as they are extended into the future. Studies which have projected future growth for recreation cannot anticipate fluctuations in microclimatic weather

patterns nor predict regional energy shortages or economic recession. Therefore, estimates of future use generally assume that an underlying demand is present and will increase with a growing population that has an ever-increasing awareness and appreciation of recreation values.

Based on these factors, general trends in past use in both the Willamette and Deschutes National Forests and current efforts to diversify local economies with an emphasis toward tourism and recreation, it seems appropriate to assume that future participation in all activities within the area of the Scenic Byway will increase as long as opportunities are provided. The average annual growth rates for recreation activities within the Byway are expected to approximate those rates utilized in the development of Forest Plans.

Interpretive Opportunities

The developed facilities and natural resources within the McKenzie Pass - Santiam Pass National Scenic Byway offer many opportunities for the public to obtain satisfying recreation experiences. In addition, many opportunities exist for further development and interpretation of the area's natural and cultural history in a manner that enhances the overall experience of Forest visitors. Picnicking and camping is provided at several areas along the Byway. On the Deschutes National Forest, all need vegetation evaluations and completed cultural resource surveys prior to any further development. Several site development opportunities to enhance recreation use and to interpret Forest resources and history are listed below and their corresponding locations are illustrated in Figure B-15.

1. **West Portal**
Information, orientation, and interpretation structure with toilets and parking areas.
2. **Limberlost**
Interpretation of Prehistoric hunting and gathering and transportation routes.
3. **Lost Creek Spring**
Picnic site and interpretive trail and connecting trailhead with parking area and toilet facilities.
4. **White Branch**
Sno-Park facility for cross-country skiing and snowmobile access to Byway, information parking, and toilet facilities.
5. **Sisters Viewpoint**
Roadside pull-off with interpretive signing for a major view of the Three Sisters.
6. **Proxy Falls**
Trailhead parking facility with toilets, information station, and traffic control measures.
7. **Lower Litton Lake**
Wilderness trailhead facility to define parking area and manage overuse.
8. **Alder Springs**
Picnic area/campground. Retain existing character and provide with toilet facilities, water, parking, and roadside pull-off for four vehicles.

9. **Dead Horse Grade**
Interpretation signing of the McKenzie Wagon Road crossing and vegetation changes along roadside pull-off.
10. **Obsidian**
Interpretation of prehistoric hunting and gathering culture and their obsidian sources.
11. **Scott Lake**
Viewpoint of Cascade Range and interpretive pull-off for signing of Scott Wagon Road and pioneer history.
12. **Scott Lake Campground**
Reconstruction of existing campground, trailhead, parking areas, and rehabilitation of an existing rock quarry and various access roads.
13. **Belknap Crater**
Belknap Crater viewpoint pull-off and interpretive signing of the area's geologic history.
14. **Craig's Grave Site**
Interpretive pull-off and signing of John Craig's life and grave site.
15. **PCNST Trailhead**
Reconstruction and signing of Pacific Crest National Scenic Trail access point and parking area.
16. **Dee Wright Observatory**
Major viewpoint and interpretive site in the Cascade Range of Oregon. Expanded and reorganized parking, toilet facilities, interpretive displays, and information signing.
17. **Belknap Springs**
Interpretive signing of the historic use, geologic aspect, and water quality attributes of the springs.
18. **River View**
River viewpoint and pull-off for interpretive signing of the river's fisheries, water quantity and quality factors, and its Wild and Scenic River status.
19. **Trail Bridge**
Roadside facility for interpretation signing of the Carmen-Smith hydroelectric development project.
20. **Trail Bridge Campground**
Redevelopment and expansion of the existing facility to include areas for RV camping with an emphasis on barrier free access to all activity areas.
21. **Tamolitch Valley**
Viewpoint, picnic ground, and trailhead, with interpretive signing, interpretive trail, parking, and toilets.

- 22. Clear Lake**
Historic restoration and interpretation of on-site materials and structures of CCC-era day-use site and picnic area.
- 23. Fish Lake**
Interpretation of unique species of cutthroat trout, hydrologic attributes of the lake and historic use, to include signing, parking needs.
- 24. Fish Lake Guard Station**
Restoration and interpretation of this historic wagon road-stage stop and Forest Service remount station and administrative site. Parking, interpretive displays and signing, and restoration of structures.
- 25. Sawyer's Ice Cave**
Interpretation of the site's geologic history, trail improvements, and parking.
- 26. Lost Lake**
Picnic ground, small boat launch site, and toilets.
- 27. Hogg Rock**
Interpretative pull-off and signing of the historic efforts to develop the Hogg Railroad connecting the Willamette Valley with Eastern Oregon over the Santiam Pass.
- 28. Cinder Beach Picnic Area**
The Cinder Beach area on Suttle Lake is an old CCC site. The existing flush toilet building and the picnic shelter are original CCC buildings. There is also an old dressing room that is a CCC building, but this is in poor condition. There is a potable water system as well as tables, fireplaces, and garbage pickup. The area is used primarily by windsurfers taking off from the beach and hikers taking the Suttle Lake Trail. The picnic area provides tables and standup grills with a good view of the lake.
- The facilities are in need of reconstruction with consideration for accessibility and upgrading of the facility. The old dressing room needs to be removed, possibly to the Fish Lake CCC Guard Station. The addition of a drinking fountain would be useful for the area. Refurbishing of the shelter and toilet buildings, and providing for operation and maintenance are the primary concerns here.
- 29. Scout Lake Picnic Area**
Scout Lake, near Suttle Lake, is a day-use swimming and picnicking lake. There are tables, standup grills, toilets, and potable water.
- The site could use some added capacity and better organization in the parking areas. An analysis of the P.A.O.T. should be done for the site. The addition of a staffed booth and fee collection for day use would be helpful. At least one toilet should be made accessible along with one to two picnic sites between the lake and reservation area.
- 30. Suttle Lake Picnic and Water Skiing Area**
This picnic site is located at the west end of the lake where there is a boat launch and dock. The site has picnic tables, potable water, garbage dumpsters, and day-use boat parking. The site needs to be evaluated for accessibility to the toilets, picnicking facilities, and boat dock. The site is gently sloping and would lend itself to a totally accessible facility.

There is an existing safety concern on the lake because of the tight radius for water skiing. The area is marked with buoys to differentiate between the ski area and fishing area. Overall it is not a pleasurable boating experience during the active weekends. The Oregon Marine Board could ban water skiing on the lake and add an overall 10 MPH boating speed limit to deal with the existing multiple use conflicts.

31. Indian Ford Picnic Area

To reach the Indian Ford picnic area you must drive through the campground. The area is lightly used, possibly because the access is not marked. The area is close to the Santiam Highway and noise is a factor. The site has tables, standup grills, garbage cans, and a hand pump with potable water. The toilet facilities are at the campground. Indian Ford Creek passes through the site.

Use of the site would probably increase if signing was added, starting at the Highway. The toilet facilities need to be evaluated for accessibility.

32. Cold Springs Picnic Area

The picnic area at Cold Springs Campground provides a rest room and tables; however, the hand pump does not work and the campground well does work. There is a short dirt path to the Spring, which flows in late spring and summer rather than early spring. The site is an exceptionally beautiful riparian area, including aspen groves, and bird watching sites. There is also a lava rock formation west of the campground that is actually a rock shelter.

The well needs to be redeveloped in the picnic area, and the toilets evaluated for accessibility. The existing tables are sufficient at this time.

33. Black Crater Trailhead

The Black Crater Trailhead services a wilderness trail that receives primarily day hiker use. The existing trailhead is inadequate. The parking area is too small and located in an unsafe position relative to sight distance and activities at the Windy Point pullout.

The current proposal (in the 1992-1994 CIP program) is to close the existing trailhead and move it to a new location southwest of Windy Point. There is an old stockpile site, with a short access road, that would provide sufficient and safer parking. This would have to be leveled off somewhat and graveled. The intent would be to provide no more than graveled trailhead parking and standard wilderness signing. When the trail is relocated to the new trailhead, the vista overlooking Windy Point should be considered as a possible spur trail.

34. Matthieu Lakes Trailhead

This trailhead is accessed by taking the Lava Camp Lake turnoff. This is a wilderness trailhead with stock holding facilities (box stalls).

The parking area needs to be leveled and the site could be evaluated as a possible accessible facility.

35. Metolius Mountain Bike Trail Crossings

The Metolius Mountain Bike Trail (in the 1991-1994 CIP program) will cross the Byway at two locations. One crossing will be under the Lake Creek Bridge. The other will require bike warning signs as it actually crosses the Byway near Black Butte.

36. **Metolius - Windigo Horse Trail Crossing**
Primarily a horse crossing at the Byway, this trail goes from Windigo Pass on the Crescent Ranger District, across the Bend Ranger District, to Sheep's Spring Horse Camp in the north portion of the Sisters Ranger District.
37. **Black Butte Trailhead**
This trail takes off from a parking lot at the end of Forest Road 1110 and traverses approximately 2 miles to the top of Black Butte. The trailhead needs to be evaluated based on capacity (existing relative to desired).
38. **Cold Springs Campground**
The campground at Cold Springs is a fee site, not heavily used, and seems to have adequate capacity. However, there are no accessible sites and the campground needs to be reconstructed in the future to accommodate larger vehicles. The rest room could be updated to a two-hole unisex SST facility. The site does not lend itself to a flush toilet system, but a compost toilet may be possible.
39. **Suttle Lake Campgrounds (Blue Bay, South Shore, Link Creek)**
Suttle Lake has three fee campgrounds with a total of 97 campsites. All three have drinking water, boat launching facilities, and access to the lake trail. The launching facilities at Blue Bay and South Shore need breakwaters constructed. None of the sites are considered accessible and all three campgrounds need to be evaluated for modernization relative to accessible campsites and toilets and accommodation of larger vehicles. Other items to consider for the Suttle Lake campgrounds would be a central amphitheater, shower facilities, and a waste water dump station.
40. **Indian Ford Campground**
Indian Ford Campground is not a destination campground and therefore is not as heavily used. The site is close to the highway and lies along Indian Ford Creek. The site needs to have the access road and camping spurs paved, the old hand pump replaced, and one more hand pump added. The site needs upgrading and accessible facilities added.
41. **Corbett Sno-Park**
The Sno-Park gets a great deal of use in the summer months as an overnight parking area for RVs and people wanting to use the toilet facility. A decision needs to be made to either lock the toilet in the summer and discourage use by not mentioning the toilet facility in brochures, or to install an accessible toilet and accept the use. Problems to be considered are the use by RVs and currently not being programmed for the related garbage and toilet cleanup.
42. **McKenzie Highway Winter Trails**
The Byway has a shared-use corridor (snowmobiles and nordic skiing) that runs along the McKenzie Highway from the snow gate to Dee Wright Observatory.
43. **Blue Lake Sno-Park**
The Blue Lake Trail drops over 1,000 feet in elevation from Blue Lake Sno-Park to Blue Lake and also connects to Suttle Lake.
44. **Black Butte Trail**
The trail should be mentioned in brochures or audio tapes as a good partial day hike with 360 degree views and historical sites.

45. **Cold Springs**
The area lends itself to development of an accessible interpretive loop trail that would possibly include bird viewing locations, the Spring, the rock shelter, and views of the aspens. Location of interpretive trails should take into consideration a sensitive plant species identified in the area.
46. **Black Crater Trail**
It should be mentioned in brochures or audio tapes that this is a good day hike with panoramic views of the Cascade Mountain Range.
47. **Metolius Mountain Bike Trail System**
This system should be mentioned in brochures and other recreation information for the Byway.
48. **Suttle Lake Campgrounds**
An amphitheater could be constructed for interpretive purposes, and located central to all three campgrounds.
49. **East Portal**
Information, orientation, and interpretive center for the Byway loop.

Sources of Additional Information

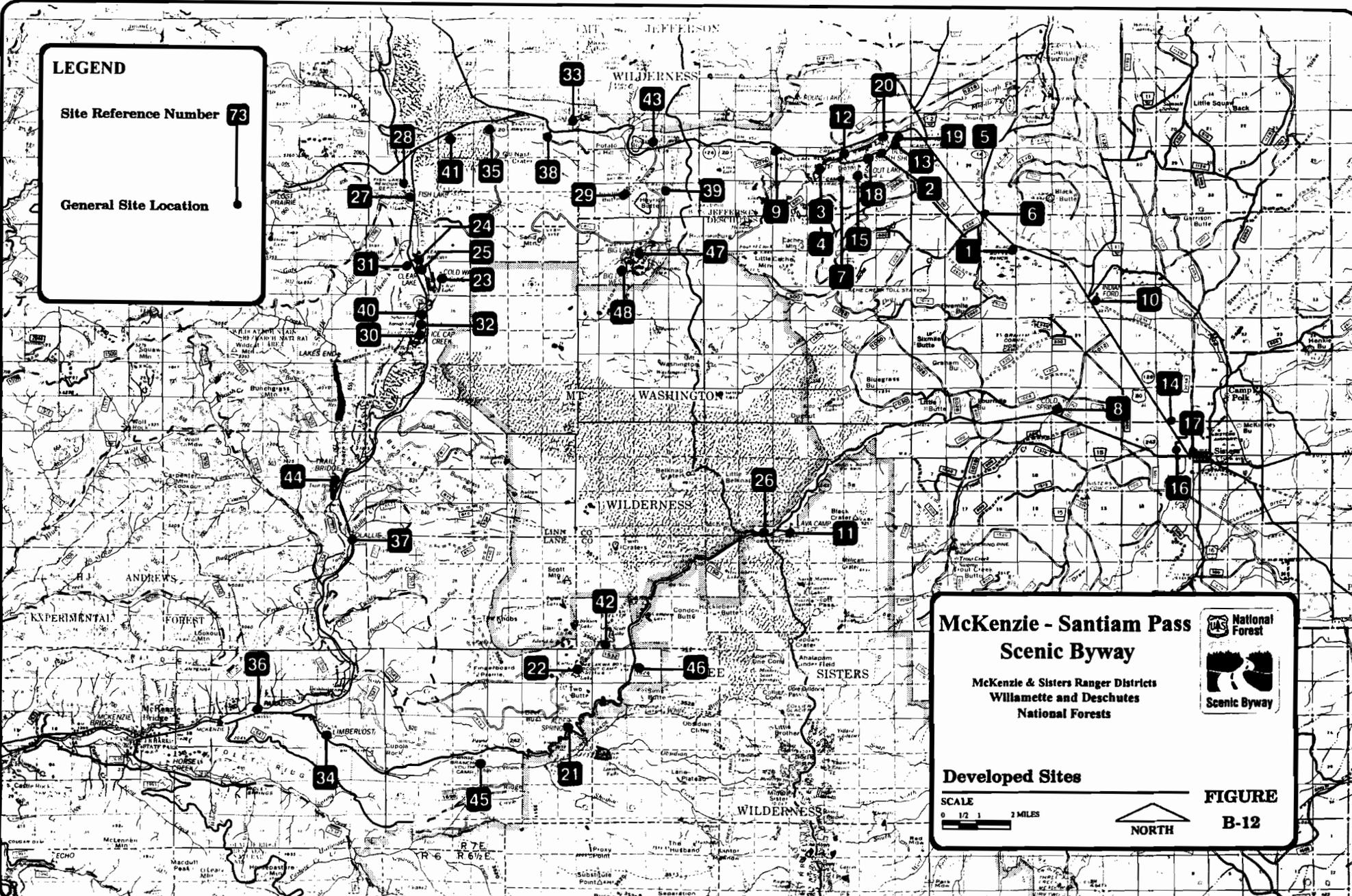
Land and Resource Management Plan and Environmental Impact Statement, Willamette National Forest, Eugene, Oregon, 1990.

Land and Resource Management Plan and Environmental Impact Statement, Deschutes National Forest, Bend, Oregon, 1990.

LEGEND

Site Reference Number **73**

General Site Location



**McKenzie - Santiam Pass
Scenic Byway**

McKenzie & Sisters Ranger Districts
Willamette and Deschutes
National Forests



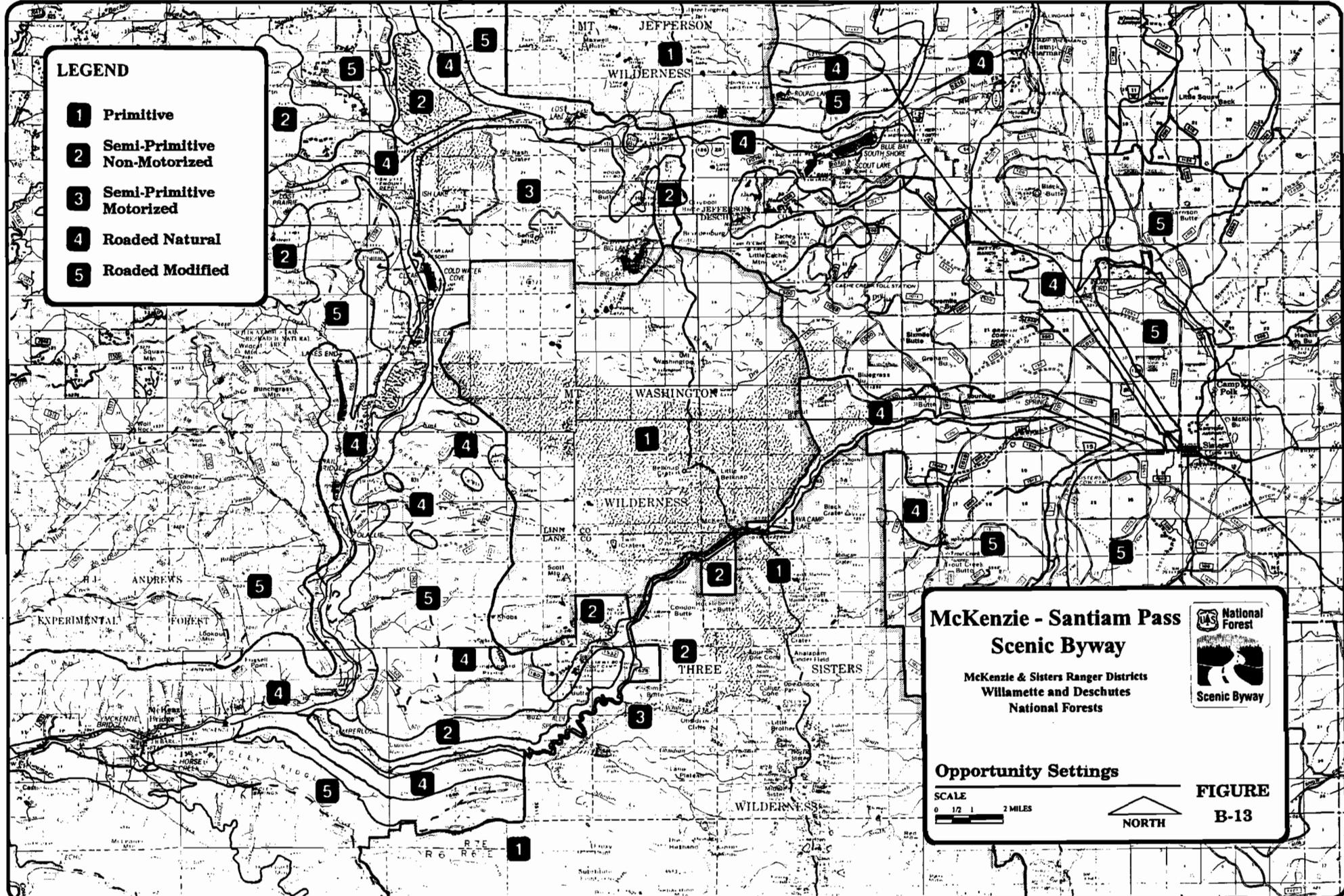
Developed Sites



**FIGURE
B-12**

LEGEND

- 1** Primitive
- 2** Semi-Primitive Non-Motorized
- 3** Semi-Primitive Motorized
- 4** Routed Natural
- 5** Routed Modified



**McKenzie - Santiam Pass
Scenic Byway**

McKenzie & Sisters Ranger Districts
Willamette and Deschutes
National Forests



Opportunity Settings

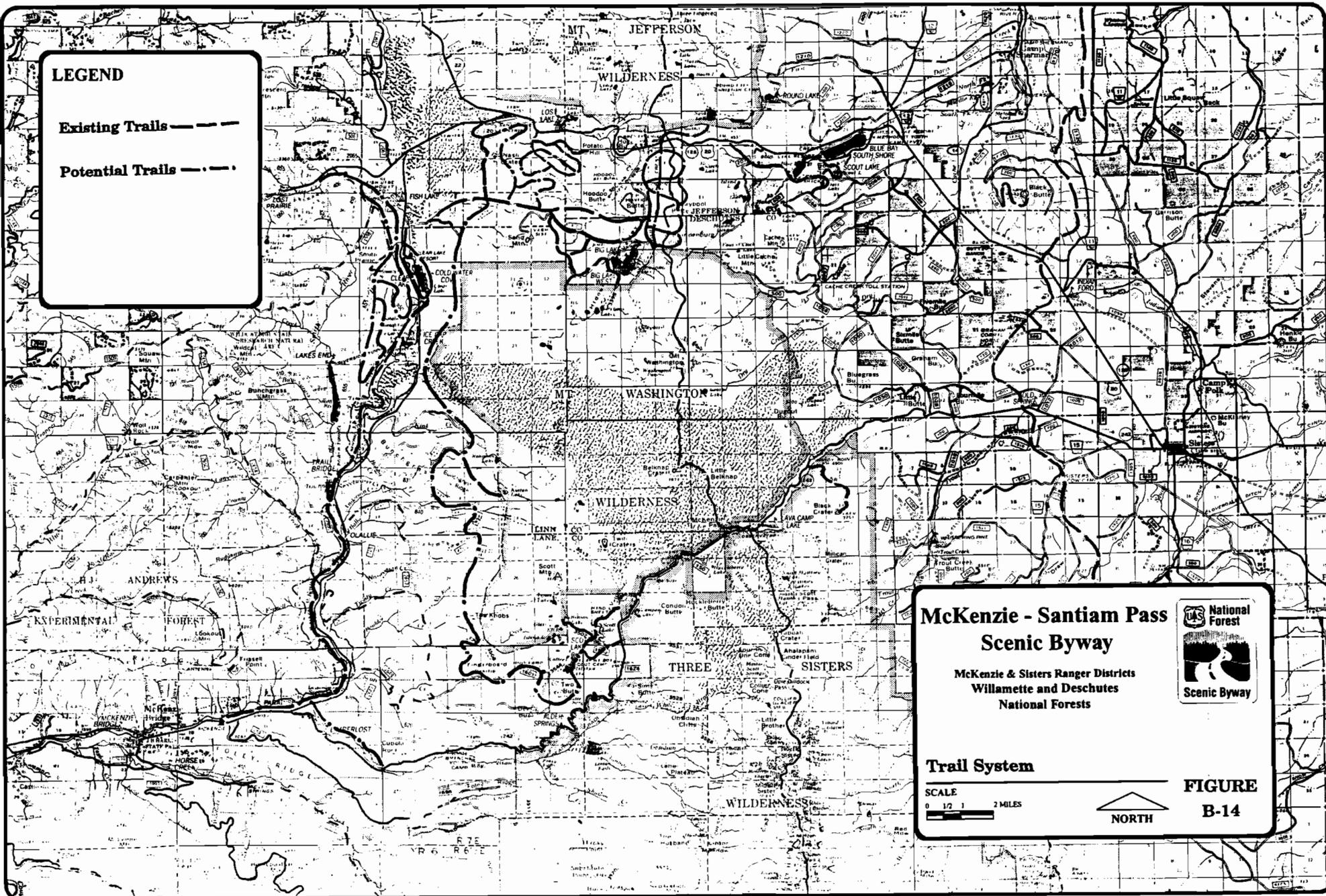


**FIGURE
B-13**

LEGEND

Existing Trails ———

Potential Trails - - - - -

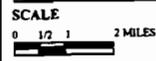


**McKenzie - Santiam Pass
Scenic Byway**

McKenzie & Sisters Ranger Districts
Willamette and Deschutes
National Forests



Trail System

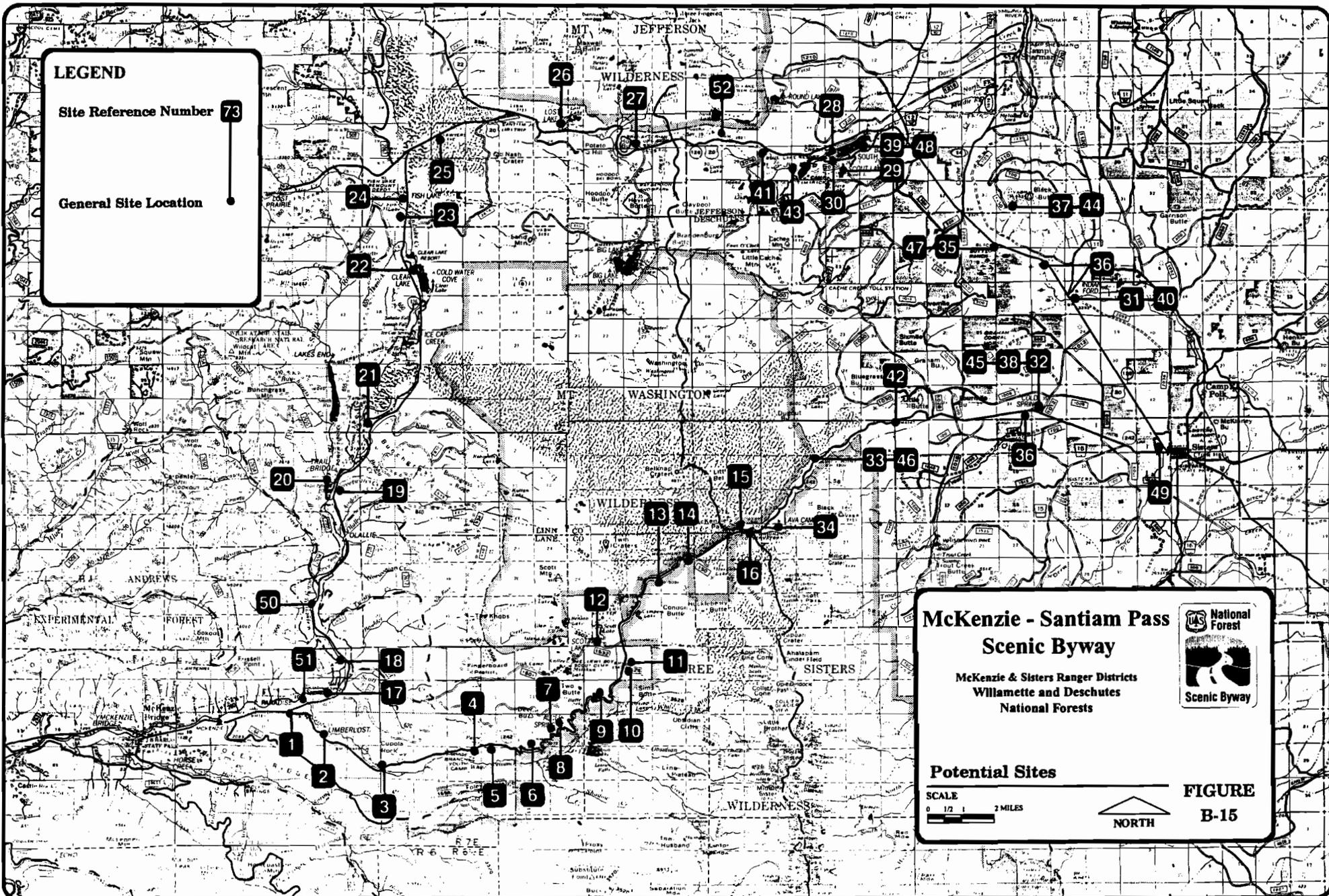


**FIGURE
B-14**

LEGEND

Site Reference Number **73**

General Site Location



**McKenzie - Santiam Pass
Scenic Byway**

McKenzie & Sisters Ranger Districts
Willamette and Deschutes
National Forests



Potential Sites

SCALE
0 1/2 1 2 MILES



**FIGURE
B-15**

SCENERY

Description

The McKenzie Pass - Santiam Pass Scenic Byway is a loop drive that has long been recognized by the USDA Forest Service and the general public as being one of the state's premier scenic and recreational highways. A significant segment of the McKenzie Highway portion (State Highway 242) of the Byway is also designated as a state Historic and Scenic Highway.

Recent Cascade mountain vulcanism, spectacular lakes, and vibrant fall colors draw thousands of visitors to the area each year. Since 1939 the McKenzie Highway portion has been maintained as a low-speed, highly scenic route that includes landscapes of Western Oregon, the High Cascades, and Central Oregon.

The portion of the Byway along U.S. Highway 20 provides outstanding scenery, with a forested environment offering contrast to the extensive lava flows seen along the McKenzie Pass segment (State Highway 242). State Highway 126, the third segment of this loop, parallels the McKenzie River, and provides spectacular views of a National Wild and Scenic River.

The general landscape of the Scenic Byway is composed of dense coniferous vegetation, varied terrain, an abundance of geologic features, lakes and rivers, wildlife, and snow-capped mountain peaks. Together they form an outstanding scenic resource. This resource provides a broad range of natural and managed scenic experiences for both local and distant visitors.

The quality of the Byway's scenic resources is important to the local tourist industry as well as the Pacific Northwest. Many residents from both sides of the Cascade Range and visitors from other states, through their recreational pursuits, seek an overall natural appearing landscape in contrast to their normal surroundings of urban streets and agricultural lands. The scenery of the Byway is also an important asset to local communities which are attempting to diversify their economic base to off-set declines in other sectors of the local economy.

Geologic Provinces

The scenery of the Byway is characterized by two distinctive geologic provinces or landscape character types: 1) the Western Cascades and 2) the High Cascades. Each landscape character type, described below, is a broad geographical area that exhibits throughout its extent similar features of landform, rock form, vegetation, and water form.

Although landform is usually the most significant feature, all features combine to create a distinctive visual image of the character type. These landscape character types are further divided, along the Byway route, into scenic character zones. A description and map showing the location of each character zone is provided below.

The Western Cascades landscape character type is oriented in a north-south direction and occupies the western one-quarter of the Byway. The High Cascades character type, also oriented in a north-south direction, occupies the eastern three-quarters of the Byway area.

The Western Cascades type is characterized by a general conformity in ridge crests separated by deep valleys with moderately steep, highly dissected, side slopes. In the southern portion of this type, the

major valleys are V-shaped. Glacial features are evident, but not pronounced throughout the area. Some rock cliffs and rock outcrops exist.

Vegetation is characterized by dense stands of large trees including western hemlock, Douglas fir, and true fir. Most areas have a continuous cover of overstory and understory vegetation. Deciduous species, such as alder and maple, are often intermixed along drainages. Some meadows are found in both lower and upper elevations.

A wide variety of rock formations exists in the area but most are hidden by the dense vegetative cover. Some extensive bare rock ridges and volcanic plugs stand out above the vegetation. Old volcanic lava flows are sparsely vegetated. Water bodies, particularly lakes, ponds, and marshes are scarce within this character type. Other water forms consist of streams and major rivers, all of which drain west into the Willamette Basin.

The visual experience of Forest visitors in this landscape type is generally characterized by views that are focused or directed at points or features in the landscape by road and trail side vegetation or landform structure. To a lesser extent, visitors will also experience landscape spaces enclosed by a continuous physical barrier of trees, hills, or mountains.

The High Cascades landscape character type consists of a volcanic plateau capped by shield volcanoes, cinder cones, and other volcanic forms such as lava flows of various ages. All these landforms are in various stages of disintegration. It is essentially an area of rolling terrain, but is interrupted at intervals by glaciated channels in the major drainages. The area is dotted with a chain of volcanic peaks and cones which rise above the surrounding landscape. Much of the landscape is mantled with pumice and volcanic ash.

Vegetation is characterized by both dense and open stands of conifers. Usually with sparse understory, western portions are dominated by Douglas fir, hemlock, and true fir. Eastern portions have mostly mountain hemlock and lodgepole pine. In higher elevations there are meadows with lush stands of alpine and sub-alpine vegetation.

Rock forms are numerous and significant in the landscape. Most rock forms are volcanic in origin, either glaciated volcanic peaks, lava flows, or talus slopes. Some deep, glaciated canyons exhibit extensive rock cliffs on their steep side walls. A wide variety of water bodies dot the landscape. These include marshes, lakes, streams, and rivers. Many of the lakes and small streams are the headwaters for rivers flowing west to McKenzie River or east to the Metolius River and Deschutes River.

The visual experience of Forest visitors in this landscape type is characterized by broad panoramic views encompassing considerable distance. The views are dominated by a single landscape feature or group of features. Visitors will also experience, to a lesser extent, areas of open space defined by a continuous physical barrier of trees, hills, or mountains.

Landscape Character Zones

Describing and differentiating areas of the Byway into zones of similar character, based on natural history, morphology, and cultural development, provides a basic understanding and composite image of the landscape experienced the highway traveler. The image described below provides not only an understanding of the traveler's experience, but also a record of the character of the present landscape. The Byway is divided into 17 character zones which are shown in Figure B-16 and are described as follows:

Zones 1-10: Highway 126/20 - From the junction of 242 to Santiam Pass and Sisters

Zone One: Zone One extends West from one mile east of McKenzie Bridge to 3/4 of a mile east of the Belknap Springs junction.

Lookout Ridge dominates the north side of the valley and to the south Foley Ridge screens the views of Ollalie Ridge further to the west, and the valley floor narrows in comparison to the lower McKenzie valley. The traveler is visually removed from the McKenzie River in this area where visual experiences consist primarily of rock outcroppings along major ridge systems and foreground diversity. The valley floor is a mosaic of burn and harvest patterns with narrow screening strips of mature and old-growth Douglas-fir adjacent to the highway. The upper portions of the valley walls also support a cover of mature Douglas-fir.

Cultural development is limited in this zone to the Belknap Hot Springs and the summer residences at Scott Creek.

Zone Two: Zone Two includes the area from 3/4 of a mile east of the Belknap Springs junction to the upper end of Trailbridge Reservoir.

This section of the Byway landscape is characterized by a dramatic narrowing of the space between the valley walls and a shrinking of the valley floor. Accompanying this topographical transformation, the McKenzie River is united with the highway by the narrowing canyon, and the vegetation previously held back from the highway is allowed to cascade very near the edge of the roadway. The McKenzie River flows between the Old Cascades to the west and the High Cascades to the east. Above the canyon walls to the east, a high plateau rises gradually to angular buttes and the recent Cascades peaks. To the west the older landscape is deeply dissected, forming the steep, rugged canyons and ridges characteristic of the Old or western Cascades.

The highway is relatively level, with a series of tangents separated by broad curves and lined with mature Douglas-fir. The steep canyon walls also support a dense cover of mature to old-growth Douglas-fir interspersed with numerous rock outcroppings.

This zone is the most closely associated with river of all the character zones along the Byway loop. The river and highway flow together for almost one-half of its length through this zone, and often separate and rejoin, forming adjacent, half canopied corridors which cut through the Douglas-fir forest. The river, along with its notable tributary Olallie Creek, creates the most interesting aspect of the zone.

Cultural activities and development include some harvest areas, a burn and salvage on the headwalls of Frissell Creek drainage, two campgrounds, and the Trailbridge Reservoir. Though the reservoir is not aesthetically objectionable to the viewer, the siting of the powerlines, generating facilities, and residential area together with their component materials and color schemes represent the greatest impact to scenic quality along this zone of the Byway.

Zone Three: Zone Three extends from the north end of Trailbridge Reservoir 8 and 1/2 miles to the edge of the extensive laval fields, 1/3 of a mile south of Fish Lake.

Leaving Trailbridge Reservoir, the highway parts from the river and climbs the Kink Creek grade out of the McKenzie River canyon and on to the high plateau region of the High Cascades. The

increase in the rate of ascent is the first significant grade of the highway. This change in grade is accompanied by an opening in the coniferous cover which reveals distant panoramic views of Horsepasture and O'Leary Mountains and Taylor's Castle to the west. At its crest, the grade gives way to the rolling topography of the plateau and the highway crosses a lava flow, extends a panoramic view to Smith Ridge, rejoins the river grade, and skirts the western edge of Clear Lake near the end of the zone.

The lava is of the most recent, essentially unweathered type, and is sparsely vegetated with contorted and stunted trees and shrubs. One partially screened view is afforded of Clear Lake; however, with selective removal of trees, an excellent vista of the lake, Sand Mountain, and associated ridges beyond could be created. With the exception of the lava crossing, the vegetation is a mosaic of old-growth timber within a mature Douglas-fir forest throughout the zone.

Zone Four: Zone Four is a small, 1 and 3/4 mile segment along the highway, from the contact of the forest and lava, 1/3 of a mile south of Fish Lake, to the junction of Highways 126 and 20. Though the highway is continually increasing in elevation, the grade is not significant within this zone.

The entire zone is characterized by the largest crossing of the most recent lava flows on Highway 126. On the north end of the zone, the highway runs along a contact between the unweathered, sparsely vegetated lava and the older Forest ecosystem. To the south near Fish Lake, the highway crosses the lava. Where lava borders the highway, the sparse, stunted vegetation allows views of the surrounding peaks. Prominent areas of background are Browder Ridge, Echo mountain and North Peak to the west, and Nash Crater, Sand mountain and its associated ridge to the east.

Other features which are visible from this Zone are the Three Sisters, Scott mountain, Three Fingered Jack and Mt. Washington.

The typical scrubby vegetation of the lava flow consists of Douglas fir, incense cedar and mixed understory. The forest vegetation is old-growth Douglas-fir, with and understory of hemlock.

Though the traveler is beyond or has not yet reached the McKenzie River and its source at Clear Lake, the pools and waterways of Fish Lake create a unique and varied water feature. Fish Lake is a large, intensely green meadow of sedges, grasses, and mint, surrounded by a thin border of willow and poplar. When the water table is high, the meadow and dry creeks fill with water and support a species of migrating fish, the Hackleman trout.

Cultural activities include numerous harvest units to the west, and a campground and work center at Fish Lake.

Zone Five: Zone Five is a 2 mile segment of the Byway from the junction of Highways 126 and 20 to the edge of the lodgepole pine forest, one-half mile west of the entrance to the Little Nash Crater cinder mine.

The geomorphology of this area is the same as Zone Four. The physiographic qualities which separate them are the rugged, trough-and-hummock lava surface, and the presence of a dense mature vegetation adjacent to the highway. Though the vegetation obscures lateral views, it also forms a focal corridor in which Three Fingered Jack rests at the apex, as a dominant feature. Glimses of Nash Crater are also available from this zone. The vegetation is predominantly Douglas-fir, with some lodgepole pine.

Zone Six: Zone Six is a one and one-half mile segment of the route from the western boundary of the lodgepole pine stand, one-half mile west of the Little Nash Crater cinder mine, to its eastern boundary at the junction of Highways 20 and 22.

The topography of this area is characteristic of the High Cascades--a gently sloping plateau with sporadically distributed angular landforms of recent volcanic origin. Little Nash and Nash Craters are two such volcanic cones which dominate the views of this portion of the Byway.

The Santiam Highway maintenance facility is the only cultural development in this zone. Architecturally, it is pleasing and does not create an undesirable visual impression, though some partial screening of the storage areas should be considered. The cinder mine on Little Nash crater has expanded to the point where it is becoming apparent and with further expansion may produce undesirable aesthetic consequences.

Zone Seven: Zone Seven begins at the junction of Highways 20 and 22 and extends five miles to Hogg Rock, just 1/3 of a mile west of the Big Lake Hoodoo exit.

This portion of the Byway begins and ends with prominent grades, increasing in elevation 1,000 feet, with an enclosed valley inbetween which contains Lost Lake. Both grades climb along the edge of angular landforms, that present both interesting geologic features and exceptional panoramic views. Views to the north and west are of Three Fingered Jack, Maxwell Butte, Lost Lake, the Three Pyramids, Ernie's Butte, Crescent Mountain, Lava Lake, North Peak, Echo mountain, Browder Ridge, and Potato Hill. Other important features viewed from this zone are Hayrick and Hoodoo Buttes to the south and Hogg Rock along the north side of the highway.

Geologic features are evident at several locations along this segment and contribute greatly to the scenic interest of the Byway route. Just west of Lost Lake, as the road sweeps around a cinder cone on its first upward grade, a large cut exposes great depths of red volcanic cinder. In the bottom of the enclosed valley formed by Hogg Rock, Potato Hill, Twin Cinder Cones, Maxwell Butte, and just east of Lost Lake on a small hummock, twisted columnar fracturing is exposed to view. Hogg Rock is also of geologic interest as a large volcanic extrusion with a platy fractured pattern.

Until the crest of the first grade, mixed age stands of small sawtimber to old-growth Douglas-fir dominate the visible landscape. In the enclosed valley between the grades, Douglas-fir begins to give way to small patches of lodgepole pine, white fir, true fir, true fir and mountain hemlock. The second grade at the east end of the zone is dominated by true fir and mountain hemlock.

Lost Lake is the only natural lake that is clearly visible from the highway, and is visible long enough to be visually consumed. Harvest units are not visible within the zone, but panoramic views to the west illustrate some of the most heavily modified sites in the forest, where land ownership is mixed private and Forest Service. Cultural development viewed from within the zone includes an unobtrusive campground at Lost Lake, and skiing facilities at Hoodoo Butte.

Zone Eight: Zone eight extends from 1/3 of a mile west of the Big Lake-Hoodoo exit to a location just beyond the common boundary of the two Forests at Santiam Pass.

This short zone is nearly level, and the highway which passes through it is straight and focal. This portion of the Byway is also distinguished by the width of the roadway. The roadway in this area accommodates a passing lane and in winter its extreme width provides space for applying and

removing tire traction devices and access to winter recreation sites. Although the roadway corridor is broad in this area lateral views are obscured by roadside vegetation. This high altitude landscape supports a forest of true fir and mountain hemlock.

Cultural development includes the exits for the old Santiam Lodge, Hoodoo-Big Lake-Ray Benson recreation complex, Hoodoo Summer Home tract, Pacific Crest Trail access, and the Highway Departments storage facility.

Zone Nine: Zone Nine extends approximately 5 miles from the high altitude landscape near the summit, down along the south facing slopes of a glaciated canyon wall. Many "pullouts" have been left by past highway construction projects, and are used primarily for removing or putting on tire chains. Some of these "pullouts" are large enough for use as viewpoints and interpretive displays.

The traveler moving east through this zone first catches several good views of Black Butte, with the tower visible, directly in line with the Highway. Mount Washington is visible to the south with one particular pullout that showcases this mountain and the canyon landscape. This has become a popular viewing and photography point.

Just past this Mt. Washington viewpoint, the traveler begins to catch views of Blue Lake and then Suttle Lake. At least one of the small pullouts here gives views of both lakes. This zone ends at the east end of Suttle Lake where the elevation has dropped to around 3400 feet, where the Highway breaks out onto a more rolling terrain.

Zone Ten: Zone Ten extends from Suttle Lake to the town of Sisters. Vegetation changes as the climate becomes drier, and mixed conifer gives way to primarily a Ponderosa pine forest. The Aspen surrounding Glaze Meadow, just past Black Butte, provide a dramatic visual contrast.

There is a spectacular view of the North Sister in the background set off by Glaze meadow in the foreground as the Highway makes the final turn towards the town of Sisters. There is one more good view of the Three Sisters Mountains just after this curve and then only glimpses filtered by the trees, until turning onto Highway 242 at Sisters heading west.

The straight stretch of highway going into Sisters provides a view of Lava Top Butte in the distance. The Butte is actually 5650 feet in elevation and approximately 33 miles away. Little happens to break up the corridor effect along this stretch of highway.

Zones 11-17: Highway 242 - from Highway 126 to Sisters

Zone Eleven: Zone Eleven begins at the junction of Highway 126 and Highway 242 and continues 3 and 1/3 miles to the location where the highway crosses Whitebranch Creek. Here the traveler has moved from the broader McKenzie River Valley to a smaller, narrower, glacial valley and on to a narrower, older highway. In this flat-bottomed, steep-walled valley small drainages sheet from the steep, unbroken slopes, and into nearly unnoticed Whitebranch Creek.

In this segment of the Byway, the highway winds along the valley floor through long, tightly enclosed focal views. The tall, mature, enclosing vegetation creeps up to the very edge of the pavement, and the traveler, submerged in a crevice of green foliage, nearly unaware of the larger surroundings.

Almost without exception, these walls of vegetation are formed by dense stands of mature and old-growth Douglas-fir.

In the first mile of this zone, a few acres of private land have been harvested and are in various stages of regeneration. The only cultural developments are in conjunction with these holdings, and consist of an abandoned service station, a few residences, and a campground facility known as Camp Yale. Although none of these represent dramatic contrasts to the scenic character of the Byway, in some instances improvements to the overall appearance of structures would enhance the Byway travelers' experience.

Zone Twelve: This portion of the Byway includes a 4 and 1/4 mile segment of highway from the crossing of Whitebranch Creek to the lower end of Dead Horse Grade, approximately 1 mile west of Proxy Falls wayside where the Three Sisters Wilderness adjoins the south side of the highway. The gradual ascent of Highway 242 experienced to this point gives way to a slightly steeper grade through this zone. Alternately, the thick forest screen opens to reveal the larger landscape of the canyon walls, and then closes to conceal the traveler in a densely canopied tunnel formed of vegetation. Major views open to Cupola Rock, Deer Butte, and the Three Sisters, as well as to the rocky, partially canopied walls and rimrock of the glacial valley. The south-facing slopes of the northern walls and the north side of the valley floor were burned by wild fire in the eastern half of this zone. The highway passes through this burn area, which is moderately well vegetated with deciduous brush and young Douglas-fir, some areas support pure stands of western hemlock, which is also found well integrated with the Douglas-fir.

Cultural activities are subordinate in this zone, and include only slightly visible harvest units on the rims and along the base of the valley walls.

Zone Thirteen: This zone continues for 6 and 3/4 miles, from the point where the Three Sisters Wilderness adjoins Highway 242, to the top of Dead Horse Grade, just 1 mile west of Frog Camp. Along this segment of the Byway, the traveler rises out of the glaciated valley and up on to the high plateau of the recent Cascades, an area of dramatic contrast to the highly dissected, rounded ridges and canyons of the older Western Cascades. The high plateau of this younger landscape is only occasionally broken by angular forms of specific glacial or volcanic origin. The slight increase in highway grade experienced in the previous zone changes suddenly to an extremely steep grade as the narrow highway switches back and forth, rising toward the high plateau. The steep grade, narrow road and sharp turns slow the travelers pace, allowing one to view the details of this high elevation landscape. As well as introducing the traveler to the individual components of the forest ecosystem, this slower rate of travel allows the enjoyment of panoramic views that unfold as the grade is ascended.

Major views of this zone include Horse Pasture mountain, Taylors Castle, Lamb Butte, Lowder mountain, Foley Ridge, Proxy Point, the Husband, and the Three Sisters. Vegetation types also respond to this rapid change in elevation. Toward the east end of the zone, the Douglas-fir dominated forests give way to stands of true fir, mountain hemlock and lodgepole pine.

Zone Fourteen: This zone begins 1 mile south of Frog Camp and continues north for 4 miles, to the edge of the unweathered lava flows of Belknap Crater, 1 and 1/4 miles west of Craig Monument.

This broad, comparatively flat segment of the Byway is characteristic of the plateau region of the High Cascades. Major visible landforms of this zone include two views of the Three Sisters, and one

of Simms Butte. The land is composed of partially weathered lava flows, with cinder and glacial deposits. The highway crosses this flat area in long straight segments, with most of the lateral views screened by thickest so young lodgepole pine. These thickets open occasionally as the road enters small alpine meadows and the sedges and grasses add hues of yellow and red and light green to the landscape. These moist forest openings are often surrounded by bands of willow, and occur at the Scott Lake Road and the Hand Lake trailhead area. Interspersed within the lodgepole pine thickets are mountain hemlock and species of true fir, forming communities where they become the dominate forest type.

The entire east flank of this highway segment, with the exception of a 1 mile stretch in the vicinity of Frog Camp, is bordered by the Three Sisters Wilderness. North and parallel along the west side of the Byway from 1/3 of a mile south of Hand Lake trailhead lies the Mt. Washington Wilderness.

Zone Fifteen: This zone begins 1 and 1/4 miles west of Craig Monument and continues 6 and 1/2 miles east, encompassing Dee Wright Observatory, to Windy Point on the Deschutes National Forest. This section of highway is visually the most unique of the areas along the Byway corridor. The character of this segment of the Byway is composed of young to recent lava flows, cinder cones, and craters. The landscape is essentially barren, unweathered lava, lava sparsely vegetated with twisted deformed scrub, and cinder mounds moderately vegetated with healthy alpine fir and mountain hemlock.

This area of the Byway appears as a shallow dish, the rim formed by the many volcanic craters or mountains, and the bottom of the dish by the lava which extruded from them. The rim is formed by Belknap Crater, Little Belknap Crater, Dugout Butte, Black Crater, Yappoa Crater, North and Middle Sister, Little Brother, Four-in-One Cone, Condon Butte, Scott mountain and Twin Craters, many of which are near perfect volcanic cones. Other important landforms visible from this area of the Byway are Mt. Hood, Mt. Jefferson, Mt. Washington, Cash Mountain, Bald Peter, Black Butte, the Husband, and Horse Pasture Mountain.

With the exception of sparse, contorted vegetation on a few of the recent lava flows, vegetation in this segment of the Byway is confined to isolated stands of mixed coniferous species surrounded by recent lava flows. The stands are comprised of two forest types characteristic of this altitude--young, fairly open lodgepole pine stands and larger denser stands of mountain hemlock and alpine fir.

All lands within this zone are designated Wilderness, except for a 1 and 1/2 square mile area managed partially for research purposes and partially for dispersed recreation and the Dee Wright Observatory. The Dee Wright Observatory, an historic structure, provides travelers with an opportunity to obtain an overview of the uniqueness of the High Cascades landscape. The observatory and its associated trails are heavily used and well appreciated by visitors to the Forest.

Zone Sixteen: This zone extends from Windy Point approximately four miles to the vegetative changes that signal a much drier climate.

This section of the Byway landscape is characterized by a windy road through fairly dense canopy. Opportunities for views of lava flows or the Cascade mountains are generally not available unless parking areas and short trails are developed to allow the visitor to get away from the Highway corridor. The elevation drops from 4900 feet at Windy Point to around 3800 feet as it winds between the edge of the Belknap lava flows and the lateral moraine left by the last glaciation.

Zone Seventeen: This zone extends from the obvious change in vegetation types to the town of Sisters. The landscape gradually becomes drier as represented by the vegetation changes from shrubs of snowbrush and manzanita to primarily bitterbrush. The Highway straightens out and junctions with many sideroads that provide access to sites such as Trout Creek Butte, Skylight Cave, Fourmile Butte, and the Cold Springs area.

Current Management

Changes in the landscape of the Byway in recent centuries was due primarily to wildfires. Since the late 1800s noticeable change has been due to a variety of land and vegetation altering activities, such as road and railroad construction, timber harvesting, dam building, recreation facility development, and wildfires. Human-caused changes are most apparent in the Western Cascades character type, as evidenced by a mosaic of harvest areas in various stages of regeneration.

To assure protection of areas within what is now the Scenic Byway, Forest managers regulate the rate at which change is introduced into the highly scenic areas of the landscape. These actions are focused on assuring that the public's long-term expectations for scenic quality are being met within the Byway area; however, a Scenic Byway designation does not preclude other activities such as creating new views or vistas, interpretive programs, wildlife management programs, meadow habitat improvements, or timber harvesting.

The public's increasing desire for scenic quality is partially reflected by increased demand for recreational opportunities in which scenic quality is an integral part. These could include driving for pleasure, hiking, camping, and fishing. As population increases within the region greater numbers of users will expect attractive and pleasing environments for many of their recreational activities. The quality of view from recreation sites, scenic travelways, and prominent view points will become increasingly important.

Enhancement and Restoration Opportunities

Numerous opportunities have been identified along the Scenic Byway to improve or enhance the quality of the scenic resources and the visual experience of Byway travelers. The opportunities for improvement of the scenic resource are listed below and their locations are illustrated in Figure B-17. In addition several locations identified as improvement or enhancement opportunities could be utilized to interpret specific management techniques employed for management of the scenic resource.

U.S. HIGHWAY 20 AND HIGHWAY 126

1. Look for opportunities to create openings in the foreground screen between Indian Ford and the town of Sisters. This would improve depth of view and glimpses of the Three Sisters mountains. Traveling east on this tangent provides a distant (approximately 30 to 35 miles) view of Lava Top Butte (elevation 5,650 feet on the Fort Rock District).
2. Thin or selective removal of foreground screen at Glaze Meadow to maintain the existing view of North Sister. This is not considered a good location for a pullout, but could be interpreted or noted on an audio tape or in a brochure.

3. The opportunity to thin and open the canopy along both sides of the highway exists between Suttle Lake and the Camp Sherman turnoff. This would enhance visual interest, but only while meeting the desired future condition for the area. Highlight the large Ponderosa pines, thin the understory, and look for a visual opening towards Three Fingered Jack.
4. On the south side of the highway overlooking Blue Lake and Suttle Lake the timber stands could be thinned between each lake and the highway to maintain glimpses of the lakes from the Byway. Selectively remove portions of foreground to open views into these lakes from one of the larger pullouts.
5. Develop the viewpoint at the pullout known as the Mt. Washington Overlook. It is between the Corbett Sno-Park and Blue Lake.
6. Views of Black Butte, where the lookout on top is visible from the highway, could be interpreted on an audio tape.
7. Pullouts on the south side of the highway which overlook high alpine meadows and wetlands can be used for semi-developed viewpoints and photo points. The area is within an HCA and there is no opportunity for thinning or trail development. Interpretation should be by audio tape or brochure.
8. On the south side of the highway at the Santiam Pass consider thinning stand for light penetration to stimulate understory growth - perhaps plant edge of stand.
9. There is a possible need for harvest unit rehabilitation, as seen from the vicinity of Little Nash Crater.
10. The opportunity exists to thin this area to open the view of the airstrip on the south side of the highway and a possible view of Maxwell Butte on the north side.
11. The timber stands surrounding the junction of U.S. Highway 20 and State Highway 126 could be thinned to create a greater sense of space and to further enhance vegetation diversity and improve fall color displays.
12. Revegetate fill slopes of U.S. Highway 20 at the junction of State Highway 126.
13. Thin foreground stand to deepen view into stand, highlight big trees and stimulate growth of broadleaf species. The objective here is to strengthen the connection of the lava flow from one side of the road to the other, open the vegetated area of the lava flow, and enhance fall color displays of this area.
14. Opportunity for views into Fish Lake by limbing up large poplars in the foreground of State Highway 126.
15. A possible need for harvest unit rehabilitation exists as seen from descending areas on the Santiam Pass.
16. Thin or otherwise manipulate to highlight big trees in this area.
17. Selectively remove portions of foreground to open views into Clear Lake for westbound travelers.

18. Thin to highlight big trees and to provide a filtered view of Clear Lake and beyond.
19. Potential exists to open a southwest view of Tamolich Valley for westbound travelers.
20. A second opportunity for views into Tamolich Valley.
21. Thin or selectively remove foreground screen to open views to the lower valley.
22. Thin opportunity to deepen view into stand and to highlight big trees.
23. Thin opportunity to deepen view into stand and to highlight big trees.
24. Thin or selective removal of foreground screen at open views of near middleground ridge for eastbound travelers and view of lower valley for westbound travelers.
25. A possible need for harvest unit rehabilitation exists as seen from areas descending the Kink Creek grade.
26. Use the opportunity to open a deep view into existing stands if the middleground area is forested. Otherwise avoid exposure of cutover areas.
27. Consider seeking a cooperative agreement with EWEB to provide alternate color schemes for the residential complex, powerline towers, and related generating facilities.
28. A potential parking facility with rest facilities. Landscape, pave, sign, and rehabilitate the cut and fill slopes along the road at the back edge of the lot.
29. Revegetate the reservoir edge on the south and west sides, the road cuts and fills on the upper slopes, and the rock point at the reservoir outlet.
30. Selective removal of understory to deepen view into stand from roadside edge. In some locations within this stand area the emphasis should be thinning for large tree character and depth of view. Toward the north end of this area cedar may be favored.
31. A possible need for harvest unit rehabilitation exists as seen from areas descending from the Kink Creek grade and upon approaching Trailbridge Reservoir.
32. There is an opportunity to do a very careful removal of selected vegetation to enhance the visibility of Ollalie Creek for both directions of travel.
33. Thin out encroaching young Douglas-fir trees to allow full display and enhancement of bracken fern along this section of highway.
34. White water river views may be enhanced at this location with careful limbing and with some removal of understory. This areas has great potential for a small picnic area. Sight distance is less than desirable.
35. Good white water river views could be enhanced here with some thinning. This would also make a quick-stop pulloff. The area has an opportunity for a close-contact river experience.

36. A possible need for harvest unit rehabilitation exists as seen through foreground screen between Frissell Creek and Twist Creek. The extent of the area needs definition.
37. There is the opportunity to highlight the Wild and Scenic River status of the McKenzie River through signage. There is a long, but unimpressive, view of the river at this point.
38. A possible need for harvest unit rehabilitation exists as seen from upriver areas between Twisty Creek and Boulder Creek.
39. The opportunity for close contact with the river environment exists through development of this site by providing information about Wild and Scenic Rivers and the Scenic Byway. Is also a point for McKenzie River trail access.
40. Highlight and maintain the permanent visibility of the creek. It will need periodic maintenance. Bridges need to be refurbished in some manner, either through painting or the use of corten steel guard rails, etc. This would be typical for all highway appurtenances within the Scenic Byway.
41. Thin to create deep forest views, maintain understory for fall color display, but with some undergrowth clearing.
42. Some careful thinning of vegetation around bridge. Will need periodic maintenance to maintain visibility of creek. Same as Number 34.
43. Junction of State Highway 126 and State Highway 242. This area needs rehabilitation of cut and fill slopes and enhancement as a Scenic Byway entry or gateway through selected plantings of native-plant materials. The use of painted islands to separate traffic and control ingress and egress at this junction needs to be rethought. The use of planted islands with low-growing materials could greatly enhance this area as a gateway. There is a need to rethink and reorganize signage at this site.

HIGHWAY 242: FROM HIGHWAY 126 TO SISTERS

1. Selectively remove understory vegetation to open views to the area and enhance the sense of an enclosed landscape space as viewed from both directions of travel.
2. Remove and rehabilitate road in meadow area. Create a ditch along both sides of State Highway 242. Also employ other methods to prevent vehicle access to the areas on both sides of the road. Maintain an outer edge of opening to avoid encroachment and of vegetation into the space.
3. Thin back edge of foreground screen to improve definition and awareness of canyon wall in the near background.
4. Thin foreground screen to improve visibility and awareness of roadside opening and increase depth of view.
5. Selectively thin foreground timber to create an open view of Cupola Rock as viewed from both directions.

6. Remove from 6-10 trees opposite the intersection of a side road. This would open an expansive view of the canyon wall. From this point east remove timber and large understory vegetation to maintain views. Good area for fall color display.
7. After passing the lower gate going east, selectively remove understory vegetation to open and enframe distant views of canyon walls and ridges. Good views of fall color.
8. Remove foreground vegetation to provide expansive views of the Cascade Range or construct a significant pull off to access the view behind the vegetative screen.
9. From the Scott Road viewpoint westward are a series of grassy openings where removal of infilling vegetation is desirable to maintain the scenic qualities of these grassy openings outside of wilderness boundaries.
10. Perform minimal thinning of this wetland edge to enhance its visibility and its relationship with the adjacent lava flow.
11. Remove vehicular access from the area surrounding Craig Lake and selectively thin vegetation to highlight the lake feature.
12. Thin or remove vegetation screen to provide a transitional view of lava fields.
13. Thin or remove vegetation screen to open a distant southwest view of ridges and canyon wall.
14. Improve the Windy Point pullout to provide safer parking.
15. Cold Springs trail development to showcase views through the aspens.

Sources of Additional Information

McKenzie Viewshed Management Guide, Willamette National Forest (Draft)

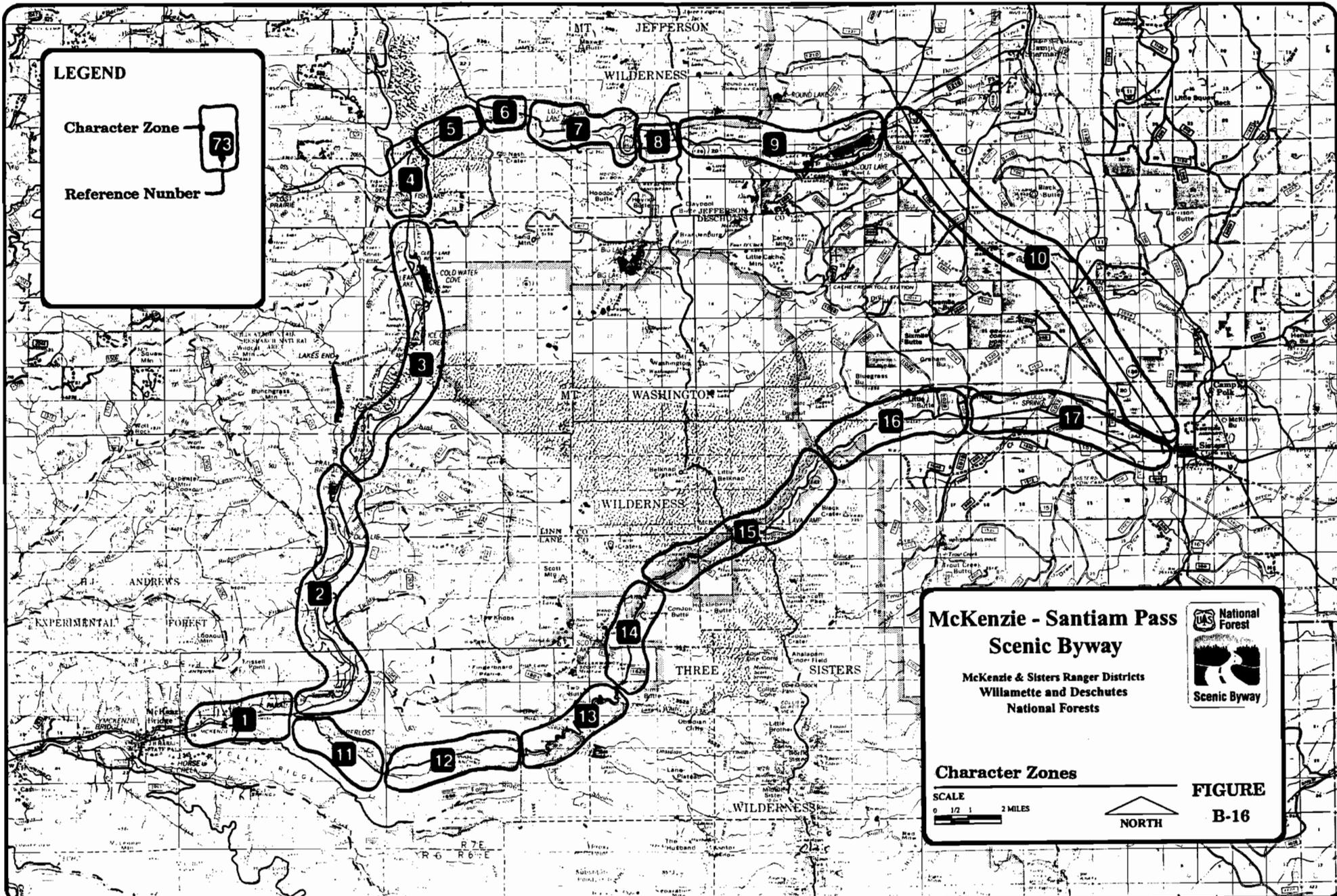
U.S. Highway 20 Viewshed Management Guide, Deschutes National Forest

LEGEND

Character Zone



Reference Number

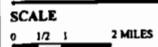


**McKenzie - Santiam Pass
Scenic Byway**

McKenzie & Sisters Ranger Districts
Willamette and Deschutes
National Forests



Character Zones

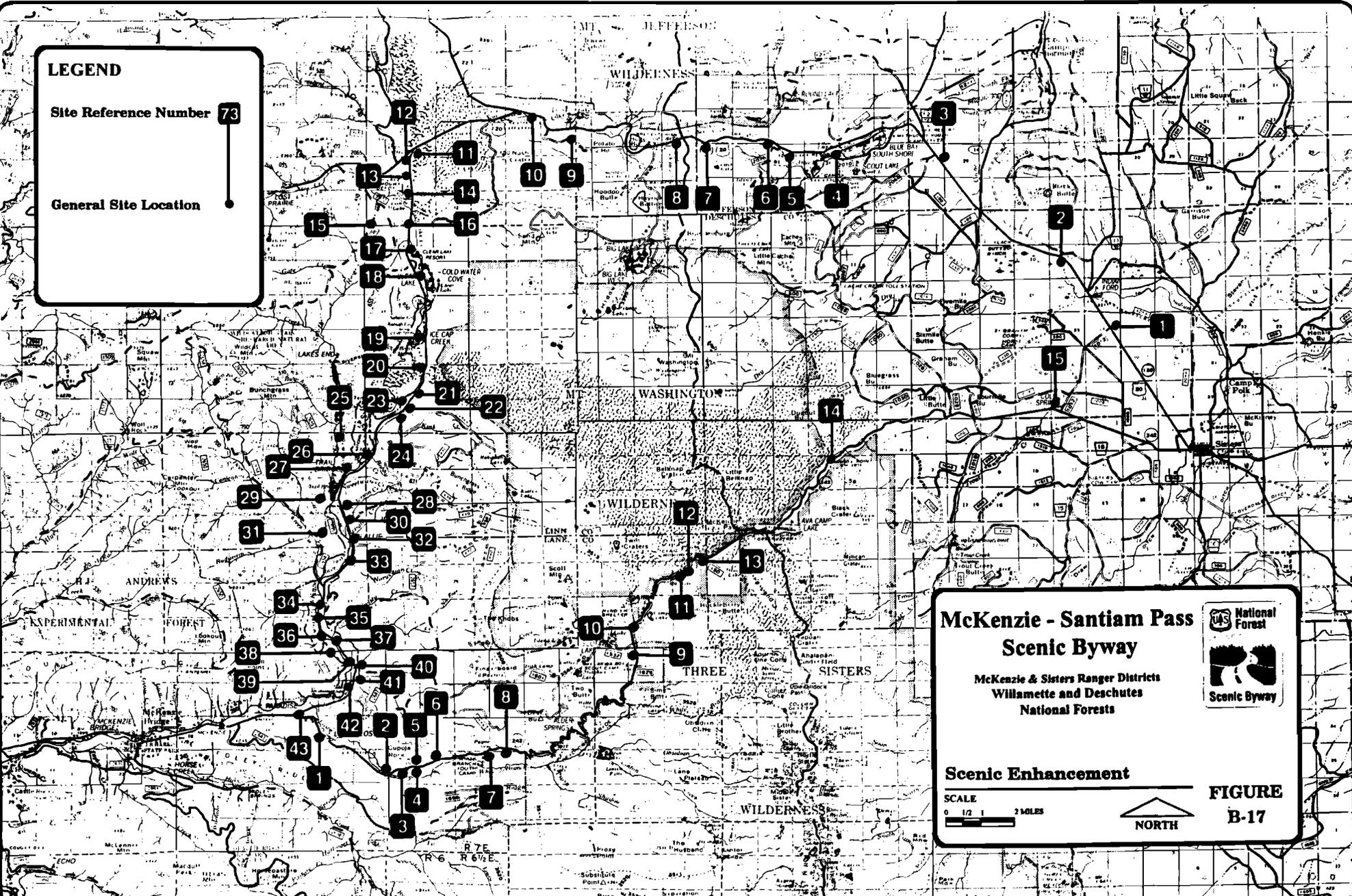


**FIGURE
B-16**

LEGEND

Site Reference Number  73

General Site Location 



**McKenzie - Santiam Pass
Scenic Byway**

McKenzie & Sisters Ranger Districts
Willamette and Deschutes
National Forests



Scenic Enhancement

SCALE
0 1/2 1 2 MILES

 NORTH

**FIGURE
B-17**

TRANSPORTATION

Description

The transportation system of the Scenic Byway is a result of a colorful historical evolution, beginning in the 1800's. Remnants of the historic Euro-American use (1805-1910) include trails, wagon roads and portions of retired railroad grades that still exist on the present-day route.

State legislature first authorized construction of a road across the Cascades, by way of the Santiam River, in 1847. In 1864, the Willamette Valley and Cascade Mt. Wagon Road Company surveyed a route that originated near the Deschutes River, and traveled 80 miles down the south fork of the Santiam River. When construction was completed in 1865 by army volunteers, this route became a toll road. From 1871 to 1889, a short segment of railroad, running north of Highway 20 from Lost Lake to east of Hogg Rock, was constructed by T. Egerton Hogg in order to preserve his rights to land grants. In 1878 a route alternative to the Santiam Toll Road lead directly to the townsite of Sisters, Oregon, via Cache Creek. In 1891 there was intensive use of the toll road, including hauling of wool, fruit and vegetables, supplies, and livestock drives. Mail carriers began using Fish Lake as a remount station in 1896. The early 1900's saw the beginnings of serious development for this route, including a CCC constructed truck trail from Belknap Springs to Clear Lake. In 1962, a section of Highway 126, also known as the Clear Lake Cutoff, was dedicated, connecting McKenzie Pass to Santiam Pass.

The pass in the Upper McKenzie region was, during the 1800's, simply a trail over the Cascades. This trail was also referred to as the Scott Trail. Several people were interested in making this trail easier to travel, as wagon use was increasing in order to supply cattle to miners in Idaho. John Craig explored a new route, and constructed it after settling in what is now McKenzie Bridge. His route bypassed the Scott Trail by a lower elevation of 1000'. His route became a toll road in 1872.

Present day use of the transportation system that comprises the scenic byway is a far cry from the dusty travels of wagons and cattle drovers. State Highway 242 is used as an alternate route for through traffic during the peak recreational season, connecting Sisters to Milepost 55 of Highway 126. US Highway 20 is a major traveled way, connecting Sisters to metropolitan points west, including Albany and Salem. The Clear Lake - Belknap Springs Highway is a combination of commercial and tourist traffic, providing easier access to Central Oregon from the Southern Willamette Valley. This route has virtually no local traffic and connects the South Santiam and McKenzie Highways on the westerly slope of the Cascade Range. This route is also important access to the forest and for the hydroelectric facilities of the Eugene Water and Electric Board.

Recreation access via the scenic byway include camping, driving for pleasure, fishing, boating-related activities, hunting swimming, picnicking, hiking, resort use, alpine and nordic skiing, snowmobiling, mountain climbing, gathering of forest products, and horseback riding. From highways US Highway 20 and State Highways 126 and 242, several forest roads and numerous trails branch out to many points of interest and to the variety of recreational opportunities located adjacent to the Byway route.

Traffic volumes vary on different sections of the Scenic Byway Route. Highway 242 carries between 250-1500 vehicles per year, and is only accessible during favorable weather conditions, usually June through October. This route is primarily scenic and accesses several popular Forest Service roads on the eastside. US Highway 20, from Sisters to the Metolius cutoff, carries 6,000 to 10,000 vehicles. US Highway 20 from the Metolius cutoff to the junction of US Highway 22 carries 3000 to 6,000

vehicles. US Highway 20/Highway 126 from the Clear Lake cutoff to the junction of Highway 242 carries 1500 to 3000 vehicles

Although it is difficult to predict the future traffic volumes along the Byway route, participation in all of the listed activities will undoubtedly increase as long as the opportunities are made available. Travel to wilderness access points will also increase as the appreciation of wilderness resource values increase. Urban and rural, local and non-local, and commercial travel will increase as population demands increase.

Management responsibilities for the transportation system are assumed primarily by the Oregon Department of Transportation, in coordination with the US Forest Service. The route passes through Lane, Linn and Deschutes counties, and is divided between three ODOT maintenance areas. Highway 126 to approximately Trailbridge Reservoir, and the western portion of Highway 242 are a part of the Roseburg Region. Highway 126 from Trailbridge, and Highway 20 to just over the Summit (near Hoodoo) is under the jurisdiction of the Salem Region. The eastside of Highway 242 to Sisters, and Highway 20 to the Summit is covered by the Bend Region.

A Forest Road Agreement was written in August of 1990 between ODOT and the USFS "for the cooperative planning, survey, design, construction, reconstruction, improvement and maintenance of certain Forest Development Roads in Lane and Deschutes counties". This agreement ensures that annual maintenance plans may include such items as sign installation and maintenance, roadside vegetative management, snow plowing, waste disposal sites and entry station operation. It also addresses the opening and closing of Highway 242 to public use during the snow season, along with travel restrictions on vehicle and vehicle trailer combinations greater than 35' in length.

In order to meet the management concerns of the scenic byway strategy, the existing character of the immediate roadside and near foreground will be retained through appropriate roadside maintenance practices and roadway improvement activities. Careful coordination between ODOT, as a special use permittee, and the USFS, will ensure that continued maintenance and improvements will meet the high scenic quality objectives of the Scenic Byway, while meeting management responsibilities of the roadways. These responsibilities include improvement of travel safety, improvement of signing distances and road alignment, and limitations on vehicle size and speed.

Recent improvements to the traveled ways within the Scenic Byway have taken place to increase longevity of the roadway and to provide a smoother, safer ride for users. A pavement recycle overlay and chipseal surface treatment was accomplished between the snowgates on Highway 242, milepost 61.6 to 83.7, during the summer of 1991. This work also paved several pullouts, vista points and intersection approaches. This year a pavement recycle overlay of Highway 126, from the junction of Highway 242, to approximately Trailbridge Reservoir, was completed to improve structural strength and rideability of the surface. Highway 20, from just below the Summit to was recently widened to include much needed passing lanes, and opportunities for travelers to more easily access several viewpoints and pullouts.

Plans are currently underway to construct a new intersection at the junction of Highways 242 and 126 in Sisters. This intersection will provide congestion relief and could provide an opportune location as an interpretive entry station.

Improvement Opportunities

1. Widening of the curve at the base of Santiam Hill, near Suttle Lake Resort Intersection.
2. Resurfacing of Highway 242 below snowgates on both the east and west ends.
3. Improve and define parking areas at Proxy Falls and Linton Lake Trailheads on Highway 242.
4. Provide passing opportunities on Highway 126 every five to eight miles, while preserving scenic qualities.
5. Improve entrance and exit to Corbett Snowpark on US Highway 20.

Sources of Additional Information

Forest Road Agreement Between the USDA and ODOT, August, 1990

Land and Resource Management Plan and Environmental Impact Statement, Willamette National Forest, Eugene, Oregon, 1990.

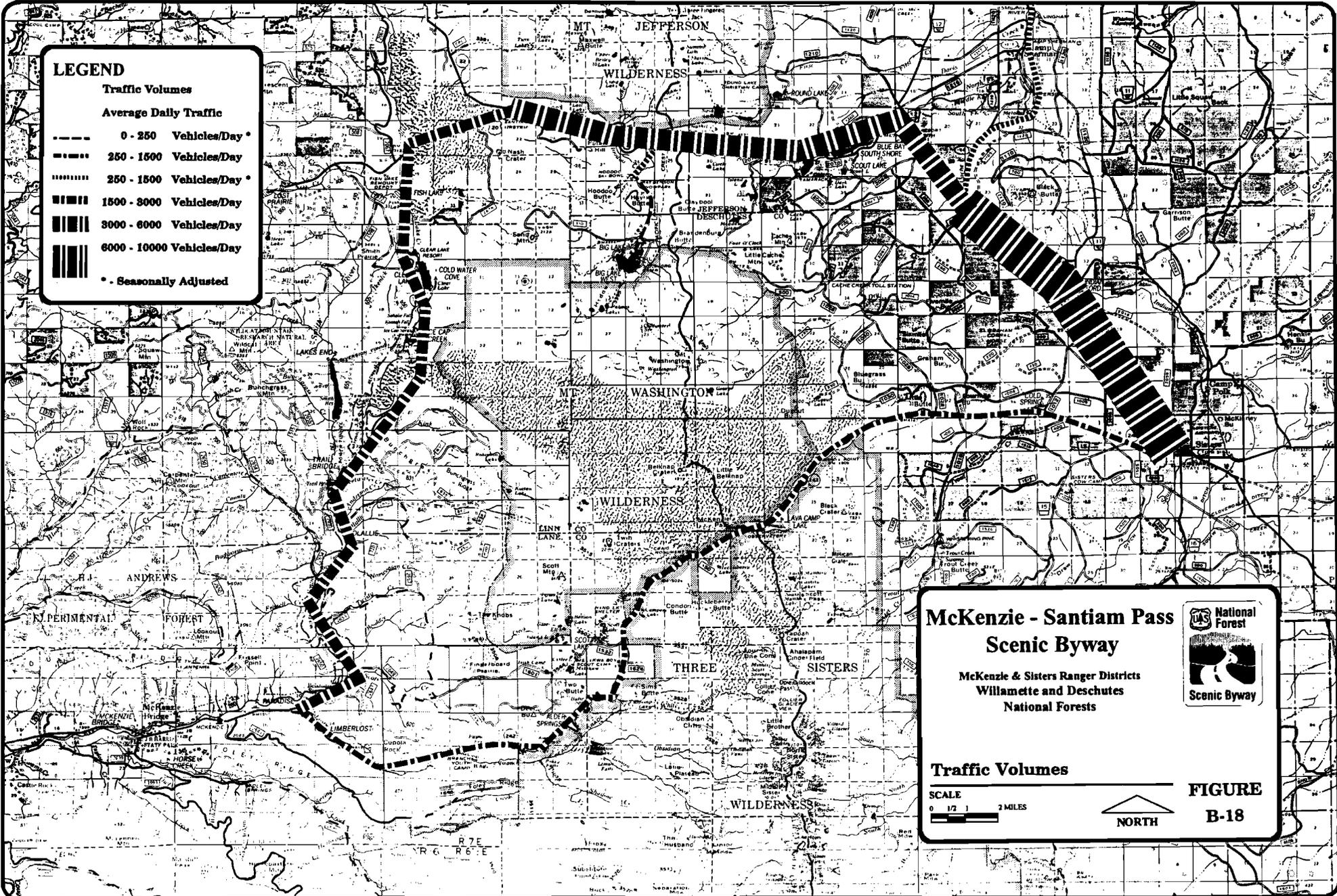
Land and Resource Management Plan and Environmental Impact Statement, Deschutes National Forest, Bend, Oregon, 1990.

LEGEND

Traffic Volumes

Average Daily Traffic

- 0 - 250 Vehicles/Day *
- 250 - 1500 Vehicles/Day
- 250 - 1500 Vehicles/Day *
- ||||| 1500 - 3000 Vehicles/Day
- ||||| 3000 - 6000 Vehicles/Day
- ||||| 6000 - 10000 Vehicles/Day
- * - Seasonally Adjusted



**McKenzie - Santiam Pass
Scenic Byway**

McKenzie & Sisters Ranger Districts
Willamette and Deschutes
National Forests



Traffic Volumes

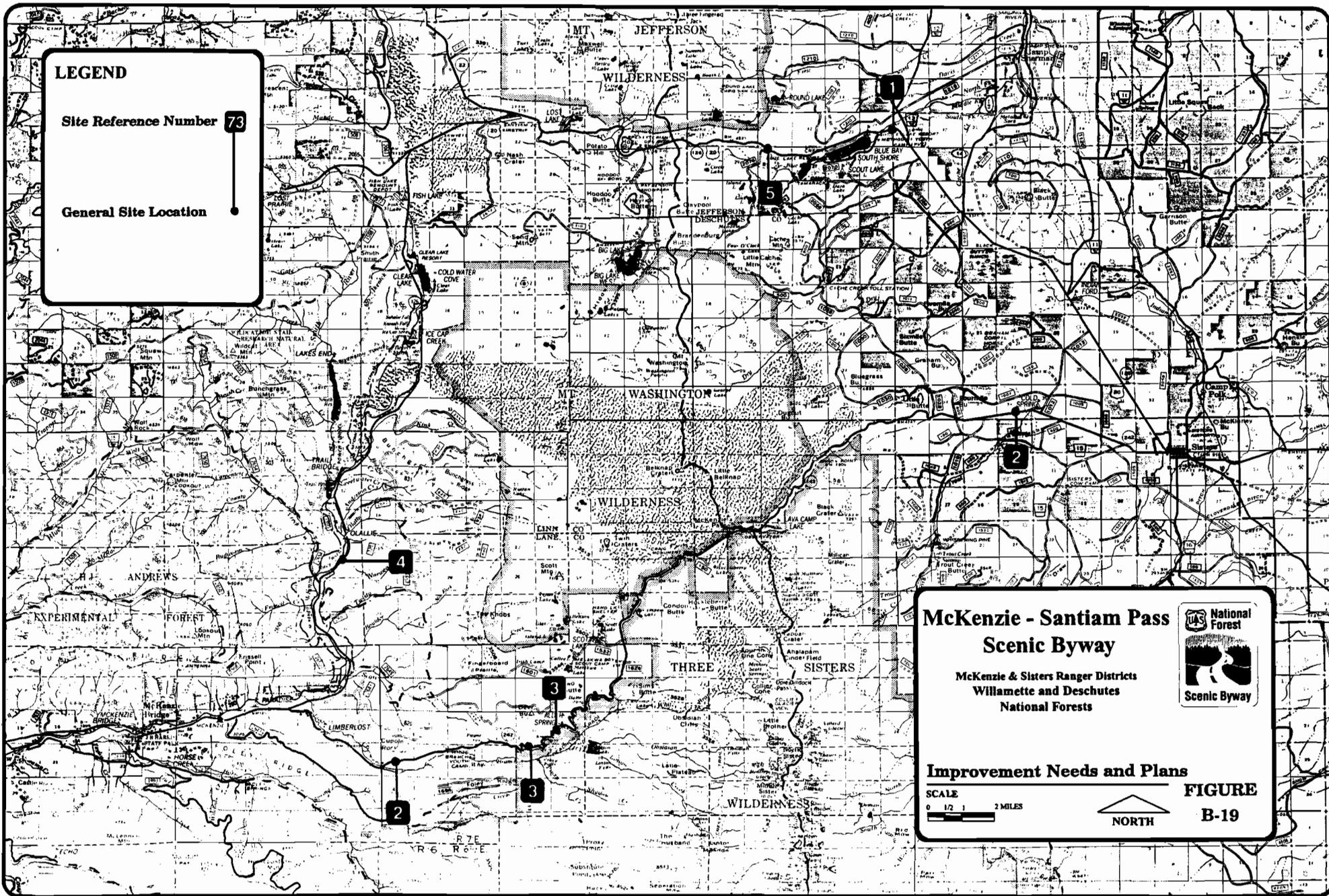


**FIGURE
B-18**

LEGEND

Site Reference Number **73**

General Site Location

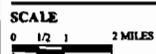


**McKenzie - Santiam Pass
Scenic Byway**

McKenzie & Sisters Ranger Districts
Willamette and Deschutes
National Forests



Improvement Needs and Plans



**FIGURE
B-19**

Appendix C: Partnerships - Working With Others

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PARTNERSHIPS

WORKING WITH OTHERS

D. LEE

MARCH 1991

PARTNERSHIPS

WORKING WITH OTHERS

One of the primary barriers to establishing partnerships, ie., sharing resources to accomplish some good in which all parties thereto will benefit, is (1) our managers' and sometimes our support personnel's lack of knowledge of authorities to enter into partnership. In light of the emphasis on partnerships, the objective of this paper is to provide employees a more comprehensive view of working with others, clarify opportunities and provide a basis so that consistency may be applied. To accomplish this in the most effective manner, employees must understand the authorities available, and use some "rules of thumb" for accomplishing partnerships. In any case, partnerships must be accomplished in a prudent, businesslike manner and must be consistent with sound financial controls. In order to understand where we are and where we are headed, we need to first examine the past.

To accomplish our mission, we make many different kinds of agreements or arrangements with other Federal Agencies, States, local governments and private parties. Prior to 1977, we followed different policies in the making of such agreements. Basically, we entered into cooperative agreements with others in any instance where there was mutuality of benefit even if we paid the lions share of the cost. Mutuality of benefit generally overrode cost-sharing. In or around 1977 it became apparent that there was a need to distinguish Federal Assistance (ie. Grants and Cooperative Agreements) from Federal Procurement and thereby standardize usage and clarify the meaning of legal instruments which reflect such relationships. Looking at the Government as a whole, there was apparently much inconsistency in the use of "contract," "grant," and "cooperative agreement," which led to operational inconsistencies, confusion, and inefficiency for awardees and Federal Agencies. In some cases assistance documents were used to preclude the competitive nature of procurement contracts. A commission on Government procurement then concluded that a reduction of these problems was feasible and necessary through legislative action. From this came the Federal Grants and Cooperative Agreements Act of 1977 (31 U.S.C. 6301-6308)(FGCA).

The FGCA requires that we make policy decisions on the classification of our transactions, considering specific laws and authorities. Specifically, the FGCA "promotes an increased discipline in selecting and using procurement contracts, grants and agreements," In essence, the FGCA mandates that absent specific authority to enter into an assistance transaction or a transaction legally recognized as not under the purview of the FGCA (**SEE EXHIBIT 1**), that a procurement transaction shall be done.

Because of the passage and implementation of the FGCA, we lost most of our flexibility to enter into cooperative agreements as we defined them prior to the Act's implementation. Immediately after passage of the FGCA, under the National Forest System, we didn't have much authority other than procurement contracts to work with others regardless of mutuality of benefit or cost-sharing. Except for the exemptions from the FGCA for Cooperative Road Maintenance, Cooperative Law Enforcement, and Cooperative Fire Agreements, most work had to be accomplished by procurement contract.

In many instances, procurement contracts are not the best instrument to do projects with others, especially in situations where there is mutuality of benefit and cost-sharing without profit motive. Required labor laws and termination provisions applicable to procurement contracts are often not in consonance with the spirit of mutuality of benefit that exists in all partnership arrangements.

In view of these needs, we have been researching possible latitudes concerning the interpretation of the FGCA and have submitted a legislative proposal to Congress to recognize partnerships that result in other than procurement contractual relationships, ie., Challenge Cost-share.

Under the FGCA as it is presently interpreted, and in accordance with newly acquired authorities, one basically has three choices:

1. If there is specific authority and appropriated funds available for this use, one may enter into an assistance transaction in the form of a grant or cooperative agreement, ie., depending upon the degree of our involvement and subject to the various Office of Management and Budget (OMB) cost and administrative regulations.
2. Under specific authority one may enter into a cooperative arrangement (different from a cooperative agreement), ie., Participating or Challenge Cost-share Agreement or other transaction specifically exempt under the Act or by entering into a transaction that has been exempt from the FGCA by the the Office of Management and Budget (**SEE EXHIBIT 1**). In these cases, the Federal Acquisition Regulation and OMB regulations do not necessarily apply, however, sound financial controls apply.
3. One shall enter into a procurement contract where we directly benefit and in situations where neither assistance nor other instrument are authorized or where we decide that its use is appropriate.

partnership in a broad sense to include "all those who share a common interest with the Forest Service in National Forest values and the relationships they have with the agency in pursuit of their interests... ." Partnerships connotes a sharing of resources to accomplish some good by which all partners thereto will benefit. They may include any individual, organization, or agency interested in supporting, through funding, labor or supplies, any project identified by us or proposed by them that will benefit all parties. This concept by itself has not created any new authority, but it created the need to examine and use any existing authority including volunteer, collection and participating agreements where appropriate and to request new authorities. Challenge Cost-share agreements as well as Memorandums of Understanding may be used. A procurement contract, in and of itself, is not a partnership for the mutual benefit since we are obtaining goods or services for the agency's direct benefit to accomplish its mission, but it is a method of doing work as support with other methods or where other authorities don't reach.

PARTNERSHIPS

Partnerships should include the following:

1. Mutual interest in some goal or value
2. A state of participation or sharing
3. Voluntary participation
4. A specified relationship between the parties, ie., an agreement (instrument)
5. Mutual benefit for nonmonetary consideration (no profit motive either present or future)
6. Cannot establish a conflict of interest

A number of possible methods exist for developing partnership agreements. Misinterpretation or misunderstanding of methods and processes occurs when people try to choose from memorandums of understanding, grants, volunteer agreements, Challenge Cost-share agreements and other processes. Some people don't know about the various authorities and others just don't know who to turn to for "expert" assistance. This lack of knowledge can result in lost partnership opportunities, frustrations, improper or illegal procedures, poor relationships, and ineffective partnerships.

The agency has come a long way in the last few years and, with the advent of Challenge Cost-share authority, adequate tools do exist for forming partnerships. As with anything new, such as Challenge Cost-share authority, some confusion is inevitable. Part of the confusion is in the processes, including what constitutes a partnership and the concepts applicable to developing it. This paper attempts to provide a simple, consolidated information base to be used to choose the proper method to accomplish partnerships.

There are many examples of partnerships throughout the Forest Service. Many of these relationships which were previously termed "cooperative efforts" are now recognized as partnerships. The majority of these partnerships are documented with some form of agreement. Partnerships may be formed in situations where the partner(s) wishes to contribute/donate **directly** (pay to) the Forest Service. In these instances, we may collect the money, if necessary match with our share, and accomplish the work by force account and/or

procurement contract. Under other circumstances, a partner may wish to provide for their share of the project work (**contribute indirectly**). Depending upon the circumstances, we may enter into a Challenge Cost-share or Participating Agreement. In other instances, partnerships may be formed when we pay all the costs or where no financial obligation is created, but are nevertheless, mutually beneficial.

However, prior to matching a contemplated partnership to an appropriate agreement, the first consideration is whether a legitimate partnership base exists, i.e., "What is the fundamental relationship?" If so, the potential for implementing and completing a successful partnership must be determined. When making this determination, units should consider following some basic guidelines:

1. Does the contemplated activity include a mutual interest in some goal or activity, a state of participation or sharing, voluntary participation, nonmonetary mutual benefit, and a demonstrated need for both the Forest Service and the public?
2. Have the appropriate administrative personnel been involved prior to any concrete discussions with the other party to determine the fundamental nature of the relationship and the proper method to pursue?
3. Is there legal authority for the cooperative activity?
4. If appropriated funds will be used, can they be expended for the contemplated activity?
5. Is there a potential conflict of interest or the appearance of conflict of interest? No gifts may be accepted from an "interested party;" an interested party being an entity whose interests may be affected substantially by the Forest Service, e.g., a future contract, etc..
6. Will the organization be used simply as a "strawman" wherein we would contemplate using them to accomplish something indirectly that we are forbidden to do directly?
7. If the relationship is that of a gift, has one considered the donative intent? If there are conditions to the gift, what are the nature of the conditions? Will the acceptance of the gift imply endorsement of the gift or the giver or impose any obligation on the part of the Forest Service to provide the giver with data or information which infers preferential treatment?
8. Is the partner capable of meeting its obligations; does it possess financial capacity and management skills to accomplish agreed upon objectives?
9. Is the project consistent with the terms of the respective forest land management plan or should the plan be amended to include the contemplated activity?
10. Can the unit follow through on all aspects of the contemplated work, not only project implementation but also planning, continuing administration, long-term maintenance, etc.? Can the project be reasonably achieved with the resources (including financial) available at

the time of implementation? Can the project be broken into increments if all the funding is not allocated at the same time?

11. Is the project timely? Does it fit in with current objectives?

12. Has a project coordinator been assigned? Can this person provide long-term support or direction to the effort?

13. Is there sufficient lead time to acquire funding, materials, approval for printing or video production, etc. if these are our responsibility?

14. Have the appropriateness and setting of the activity on National Forest System lands been considered?

A list of the various instruments to document partnerships, the authorities and applicability follow:

Collection Agreements

Collection agreement is the instrument used when money, and/or property are contributed directly to the Forest Service. Major situations are addressed below.

Donations/Grants/Contributions

The Forest Service may encourage (solicit) grants, donations, contributions or other awards of funds to finance Forest Service activities if the primary purpose is for the general public benefit and does not involve conflict of interest. (FSM 1584.03)

Donations/Contributions are authorized by several Federal laws and can take the form of money, real or personal property. These are considered charitable for tax purposes if made to the United States for exclusively public purposes. (26 Stat. 170)

- 1. Cooperative Funds Act of June 30, 1914 (16 USC 498) Ref: FSM 1584.11.** --Work must be investigations, protection, improvement of National Forests
 - Only on lands with National Forest Status
 - Forest Service must do work by either force account or procurement contract
 - Contributions must be voluntary
 - Overhead can be waived
 - Funds must be deposited before work begins
 - Funds must be accounted for separately by type of donation
 - Surpluses must be refunded to the depositor

EXAMPLE: Monies collected to improve National Forest lands, such as the Greater Yellowstone recovery effort.

2. Acceptance of Gifts Act of October 10, 1978 (7 USC 2269) Ref: FSM 1584.16.

--Can accept, receive, hold and utilize and administer gifts, bequests or devises of real and personal property to carry out functions.

--Acceptance of gift/donations may not be conditional upon endorsement of the donor's firm or product.

EXAMPLE: Monies contributed by the Chrysler Corporation to help fund signing for the Scenic Byways program.

3. Forest and Rangeland Renewable Resources Research Act (16 USC 1641 -1646) Ref: 1584.12.

--Authorizes the acceptance of contributions to conduct research activities. Donations can be money, real and personal property.

--Surplus funds must be refunded to the depositor.

EXAMPLE: Contributor may make funds available to pay the costs of any research work performed by the Experiment Station including indirect costs.

4. Granger-Thye Act of April 24, 1950, 16 USC 572 Ref: FSM 1584.13.

--Can accept contributions for the administration, protection, improvement, reforestation, or such other kinds of work the Forest Service is authorized to do on its lands for the benefit of the public.

EXAMPLE: A Special Use permittee (Ski Resort) provides funds to cover the cost of avalanche control.

5. Federal Technology Transfer Act of 1986 (P.L. 99-502) REF: FSM 1589.01.

--Can accept funds from collaborating partners and they may also share personnel, facilities, equipment and other resources toward the conduct of specified research or development efforts. **(Form of collection, however, documentation would be done under a Cooperative Research and Development Agreement)**

****IMPORTANT POINT****

Whether the relationship is a gift is dependent upon the existence of donative intent, ie., What is the fundamental relationship that will occur? Will we retain control over the project? If there are conditions to the gift, what are the nature of the conditions? For example, acceptance of a gift to accomplish project work would not be proper if the gift were contingent upon us giving assurances that, for example, a commodity extracted as a result of the project was earmarked specifically for the donor. However, conditional offers of gifts or of money may be referred to the Assistant Secretary for Administration for acceptance or rejection. In any case, no gift shall be accepted from an "interested party" as defined in 36 CFR 0.735-12. An interested party is an entity or individual whose interests may be affected substantially by

the Forest Service, eg., a future contractor, or a special use permittee who obtained the use permit under competitive procedures.

Volunteer Agreement

Volunteers in the National Forest Act of 1972, (16 USC 558) Ref: FSM 1830.

--May accept the services of individuals without compensation, although incidental expenses may be provided for. **(This is a form of collection since the authority allows us to legally receive non-reimbursed services, however, one would use a volunteer agreement.)**

EXAMPLE: Rancher wants to provide equipment and labor (volunteer) to enhance access road which is under Forest Service jurisdiction. Forest Service could pay for fuel as an incidental expense and provide road materials.

Challenge Cost-Share Agreements

This agreement may be used as a part of the Challenge Cost-Share Program when it is contemplated that the Challenger(s) (or the Challenger(s) and the Forest Service jointly) will perform the work in furtherance of Forest Service functions or activities, and the Forest Service reimburses them for part of the costs of material and/or labor. These agreements also may be used as a means for the Forest Service to accept non-reimbursed services from other than individuals which are not authorized under the Volunteers in the National Forests Act of 1972.

Challenge Cost-share Agreement, P.L. 101-512,

-- We may enter into a Challenge Cost-share (CCS) agreement without regard to the Federal Acquisition regulation or the administration and cost requirements for Federal Financial Assistance awards, but financial control shall be maintained. (Sample Agreement-FSH 1509.11, 97.1)

--May be entered into with public and private agencies, organizations (profit or nonprofit), institutions and individuals. (See ID No. 21, FSM 1580)

--Currently permitted under the FY 1991 Appropriations Act to jointly plan, develop, and implement projects to enhance Forest Service activities.

--Entails "matching" of Federal funds by various organizations to accomplish specific projects. Matching shall be accomplished on an annual program basis rather than by project.

--Challengers contribution to the matching requirement may be satisfied by cash, real or personal property, services and/or contributions for which it incurs no cost, such as volunteer labor **(however, volunteer labor shall not be reimbursed)**

--Financial plan required prior to the start of work (must reflect challenger contribution to any on the ground work).

--Improvements accomplished with the use of National Forest System appropriation must be on land under Forest Service jurisdiction.

EXAMPLE: A nonprofit organization supporting wildlife habitat enhancement wishes to provide their equipment and operators as their contribution to a project for wetlands rehabilitation. To accomplish the work the Forest Service would use NFS appropriated funds to pay a portion of the operator's costs as their contribution. A CCS agreement is appropriate in this case if the improvement is on land under Forest Service jurisdiction or long term lease and the contributions of the parties are approximately equal.

****IMPORTANT POINT****

Any discretionary appropriated funds are available to use to enter into a CCS agreement when its use is appropriate. Projects under CCS agreements are to be accomplished by the Forest Service and/or the Challenger. When the Challenger cannot perform the work, but has the necessary funds to accomplish their share of the project, we should accept their contribution and perform the work ourselves or by contract. CCS agreements shall not be used to circumvent other Federal regulation. Government Printing Office (GPO) regulations would supercede this authority if Federal funds will be used for printing, but this does not preclude the use of a CCS agreement to cooperatively produce a "camera-ready" copy for printing. Audio visual productions that are strictly regional in nature may be produced under a CCS agreement if the Challenger has the capability to develop the Government video in-house and otherwise meets the criteria for a CCS agreement. CCS agreements may be used to develop Challenger's videos if the resulting product furthers Forest Service functions or activities. It is not intended that this authority be used to circumvent procurement regulation when it is appropriate, eg., to allow the Challenger to accept our share of the project costs (Federal funds) and contract with a third party to preclude Department of Labor regulations, specifically the Davis-Bacon minimum wage requirements mandatory when Federal funds are used to construct public works.

Participating Agreement

Participating agreements are appropriate where the Forest Service and partner(s) wish to perform work from which they will accrue mutual benefit (non-monetary). Types of projects for which this authority may be used for are specifically mentioned in the Act.

Cooperative Funds and Deposits Act of December 12, 1975, (16 USC 565 a1-a3), P.L. 94-148, Ref: FSM 1589.1.

- May be used for pollution abatement equipment and facilities, manpower and job training programs, development and publishing of environmental education and forest history, and forestry protection including fire, TSI, debris removal and tree thinning.
- Participants must share a mutual interest other than monetary considerations.
- Both parties shall contribute resources to the endeavor.
- (Note: This authority is generally used for Human Resource Employment Agreements - See FSM 1585)

--Financial plan required prior to the start of work.

EXAMPLE: Partner wishes to publish a non-Government brochure concerning enhancement of elk habitat and solicits support from the Forest Service. Partners share in the total cost will be substantial. Since a brochure will be published, is environmentally educational and is mutually beneficial, we may enter into a participating agreement to support the effort.

****IMPORTANT POINT****

This authority may be used to cooperatively publish Forest Service and others' brochures and other publications if it fits within the parameters of the Act; mutually beneficial and for environmental education or Forest history. However, if the Government's contribution to the project is substantial (50% or more) the printing will have to be done under GPO procedures. Contributions should always be balanced against the benefits derived.

Research Joint Venture Agreement

Food Security Act Amendment - Contract, Grant and Agreement Authority, (7 USC 3318) Ref: FSM 1589.

--Pool resources in support of research activity of mutual interest(**RESEARCH FUNDING ONLY**)

--Parties must share cost (minimum 20% of total project costs)

--May enter into this agreement without regard to the Federal Assistance regulation; however, sound financial control shall apply.

EXAMPLE: May enter into agreement with a University to support research of mutual benefit.

Cooperative Research and Development Agreements

Section 5 of the Technology Transfer Act of 1986 (15 U.S.C. 3710(g)(1)(B)FSM 1589.01

--Government may share nonfinancial resources and can grant collaborators exclusivity to patents

--Government inventors and their laboratories (the Forest Service is determined to be a laboratory for purposes of the Act) may receive royalty payments on any commercial product developed and sold that was based on their invention

--Funds may be transferred from the collaborator to the Government

--Agreement should contain provisions to control issues such as data rights, property ownership, facilities sharing and usage, and rights to future inventions.

The following discussion centers around agreements that may be entered into where we may pay or where no financial obligation is created, but are nevertheless, mutually beneficial.

1. *Research Cost-Reimbursable Agreement*

Food Security Act Amendment - Contract, Grant and Agreement Authority, (7 USC 3319(a)) Ref: FSM 1589.

--Acquire goods and services, including personal services, to carry out agricultural research of mutual interest.

--Typically a procurement type of transaction although both parties will benefit nonmonetarily

--May be done with a State Cooperative Institution only (**RESEARCH FUNDING ONLY**)

EXAMPLE: The Forest Service could pay for computer data services done by a State Cooperative Institution in which the results would benefit both.

2. *Memorandum of Understanding, Ref: FSM 1588.03*

--Is an agreement with the purpose of coordinating efforts to eliminate duplication and waste.

--Each party carries out its separate activities in a coordinated and mutually beneficial manner.

--No funds may be exchanged or obligation(s) created.

--Cannot be written to preclude other authorities and the Memorandum, by itself, cannot limit competition or other procurement procedures.

EXAMPLE: Forest Service and National Weather Service cooperate in the preparation and distribution of snow avalanche bulletins. Each agency assumes their own costs.

3. *Interagency Agreement (Purchase Order, Letter of Agreement-Instrument varies depending upon agency requirement), Ref: FSM 1587.03.*

--Used with other Federal Agencies.

--Generally when they provide benefit to the Forest Service or provide material savings of public funds through elimination of duplication, etc.

--Generally cite the Economy Act, (31 USC 1535)

--Intraagency--Form AD-672 may be used.

EXAMPLE: Procure services from another Federal agency to provide services which we do not possess the capability to do.

Federal Assistance

Grants and cooperative agreements form partnerships since we are essentially using our resources and sometimes some of the other party's resources to stimulate and support activity of mutual benefit.

Grants and cooperative agreements both transfer a thing of value for the purpose of support or stimulation, but a distinction is made between the two depending upon the degree of involvement by the parties to the transaction. When we do not expect to be substantially involved the instrument to use is a grant. When we expect to be substantially involved the instrument to use is a cooperative agreement.

One must have specific authority and appropriations available for this use to enter into one of these documents and those are listed in FSM 1581.01. The National Forest System is very limited here.

Procurement Contracts

The following discussion centers around using procurement contracts to sanction partnerships where the benefit to the other party is nonmonetary.

A procurement cost-share contract is the appropriate instrument to document the rights and responsibilities of the Government and others who accrue a nonmonetary benefit from a project of mutual benefit. It is a method of doing work with others where other authorities don't reach.

Official Forest Service Insignia (36 CFR 264, Subpart A)

The Chief may authorize the use of the insignia or shield which is reserved for the official use of the Forest Service. Its use will be primarily for identification purposes.

The Chief may authorize other uses of the insignia such as educational public service use or for commercial purposes. Use for noncommercial educational purposes may be granted without charge when the purpose will extend public knowledge and understanding of the Forest Service. Any commercial use requires a license be granted and a royalty payment made for its use. An in-kind payment may be granted in some cases. Licenses would probably not be granted where the use of the insignia might conflict with identification purposes or for its use on a product that we also produce. For example, a license probably would not be granted for a commercial entity to use the insignia on a cap since its use there might conflict with the official uniform cap and could cause identification problems. A license probably would not be granted to authenticate a commercially produced video or publication, since we would reserve that right to identify our own. One may use the insignia consistent with a byline connotating our cooperation with a cooperator's publication, for instance.

Audio Visual and Printing

Audio visual and printing are highly regulated for various reasons too numerous to detail in this paper. However, this should not preclude creative endeavors because many times they may be accomplished satisfactorily. Get your Administration experts involved prior to initiating any type of arrangement. Typically, you will be asked to provide answers to the following questions so that the best, most efficient method may be determined:

Nature and extent of the contemplated contributions of the parties
Whose publication or video will it be? The partner's or the Forest Service?
Is the publication or video national or regional in nature?
Copyright?
What authority is contemplated and what funding will be used?
How will the parties benefit?
Will the product be sold? By whom?
Do you contemplate use of the FS insignia?
Does the partner have the capability to produce?
For printing--Who/how do you propose to print the product? More than \$1000?
Estimates of cost and substantiation of estimate

Summary and Future Trends

The strength and success of the Forest Service depends a great deal upon our formulating and nurturing partnerships. Partnerships reflect the Chief's philosophy that we can't go it alone, and he has placed emphasis on them by placing it as a key element in his "6-Point Working Agenda." We are developing a solid track record of partnerships. It is important to allow people to act on their vested interest in the success of the Forest Service. They are successful when we are and vice versa.

There are many examples of partnerships and volunteerism on every National Forest. The public is expressing increased support for and concern about the management of their public lands and this is resulting in increasing spontaneous donations, partnership opportunities and corporate sponsorship of programs. Some of these offer significant amounts of money and/or supplies/services. We must be cognizant of the types of transactions that we can enter into and be careful not to endorse any product (See DR-1400-1, June 8, 1988) or create a conflict of interest including the appearance of a conflict of interest.

As we mention earlier, the partnership concept did not create any new authority, but created the need to examine and use any existing authority. The prior discussion has detailed methods available to us. What can we do in the future to make things easier?

To help alleviate some of the red tape that we encounter with the process of entering into partnerships, we have submitted a legislative proposal to transfer the Challenge Cost-Share authority from the current Appropriation to permanent, statutory law. The proposal was approved by the Chief and is being reviewed by the Department. It's on track for the 102nd Congress.

Another helpful hint is to get your administrative contact involved at the initiation of discussions or prior to any discussions with a third party. It's better to know your alternatives than to try to change something at a later date. Plenty of lead time is a must.

EXHIBIT 1

NONAPPLICABLE

UNDER THE FGCA

1. SALE OF GOVERNMENT PROPERTY AND SERVICES FOR FULL VALUE (IE., TIMBER SALES)
2. COLLECTION AGREEMENTS FOR FULL VALUE, DEPOSITED OR REIMBURSED (IE., G-T ACT, 6/30/14, TRUST FUNDS)
3. ALL TRANSACTIONS BETWEEN FEDERAL AGENCIES (IE., ECONOMY ACT)
4. LEASE, LICENSE, AND PERMITS WHERE THE GOVERNMENT RECEIVES FULL VALUE OF THE TRANSACTION (IE., GRAZING, RECREATION USE)
5. TRANSACTIONS WHERE GOODS, SERVICES, OR MONEY FLOW TO THE FOREST SERVICE RATHER THAN FROM THE FOREST SERVICE.

OMB EXEMPTIONS

1. COOPERATIVE LAW ENFORCEMENT AGREEMENTS
2. COOPERATIVE FOREST ROADS AGREEMENTS
3. COOPERATIVE FIRE PROTECTION AGREEMENTS

EXEMPT BY SPECIFIC ACT

1. PARTICIPATING AGREEMENTS
2. CHALLENGE COST-SHARE AGREEMENTS
3. RESEARCH JOINT VENTURE AGREEMENTS
4. RESEARCH COST REIMBURSABLE AGREEMENTS
5. COOPERATIVE RESEARCH AND DEVELOPMENT AGREEMENTS