

4.9 Transportation

Affected Environment

The following section contains a discussion of the existing transportation infrastructure in the Restoration Project area. Transportation routes include federal highways, state routes, and county and private roads that provide access to or could potentially be affected by the construction, modification, or removal of facilities in the Restoration Project area. A discussion of nearby railroads and airports is also included. The major transportation corridors and state highways within the area are shown on Figure 4.9-1.

Regional Roadways

The area of potential effect for transportation resources within the Restoration Project area includes portions of northern Tehama and southern Shasta Counties. The Restoration Project area can be generally characterized as predominately rural, with agricultural and timber production the primary activities in the area. The area is transected by a number of primary transportation corridors of regional importance. Those major transportation corridors that are either within or that may be used to access the Restoration Project area include Interstate 5, Highway 99, Highway 36, and Highway 44. These corridors would be used by construction workers to access the local roadway system, which in turn provides access to the Restoration Project sites.

Local Roadways

As stated above, the Restoration Project area is transected by an extensive local roadway system providing access to the Restoration Project sites. This system includes county roads, most of which are paved, and private roads, which are of varying quality. Additional information on the local roads associated with access to a particular Restoration Project site that may be affected by construction, modification, or removal activities is provided below under the appropriate site-specific discussions.

County Roads

County roads expected to carry traffic for the project are listed in Table 4.9-1. The project would include intersection modifications to county roads at three locations: at Hazen and Manton Roads; at the new access road over BLM land located on Manton Road about 1,000 feet east of the existing PG&E access to Coleman Diversion Dam; and at the existing Manton Road access points to Eagle Canyon Diversion Dam. Reclamation is working to obtain road encroachment

permits for this work from Tehama County Public Works. The county roads would be used to access the private roads that provide access to the worksites.

Private Roads

The access roads to the sites include numerous private roadways, which accommodate localized traffic (Tehama County Road Department 1997). Many of the access roads are unpaved and would need to be modified or upgraded before construction begins. PG&E has easements for access to the hydroelectric project sites over the private roads that they don't own. These private roads would require improvements and maintenance to allow construction to proceed safely and efficiently. Road work would include clearing vegetation, regrading, graveling, limited paving, fencing, and limited drainage improvements, such as culverts.

Other Area Transportation Facilities

Other transportation facilities in the area include railroads and airports. The Southern Pacific Railway's main line, which runs to the west of the Restoration Project area, is its primary rail line from Sacramento, California, to Portland, Oregon. Rail services focusing primarily on freight-hauling services are available at various locations in Tehama County, including Red Bluff, Corning, Richfield, Tehama, Gerber, Vina, and Los Molinos. Rail spurs at these locations could be used to transport materials and supplies to the area.

There are four publicly operated airports in Shasta County: Redding Municipal Airport and Benton Airport, which are operated by the City of Redding; Fall River Mills Airport, which is owned by Shasta County; and Shingletown Airport, which is leased by Shasta County. There are two publicly owned airports in Tehama County: Red Bluff Municipal Airport and Corning Municipal Airport, both of which are owned by their respective cities.

As discussed in detail in Chapter 3, "Project Alternatives," the use of helicopters would likely be necessary to transport materials to and from some of the more remote sites (Reclamation 1999).

Restoration Project Site Access

The following section provides information on access routes to the Restoration Project sites. The eight Restoration Project sites included in the Five Dam, No Dam, Six Dam, and Three Dam Removal Alternatives are accessible by 13 major federal, state, local, and private roadways (Table 4.9-1). The roadways shown on Figure 4.9-1 are the state and local routes; Figure 4.9-2 identifies Restoration Project site access roads. Additional details on the removal and construction

activities at each site are included in Chapter 3, “Project Alternatives,” and Section 4.2, “Botanical, Wetland, and Wildlife Resources,” of this EIS/EIR.

Table 4.9-1. Access Routes to Restoration Project Sites

Federal	State	Local
Interstate 5	SR 36	Ash Creek Road (Road A17)
	SR 44	Battle Creek Bottom Road
	SR 99	Forward Road
		Hazen Road
		Lanes Valley Road
		Manton Road (Road A6)
		Manton School Road
		Ponderosa Way
		Rock Creek Road
		Manton School Road
		Spring Branch Road
		Wildcat Road
	Wilson Hill Road	

North Fork Battle Creek

The Restoration Project sites located on North Fork Battle Creek include Wildcat, Eagle Canyon, and North Battle Creek Feeder Diversion Dams. Although minor increases in traffic are expected, Battle Creek Bottom Road, Wilson Hill Road, Wildcat Road, Manton Road, Highway 36, Highway 99, and Interstate 5 would be affected. Ash Creek Road and Highway 44 are less likely to be affected. Not included are the private roads that would be impacted by construction vehicles accessing these sites after vehicles leave the public roadways. Access to the construction sites located on North Fork Battle Creek is described below.

Wildcat Diversion Dam

Wildcat Diversion Dam is located about 6 miles west of Manton and about 1 mile south of Battle Creek Bottom Road. The site is accessed by traveling west along Battle Creek Bottom Road to an unpaved private road and then traveling down the private road for approximately 1 mile. This road terminates on the north rim above the dam. A long, narrow foot trail provides access from the north rim to the right abutment of the dam. The unimproved road leading to the north rim above the dam terminates in a 100- by 50-foot parking area that would be used for parking by workers who would then get to the site via the foot trail. Smaller equipment and tools would be hand-carried down the access trail.

All contractor access would be from the north side. PG&E would concurrently work on the south rim to remove power lines in association with the Restoration

Project. PG&E has legal access to private roads accessing the south rim under existing easements.

Wildcat Diversion Dam is reached by driving north from the PG&E Manton Service Center along Wilson Hill Road to Battle Creek Bottom Road. At about 3.5 miles southwest of their junction an unimproved private road leads to a parking/turnaround area about 1 mile south of Battle Creek Bottom Road at the top of the plateau. There is no vehicle access to the site from the north plateau.

A narrow, steep 500-foot-long path descends approximately 110 feet and provides access to the dam and diversion facilities on the right abutment. There is no foot or vehicle access from the top of the left abutment down to the dam even though PG&E owns the land.

The overhead powerlines and poles that drop down to the dam can be reached along an access road that turns off of Manton Road about 1 mile east of Wildcat Road. The pipeline portions of Wildcat Canal on both the north and south sides of the creek have no vehicle access except at the transition structure. The pipeline is reached by walking in from the diversion dam or the transition structure.

Wildcat Canal is reached by driving west from the PG&E Manton Service Center along Manton Road about 6.5 miles to Wildcat Road. About 1 mile north of their junction, an unimproved private road parallels the canal to the east for about 0.5 mile and leads to a parking/turnaround area near the transition structure. The section of canal to the west of Wildcat Road has no developed access road adjacent to the canal.

Eagle Canyon Diversion Dam

Eagle Canyon Diversion Dam is located about 3 miles west of Manton and about 1 mile north of Manton Road. The site is accessed by traveling down Manton Road from SR 36 to an unpaved private road and then traveling along the private road for about 1 mile to the south rim trailhead. This area would serve as a parking lot for workers, all of whom would access the site via a foot trail. The intersection of Manton Road and the private road would be improved for safety purposes and the private road graded and gravelled to prepare them for construction traffic.

The worksites associated with the spring collection improvement work would be reached from three foot trails located along the south canyon rim within 3,000 feet downstream of the diversion dam. These trailheads are reached over unimproved roads that spur off of the main access road to the diversion dam. These roads may be graded, but would not be graveled, to prepare them for construction traffic.

Because there is no road down to the Eagle Canyon site, all heavy equipment would be flown by helicopter from the staging areas to the site. Equipment would be transported by truck to the parking area, where it would be off-loaded

and then lifted by helicopters to the dam site. Smaller equipment and tools would be hand-carried down the access trail.

Eagle Canyon Diversion Dam is primarily reached by driving southwest from the PG&E Manton Service Center along Manton Road about 3 miles to a turnoff onto private property. An unimproved road proceeds northerly about 1 mile to a small parking area at the southern top of the plateau. A steep, 900-foot-long footpath including stairs, descends approximately 160 feet and provides access to the dam and diversion facilities. Three additional unimproved roads split off the main access road and lead to turnaround areas along the top of the plateau where trails with stairs are used to descend to points along the tunnels, flumes, and spring collection facilities of Eagle Canyon Canal.

The northern top of the plateau above the dam can be reached by driving north from the PG&E Manton Service Center along Wilson Hill Road to Battle Creek Bottom Road. At about 1.5 miles southwest of their junction, an unimproved private road leads to a parking/turnaround area about 1 mile south of Battle Creek Bottom Road at the top of the plateau. There is no vehicle or foot access to the site from the north plateau. However, the area has been used to stage construction operations for performing various maintenance activities.

Eagle Canyon Canal is reached off of its intersection with Manton Road. To the north (upstream) of Manton Road the canal banks are narrow and limited to foot or small vehicle access. To the south of Manton Road a 0.7-mile-long access road parallels the canal to its termination at the Inskip Powerhouse penstock headworks.

North Battle Creek Feeder Diversion Dam

North Battle Creek Feeder Diversion Dam is the northeastern-most dam in the Restoration Project area. The dam is reached from private roads leading from Wilson Hill Road. Wilson Hill Road is reached by traveling Battle Creek Bottom Road from Wildcat Road. A lightly paved road runs from Wilson Hill Road to Volta Powerhouse 1, a gravel road leads from Volta Powerhouse 1 to the existing paved road to Volta Powerhouse 2, and an unpaved road leads Volta Powerhouse 2 to the west rim above the dam. From here, the work site is accessed via a footpath that leads from Volta Powerhouse 2, across a footbridge over the North Fork of Battle Creek, and along about 700 feet of platform running down the centerline of the existing flume. While providing access for personnel and light hand tools, the footpath does not provide sufficient access for construction equipment.

To provide access for heavy equipment, a new asphalt-paved access road is proposed to be installed. It would be used both for construction access and for long-term operation and maintenance. The road would originate at the terminus of the existing private road and would run down the face of the canyon wall. Although helicopters would not land here, they may be used to lift equipment from the west rim area and deliver it to the dam site.

North Battle Creek Feeder Diversion Dam is reached by driving north from the PG&E Manton Service Center on Wilson Hill Road about 1 mile to a turnoff to the Volta 1 and 2 Powerhouses. A private road consisting of paved and unpaved sections about 0.8 mile long leads to a sediment basin at the top of the plateau above Volta 2 Powerhouse. A steep, paved section of access road incorporating one switchback then descends to a parking area at Volta 2 Powerhouse. A footpath begins at Volta 2 Powerhouse and leads across a footbridge over North Fork Battle Creek to the energy dissipation box. The dam is reached by walking upstream along approximately 700 feet of walkway running down the centerline of the flume. There is no vehicle access to the dam or feeder canal.

South Fork Battle Creek

The Restoration Project sites located on South Fork Battle Creek include Coleman, Inskip, South, Soap Creek, and Lower Ripley Creek Feeder Diversion Dams. Although minor increases in traffic are expected, Ponderosa Way, Forward Road, Hazen Road, Manton School Road, Manton Road, Highway 36, Highway 99, and Interstate 5 would be most likely affected. Not included are the private roads that would be impacted by the construction vehicles accessing these sites after the vehicles leave the public roadways. Access routes to the construction sites located on South Fork Battle Creek are described below.

Coleman Diversion Dam Site

The Coleman Diversion Dam site includes the Inskip Powerhouse bypass facility, Inskip Powerhouse tailrace connector, Coleman Diversion Dam, and their appurtenant facilities. Coleman Diversion Dam is located about 6 miles west of Manton. It is accessed from Manton Road about 0.4 mile east of Wildcat Road on an existing PG&E road that leads to the right abutment of the dam and Inskip powerhouse.

Construction equipment would be transported to the site along existing access roads. Access to the Inskip Powerhouse bypass facility and tailrace connector would be provided by separate routes. The penstock bypass work requires access to the upper and lower plateau areas. The plateau area would be reached by an existing road located approximately 1,000 feet east of the Coleman Dam access road. The plateau road would require development of a new intersection with Manton Road to assure safe and efficient construction access. This intersection connects to an existing unpaved road to the edge of the plateau. The upper end of the plateau would be accessed only by light vehicles from the existing road to the penstock headworks area (this road parallels Eagle Canyon Canal about 4,000 feet east of the Coleman Diversion Dam access road). Access to the tailrace connector site is the same as for the Coleman Diversion Dam.

The Coleman Diversion Dam/Inskip Powerhouse site is reached by driving west from the PG&E Manton Service Center along Manton Road for 6 miles (about 0.5 mile east of the intersection of Manton Road and Wildcat Road). A private, paved road descends in an easterly direction about 0.4 mile to the dam and powerhouse area. This relatively large and flat area was the site of the original

construction camp and powerhouse operator residences. There is vehicle access to dam and powerhouse. However, there is no vehicle access from this area adjacent to the creek up the steep hillside to the penstock header box area.

The penstock header box area is reached from an access road at the intersection of Manton Road and Eagle Canyon Canal about 1.7 miles east of the dam/powerhouse access road. This dirt and gravel road parallels the canal for about 0.6 mile to the Inskip Powerhouse penstock headworks area. The canal overflow wasteway is reached by crossing a bridge over Eagle Canyon Canal and another bridge that crosses the inlet forebay immediately upstream of the header box. A primitive road continues east 500 feet to the north bank of the wasteway channel about 100 feet from the gunite-lined overflow structure, which cannot be reached by vehicle. There is an unimproved access road along the south side of the penstock that extends to the edge of the plateau. From the end of this road the Willow Springs pipeline intake area can be reached by foot. The majority of this 1-mile-long pipeline can be reached only by foot. Between Manton Road and the penstock there is a rough road that follows the pipeline for a few hundred feet. This road begins off of Manton Road about 0.2 mile east of the dam/powerhouse access road.

Inskip Diversion Dam Site

The Inskip Diversion Dam site includes the South Powerhouse bypass tunnel, South Powerhouse tailrace connector, Inskip Diversion Dam and Canal, and their appurtenant facilities. Currently, PG&E accesses the Inskip Diversion Dam site via the paved South Powerhouse Road and a private road leading south from the South Powerhouse/Hazen Road intersection. A portion of this access route passes close to a residence and the speed limit is restricted. For the Project, access instead would be either along Manton School Road, which parallels South Powerhouse Road from Forward Road to Hazen Road, or via a constructed road that would connect Manton School Road with the private road described above.

From the intersection of Manton School Road and Hazen Road, a private road ("Old Ranch Road") proceeds south another mile to the top of the canyon. From the top of the canyon, a steep, narrow, winding, paved road continues down the hillside for about another mile to a parking area at the South Powerhouse. Access to the right (north) side of the dam is by a 1,400-foot-long foot trail above South Fork Battle Creek. The left (south) side of the dam can be accessed by four-wheel-drive vehicle over a concrete, low-water crossing of the creek adjacent to the powerhouse. A private dirt road parallels the creek for about 1,000 feet and terminates at the dam. There is no vehicle access across the creek at the dam site. Personnel can cross the dam crest on foot if the water levels are low enough.

During construction, a temporary access road would be established along the presently abandoned Old Ranch Road located about 2,000 feet east of the residential area south of South Powerhouse Road. This temporary road would allow construction equipment to safely bypass the residential area near South Powerhouse Road. Some grading, graveling, and installation of drainage features would be performed to allow efficient construction access while minimizing

disturbance to the environment. The remainder of the road to the South Powerhouse parking area would be maintained and repaired as needed during construction.

The Inskip Diversion Dam/South Powerhouse site is reached by driving south from the PG&E Manton Service Center along Manton Road, then south for approximately 1.2 miles on Manton School Road. From this intersection of Manton School Road and Hazen Road, a private dirt and graveled road proceeds south another mile to the top of the canyon. A portion of this stretch passes close to a residence and the speed limit is restricted. From the top of the canyon a steep, narrow, winding, paved road continues down the hillside for about another mile to a parking area at the South Powerhouse. This section of private road from Hazen Road to South Powerhouse is called the South Powerhouse Access Road.

Access to the right (north) side of the dam is by a 1,400 foot long foot trail above the South Fork Battle Creek. The left (south) side of the dam can be accessed by four-wheel-drive vehicle over a concrete, low-water crossing of the creek adjacent to the powerhouse. A private, dirt road parallels the creek for about 1000 feet and terminates at the dam. There is no vehicle access across the creek at the dam site. Personnel can cross the dam crest on foot if the water levels are low enough.

South Diversion Dam

South Diversion Dam is the southernmost facility in the Restoration Project area. The site is accessed by traveling from Manton Road at the town of Manton about 4 miles along the paved Forward Road to Ponderosa Way, then continuing along the gravel and dirt road for about 2.8 miles to a locked gate at the PG&E facility access road. The access road is about 2.5 miles long and terminates at a switchback turn and parking area. From the parking area, a footpath extends along the canal bank about 1,000 feet to the dam. Access road improvements would be necessary. Small access roads in the area may also be used to transport both personnel and small equipment to various locations along South Canal.

South Diversion Dam is reached by driving east from the PG&E Manton Service Center about 4 miles along Forward Road to Ponderosa Way. At about 3 miles south of their junction, an unimproved private road continues south another 2 miles to a parking/turnaround area adjacent to South Canal and 0.2 mile downstream of the dam. Road conditions vary seasonally but are generally steep, narrow, and heavily rutted, and require the use of four-wheel-drive vehicles.

There is no vehicle access to the dam site. The dam is reached by walking along the canal bank to the outlet of Tunnel 1. At this point a steep, narrow trail rises above the tunnel and ends at the top of a 25-foot-tall ladder that descends to the right abutment of the dam. The left abutment area could be reached by construction equipment and four-wheel-drive vehicles if an abandoned low-water crossing of the South Fork located near the parking/turnaround area is reestablished.

South Canal is reached over several private roads that branch off of Ponderosa Way and South Powerhouse Road. The first private access road is the route described above that branches off of Ponderosa Way and provides access to the dam and the easterly most reaches of the canal.

A second private access road branches off of Ponderosa Way near the Bluff Springs area about 1.8 miles south of Forward Road. This road splits into 2 branches that provide access to the middle and western portions of South Canal. The southerly branch extends 1.5 miles to the outlet of Tunnel 5 and to Soap Creek Diversion Dam. This road then continues westerly approximately 1.2 miles along the canal (some portions are well above the canal, other portions are along the canal bank) to the inlet of Tunnel 6 where it reaches a dead end. The westerly branch travels along the plateau above the South Fork and several hundred feet north of South Canal. This westerly branch rejoins the South Canal 2.5 miles to the west. An access point down to the area around the outlet of Tunnel 6 begins about 1.3 miles west of the Bluff Springs branch and heads south about 0.4 miles where it dead ends. Vehicle access does not exist between the outlet of Tunnel 6 and 600 feet downstream of the outlet of Tunnel 9. The remaining 1.2-mile stretch of the westerly branch that joins the private South Powerhouse Access Road is along the South Canal bank. Continuing along the canal alignment (actually above Tunnel 10) to the west of the private South Powerhouse Access Road, an access road extends 0.1 mile to the outlet of Tunnel 10 and the South Canal junction with Union Canal.

The third private access road is named the South Powerhouse Access Road. It extends south from the intersection of South Powerhouse Road and Hazen Road approximately 0.9 mile and provides access to the westerly portions of South Canal. The South Powerhouse Access Road is described in more detail below for the South Powerhouse site. The corridor along the canal banks is not fenced. The corridor along the main access road branches is usually fenced and has several gates along its route.

Soap Creek Diversion Dam

Soap Creek Diversion Dam is located on Soap Creek about 5 miles southeast of Manton and 1 mile upstream of the creek's confluence with South Fork Battle Creek. Access to the dam is provided by traveling east from the town of Manton on both paved and unpaved roads, including Forward Road and Ponderosa Way, for about 5 miles to a locked gate near Bluff Springs. One then travels about 1.1 miles south along a narrow, unpaved road to a foot trail, which leads to the right abutment of the dam. Access road improvements necessary to the Five Dam Removal Alternative may be installed at the contractor's discretion.

Soap Creek Diversion Dam is reached as described above for South Canal along the southerly branch of access road from Bluff Springs. The access road ends at a parking/turnaround area about 50 feet above the dam. A 200-foot-long narrow trail and stairs descend to the right abutment of the dam. There is no access trail along the pipeline. There is an access road about 50 feet above and parallel to the pipeline. A rough trail, often wet from springs, leads down from the road to

the stilling well area and Flume 3, which are about 100 feet downstream of the outlet of Tunnel 5. The corridor along the pipeline is not fenced.

Lower Ripley Creek Feeder Diversion Dam

The Lower Ripley Creek Feeder Diversion Dam is located on Ripley Creek about 3.5 miles southwest of Manton and 1 mile upstream of the creek's confluence with South Fork Battle Creek. Access to the dam is provided by traveling Manton Road to the Eagle Canyon Canal crossing and then in an easterly direction for about 2 miles along an unpaved road, passing through several gates to a foot trail leading to the dam. No improvements to the access roads should be necessary.

The Lower Ripley work site can also be reached from the access road to South Powerhouse. From the top of the canyon, an unpaved road on private property can be taken in a westerly direction about 3 miles to the work site. The road is rough and may require minor grading. There is also one small bridge that may limit equipment access.

The Lower Ripley Creek site is reached by driving southwest from the PG&E Manton Service Center about 4.5 miles along Manton Road to the Eagle Canyon Canal crossing. The access road parallels the canal for about 0.6 mile to the Inskip Powerhouse penstock headworks area. A dirt access road then turns easterly and proceeds 1.7 miles to the site. The Lower Ripley work site can also be reached from the South Powerhouse Access Road. From the top of the canyon, an unimproved road on private property can be taken in a westerly direction about 3 miles to the work site. For both routes road conditions vary seasonally but are generally flat, narrow, heavily rutted, and require the use of four-wheel-drive vehicles. The dam is about 50 feet off of the road and can be reached easily by foot and construction equipment. The corridors along the access roads, dam, and feeder canal are not fenced but there are a few gates along the routes. There is a bridge of unknown load-carrying capacity that crosses Union Canal for the road that approaches from the east.

Asbury Pump

The Asbury Pump Diversion Dam site is reached by driving west from the PG&E Manton Service Center along Manton Road for 6.5 miles to Wildcat Road, then proceeding north about 2 miles to the turnoff for the Darrah Springs facility. An unimproved road heads in a westerly direction about 1.4 miles past the hatchery facility to the dam and pump station area, which provides vehicle access to the left side of the facility. Foot access to the right abutment area is possible over the walkway. Vehicle access to the right abutment and pump station area is off of Wildcat Road about 1.3 miles north of the Darrah Springs turnoff. An unimproved road then proceeds 1.7 miles west and south to the pump station.

Traffic Counts

The California Department of Transportation, Office of Traffic Data compiles traffic volume and annual average daily traffic (AADT) count information on

California's state highways. Information on available AADT counts for state highways that could be used to access the Restoration Project area is included in Table 4.9-2. Traffic is typically counted at several intervals along a roadway, and as such, the same car would be counted by every counting instrument. Therefore, the AADT values in Table 4.9-2 are an average of the AADT counts taken for the stretch of roadway that could be impacted by the Restoration Project.

Table 4.9-2. Traffic Counts for State Highways within the Restoration Project Area

Roadway and Location	AADT*	Peak Hourly Counts
Interstate 5 (heading north from the Glenn County line through Tehama County to the Shasta County line)	29,700	3,400
Highway 5 (heading south from the junction of eastbound Route 299 to the Tehama/Shasta County line)	44,375	4,379
Highway 99 (heading south from the junction of Route 36 in Red Bluff to the Butte County line)	8,633	837
Highway 99 (heading north from the Butte/Tehama County line to the junction of Route 36)	8,283	922
Highway 36 (heading northeast from the junction of Interstate 5 in Red Bluff to Milepost 75.2 on Manton Road)	13,283	1,337
Highway 36 (heading southwest Milepost 75.2 on Manton Road to the junction of Interstate 5 in Red Bluff)	9,650	992
Highway 44 (heading southeast from Interstate 5 junction to Shingletown)	18,050	1,804
Highway 44 (heading northwest from Shingletown to the junction of Interstate 5)	19,350	1,924

Source: Caltrans 2003.

*AADT is the total volume of traffic for the year divided by 365 days.

County regional transportation planning agencies compile similar information on some county roadways. Information on available AADT counts for county roadways that could be used to access the Restoration Project area is included in Table 4.9-3. Traffic count information is not readily available for private roadways.

Regulatory Setting

Federal

The Federal Highway Administration addresses the transportation of goods and materials in Title 49 of the Code of Federal Regulations. Federal laws that may be applicable to the project include the Commercial Motor Carrier Safety Assistance Program (49 CFR 350-399) and Appendices A through G of the Federal Motor Carrier Safety Regulations (Federal Motor Carrier Safety

Regulations 2001), which address safety considerations for the transportation of goods, materials, and substances over public highways.

Table 4.9-3. Traffic Counts for County Roadways within the Restoration Project Area

Roadway and Location	AADT*	Peak Hourly Counts
Shasta County		
Battle Creek Bottom Road, 100 feet east of Wildcat Road	35	NA
Battle Creek Bottom Road, 300 feet west of Wilson Hill Road	44	NA
Rock Creek Road, 200 feet east of Wilson Hill Road	311	NA
Rock Creek Road, 200 feet south of Highway 44	42	NA
Rock Creek Road, at Tehama County line	600	NA
Tehama County		
Manton Road, north of Highway 36, northbound lane	263	31
Manton Road, south of Shasta County line, northbound lane	257	41
Manton Road, north of Wildcat Road, northbound lane	290	61
South Powerhouse Road, ½ mile south of Manton Road	160	NA
Forward Road, ¼ mile east of intersection with Manton Road	496	NA
Forward Road, east of Graham Road	224	NA
Forward Road, east of Ponderosa Way	85	NA
Forward Road at the Shasta-Tehama County line	57	NA
* Annual Average Daily Traffic (AADT) is the total volume of traffic for the year divided by 365 days.		
NA = Not available.		
Sources: Cathey pers. comm.; Henley pers. comm.		

State

The California Vehicle Code and Streets and Highways Code contain requirements that may be applicable to the Restoration Project, including the licensing of drivers and vehicles, the transportation of hazardous materials, and rights-of-way.

The applicable requirements of the California Streets and Highways Code contains requirements include:

- Sections 117 and 660-672 require permits for the use of oversized trucks on county roads.

- Sections 660, 670, 1450, 1460 *et seq.*, 1470, and 1480 regulate right-of-way encroachment and the granting of permits for encroachment on state and county roads.

Local

According to Section 655302(b) of the California Government Code, a countywide Circulation Element is required to address the general location and extent of existing and proposed major thoroughfares, transportation routes, terminals, and public transit systems. The Circulation Element is also correlated with the Land Use Element of a county's general plan.

Shasta County

The transportation planning process in Shasta County is a complex program involving millions of dollars; the coordination of local, state, and federal agencies; and the meshing of various planning reports, studies, goals, objectives, and policies. The Circulation Element for Shasta County is just one part of the process (Shasta County 1998). The overall goal of the Shasta County Circulation Element is to develop a balanced, integrated, and diversified transportation system that addresses the regional needs (both urban and rural) of its citizens for a convenient, affordable, safe, and efficient transportation system to move goods and people.

Tehama County

The plans and policies of the Circulation Element of the Tehama County General Plan (Tehama County Community Development Group 1983) are to:

- Serve to coordinate the transportation and circulation system with planned land uses.
- Promote the efficient transport of goods and the safe and effective movement of all segments of the population.
- Make efficient use of existing transportation facilities.
- Provide existing and future residents and the development community with information concerning constraints, requirements, and conditions of the existing and future circulation system.
- Provide environmental quality and promote the wise and equitable use of economics and natural resources.

Environmental Consequences

Summary

No significant transportation impacts are associated with the No Action Alternative. The impacts are associated with all of the Action Alternatives (Five Dam Removal, No Dam Removal, Six Dam Removal, and Three Dam Removal) are less than significant as a result of the specific traffic-related safety standards that would be required as part of the project.

Impact Significance Criteria

The environmental consequences of the Restoration Project on transportation were assessed for two conditions:

- Construction-related impacts—short-term effects resulting from activities undertaken to support Restoration Project construction.
- Operation and maintenance impacts—long-term impacts resulting from operations and maintenance after completion of the Restoration Project.

During construction of the project, the existing roads would be subjected to an increase in traffic volume on and off the Restoration Project sites because of the movement of workers, heavy equipment, construction materials, and solid waste (removed from the project sites). Construction-related impacts on existing traffic conditions were evaluated for the effects that both construction worker commute traffic and the transport and removal of materials and equipment could have on potentially affected roadways. The construction, modification, or removal of facilities at the Restoration Project sites that would occur under the action alternatives would cause increased traffic on roadways used to transport equipment, materials, and construction workers to and from construction areas. Construction personnel would likely travel to the Restoration Project sites from I-5, which is west of the Restoration Project area, and follow SR 36 to Manton Road before proceeding along county and private roads to each site. The proposed access routes to each of the Restoration Project sites are discussed above.

During long-term operation of the project, traffic volumes would be much less than during construction. Traffic would consist primarily of light trucks and occasional construction equipment, such as backhoes or small cranes.

Based on Appendix G and Section 15065 of the State CEQA Guidelines and professional experience in assessing transportation impacts associated with water resource engineering projects, this analysis considers adverse impacts to be significant if the action alternatives could:

- Substantially increase the Average Daily Trip (ADT) volumes so that they could potentially exceed capacities and consequently reduce the level of service along a roadway.
- Cause significant road closures or traffic delays along area roadways. For the purposes of this analysis, a significant delay is defined as a delay of at least 15 minutes.
- Cause delays in emergency vehicle response times or require emergency vehicles to use alternative routes during emergencies.
- Result in unrepaired damage to the existing transportation infrastructure caused by heavy truck traffic or equipment use associated with facility construction, modifications, or removal.

Impacts were identified by comparing the proposed facility changes for the action alternatives to the above-listed impact criteria. The significance of the impact was then assessed. Activities that would not meet the above-listed criteria would be considered to have no impact. Activities that would decrease the likelihood for adverse impacts to occur could be considered to have beneficial impacts.

The traffic analysis is based on the following assumptions:

1. Essentially all workers and materials, and all disposal trips, will originate and end in (or pass through) Red Bluff. The primary access to the Restoration Project would be from Red Bluff along SR 36 to Manton Road.
2. Project-related traffic from Redding by way of SR 44 will be minimal because of the relatively poor conditions of connecting roads.
3. All construction activities will occur simultaneously. This will not necessarily be the case, but making this assumption illustrates the maximum expected project-related traffic on the affected roads.
4. The following roads will serve the project sites:
 - **SR 36 and Manton Road**, to its intersection with the Coleman Diversion Dam access road, will carry the traffic from all portions of the project.
 - **Manton Road**, from its intersection with the Coleman Diversion Dam access road to its intersection with the Eagle Canyon Diversion Dam access road, will serve Eagle Canyon Diversion Dam, Inskip Diversion Dam, South Powerhouse, Soap Creek Feeder, and South Diversion Dam.
 - **Manton Road**, from its intersection with the Eagle Canyon Diversion Dam access road to Manton, will serve Inskip Diversion Dam, South Powerhouse, Soap Creek Feeder, and South Diversion Dam..
 - **Wildcat Road**, from its intersection with Manton Road, carries traffic to the Wildcat Diversion Dam and North Battle Creek Feeder Diversion Dam sites.

- ❑ **Battle Creek Bottom Road**, from its intersection with Wildcat Road to its intersection with the road to Wildcat Diversion Dam, carries traffic to the Wildcat Diversion Dam and North Battle Creek Feeder Diversion Dam.
 - ❑ **Battle Creek Bottom Road**, from its intersection with the road to Wildcat Diversion Dam, carries traffic to the North Battle Creek Feeder Diversion Dam (this includes the Wilson Hill Road as well).
 - ❑ **Manton School Road**, south of Manton, carries the traffic for Inskip Diversion Dam and South Powerhouse.
 - ❑ **Forward Road/Ponderosa Way**, south of Manton, carries the traffic for the Soap Creek Feeder and South Diversion Dam. This analysis assumes that, because of the distance and road conditions, that Manton School Road would provide little or no access to these sites.
5. Trips will be distributed along the roads during work days based on the number of trips generated by each project site served by each road. The total number of trips assigned to each road in Tables 4.9-5, 4.9-7, 4.9-9, and 4.9-11 is the sum of the trips generated by the construction sites served by that road.

Impact Assessment

No Action Alternative

Under the No Action Alternative, it is assumed that there would be no construction, modification, or removal of any facilities at the Hydroelectric Project sites. The No Action Alternative would also not result in the construction of any new access roads or improvements to any existing access roads, other than those already planned as a part of the existing operation and maintenance plan for the Hydroelectric Project. The No Action Alternative is not expected to impact transportation routes in the Restoration Project area and, therefore, would also not impact transportation resources.

Five Dam Removal Alternative (Proposed Action)

Table 4.9-4 provides a list of the assumptions used to determine the construction-related impacts associated with the Five Dam Removal Alternative. As shown in Table 4.9-4, the estimated number of daily round trips for the sites affected by this alternative ranges from six at the Coleman and Lower Ripley Diversion Dam sites, to 18 at the Inskip Powerhouse site, and 22 at the South Powerhouse and Inskip Diversion Dam work site. Table 4.9-5 illustrates the estimated amount of new traffic that would be generated by construction activities, by average daily round trips. For comparison to the AADT numbers listed in Tables 4.9-2 and 4.9-3, the average number of daily round trips in Tables 4.9-4 and 4.9-5 should be multiplied by 2 (i.e., 12 daily round trips would be 24 ADT).

Once construction is completed, the new fish facilities will require frequent monitoring and attendance to ensure the requirement for “fail-safe” operation is met. This will involve more trips to the sites than currently occur. This increase over existing levels is expected to be minor and would not result in an adverse impact.

Table 4.9-4. Summary of Construction Impact Assumptions Associated with the Five Dam Removal Alternative

Restoration Project Sites	Construction Duration (months)	Average Daily Number of Construction Workers ¹	Total Number of Truck Round Trips ²	Estimated Average Number of Daily Round Trips
Wildcat Diversion Dam (dam, pipe and canal removal)	4	10	200	12
Eagle Canyon Diversion Dam (fish screen and ladder)	8	10	248	11
North Battle Creek Feeder Diversion Dam (fish screen and ladder)	8	10	200	11
Inskip Powerhouse (penstock bypass and tailrace connector)	9	15	600	18
Coleman Diversion Dam (removal)	2	5	40	6
South Powerhouse and Inskip Diversion Dam (tunnel tailrace connector, fish screen and ladder)	19	20	1000	22
South Diversion Dam (dam and canal removal)	5	10	485	14
Lower Ripley Creek Diversion Dam (dam and canal removal)	1	5	19	6
Soap Creek Diversion Dam (dam and pipe removal)	1	5	97	9

¹ Assumes all workers would drive to the site parking areas in their own vehicles.

² Truck trips are total round trips to deliver construction materials and equipment, such as concrete, rebar, riprap, gravel, mechanical and electrical materials, earthmoving equipment, etc. and truck trips for transporting materials to be disposed or salvaged, over the entire construction period (not daily).

Table 4.9-5. Summary of Traffic Impact Assumptions Associated with the Five Dam Removal Alternative

Road Segment	Average Daily Round Trips
Hwy. 36/Manton Rd.—Red Bluff to Wildcat Rd.	109
Manton Rd.—from Wildcat Rd. to Eagle Canyon Diversion Dam access road	56
Manton Rd.—Eagle Canyon Diversion Dam access road to town of Manton	45
Wildcat Rd.—Manton Rd. to Battle Creek Bottom Rd.	23
Battle Creek Bottom Rd.—Wildcat Rd. to Wildcat Diversion Dam turnoff	11
Wilson Hill Rd.	11
Manton School Rd.	22
Forward Rd./Ponderosa Way	23

Impact 4.9-1 Less than Significant—Construction and removal activities at the Restoration Project sites would result in increased traffic volumes on state, county, and private roadways.

Activities proposed under the Five Dam Removal Alternative would result in increased traffic levels on state, county, and private roads used to transport construction workers, equipment, and materials to and from the Restoration Project sites. Construction workers and equipment would likely travel along a series of state, county, and private roads to access the individual Restoration Project sites. The specific roads used to access the sites are described above. As shown in Table 4.9-4, the estimated number of daily round trips for the sites affected by this alternative ranges from six at the Coleman and Lower Ripley Diversion Dam sites, to 18 at the Inskip Powerhouse site, and 22 at the South Powerhouse and Inskip Diversion Dam work site.

Even if all activities were to occur simultaneously, it is not expected that increased traffic on state highways would result in significant impacts to traffic volumes. The increases in construction-related traffic counts (i.e., a worst-case maximum of 109 round trips daily during the construction period) would be very low when compared to the existing and average ADT counts shown in Table 4.9-2. Because of the relatively minor number of construction-related trips added to state roads, and temporary nature of construction traffic, the Five Dam Removal Alternative is not expected to result in significant increases in traffic volumes. The impact to increased traffic volumes on state highways is considered less than significant.

Traffic would also increase on those county and private roadways used to access the individual Restoration Project sites. Average ADT counts are not available for all of the county roads that provide access to the sites. Roads that may be used to access the Restoration Project sites and that have available traffic count data are provided in Table 4.9-3. It is also assumed that access roads with no traffic count information available have traffic volumes too low to warrant counting. This conclusion is further supported by the fact the Restoration Project

sites are located in very remote areas and are not in proximity to more than a few residential areas.

Many of the private access roads have locked gates and do not provide access to areas that would be subject to large numbers of visiting public. Further, the purpose of many of these roads is specifically to provide access to the Restoration Project sites. Because of the small existing traffic volumes on the private roads, the Five Dam Removal Alternative is expected to result in less-than-significant increases in traffic volumes. Increased traffic is not expected to result in traffic delays longer than 15 minutes because Reclamation contractors would be required to keep delays below 15 minutes' duration or provide a suitable detour.

The impact of increased traffic volumes on county and private roads would be less than significant as a result of improvements being installed as part of the project and compliance with *Reclamation Safety and Health Standards*. Specifically, the following intersection improvements would improve traffic flow and safety during construction:

- Improvement of the intersection of Manton Road and the private road accessing the Eagle Canyon Diversion Dam.
- Improvement of the intersection of Manton Road and the private road accessing the Inskip powerhouse bypass facility (called the "plateau road" above).
- Improvement of the intersection of Battle Creek Bottom Road and the private road accessing the Wildcat Diversion Dam and Canal.

The *Reclamation Safety and Health Standards* consist of specific requirements for contractors working on Reclamation jobs. Topics covered include hazard assessment, medical services and first aid, emergency plans, occupational health, personal protective equipment, signs, fire prevention and protection, standards for materials handling, and use of tools and equipment. As part of the *Standards*, these requirements are made a part of the contracts entered into by Reclamation and its contractors. Reclamation undertakes regular inspections during construction projects to ensure contractor compliance with the *Standards*.

The following sections of the *Standards* exemplify the requirements that will reduce potential traffic impacts below a level of significance:

- Section 3.3 requires the contractor to submit a comprehensive written safety program to Reclamation for its review and approval that covers "all aspects of onsite and applicable offsite operations and activities associated with the contract." This includes signs and road flagging procedures.
- Section 9.1.10 provides requirements for traffic signs and barricades, including design and use of signs, visibility, and traffic controls.
- Section 9.4 establishes standards for flag persons directing traffic.

- Section 20.14 requires all roads to be designed to safely accommodate the movement of vehicles or equipment at appropriate speeds. This includes sight lines around curves, posted speed limits based on vehicles' stopping abilities, traffic control devices, and road maintenance. Single-lane haul roads with two-way traffic must be provided with adequate turnouts or a traffic control system to prevent accidents. Roads must be maintained in a safe condition and dust must be controlled.

The contract specifications imposed by Reclamation for work on this project include traffic control measures intended to reduce the impact of construction traffic. These specifications will be enforced by Reclamation as part of the contracts. These specifications include:

- submitting a traffic control plan for Reclamation's approval;
- limiting speeds to a maximum of 15 miles per hour, except near residences where a lower speed may be required;
- informing affected residents along the routes about changes in traffic levels and providing reasonable accommodations to ensure traffic safety, such as fencing or lower speed limits;
- providing a hot line for public input regarding traffic concerns through the community of Manton;
- providing necessary traffic control devices and flag persons to prevent accidents and damage or injury to passing traffic;
- delaying work along public and private roads until proper traffic control devices are in place;
- providing unobstructed, smooth, and dustless passageway for one lane of traffic through construction operations; and
- maintaining traffic flow to minimize obstruction and inconvenience to public traffic.

Impact 4.9-2 Less than Significant—Construction traffic could damage county and private roadways.

Reclamation contractors will be required not to exceed legal load limits for the county roads accessing the sites. Other measures, including improvements to three intersections, will help avoid damage from occurring. Some private access roads to the Restoration Project sites would require initial improvements before construction activities begin. These activities would include regrading and gravelling of existing roadways and on-going maintenance during construction. Post-construction repairs would be coordinated with landowners to ensure that the roads would be left in a condition equal to or better than the existing, preconstruction condition. The impact of construction traffic on county and private roads is considered to be less than significant.

Impact 4.9-3 Less than Significant—Construction traffic or activities could delay emergency vehicle response times.

It may be necessary for emergency response vehicles to access construction sites or residences along private roads accessing the project area. It is not, however, expected that construction traffic would substantially delay emergency vehicle response times. Emergency vehicles would likely be needed to respond to an incident at a site when workers are on site and not during morning and afternoon commute times, when traffic is heaviest.

It is assumed that emergency vehicles would follow the construction routes identified earlier in this section. Access routes used by construction and truck traffic should also be suitable for emergency response vehicles. In some cases, roadway improvements would be completed prior to construction activities. In cases where the sites are inaccessible by vehicles, such as Wildcat Diversion Dam and Eagle Canyon Diversion Dam, the sites would be accessed by foot. In this case, sites may also be accessed by helicopters transporting paramedics, or by foot, whichever is faster. The impact of construction traffic and activities on emergency vehicle response times is considered to be less than significant.

In addition, the *Reclamation Safety and Health Standards* require preparation and contractor's adherence to an emergency plan for each job. *Standards* Section 6.2 mandates that the emergency plan include requirements for emergency equipment, rescue, and medical duties. These requirements are carried over into the contract specifications that will be imposed by Reclamation on its contractors.

No Dam Removal Alternative

Table 4.9-6 provides a list of the assumptions used to determine the impacts associated with the No Dam Removal Alternative. It also provides the estimated total number of truck trips for each of the potentially affected construction sites. Table 4.9-7 illustrates the estimated average daily round trip traffic on selected roads. For comparison to the AADT numbers listed in Tables 4.9-2 and 4.9-3, the average number of daily round trips in Tables 4.9-6 and 4.9-7 should be multiplied by 2 (i.e., 11 daily round trips would be 22 ADT).

Table 4.9-6. Summary of Construction Impact Assumptions Associated with the No Dam Removal Alternative

Restoration Project Sites	Construction Duration (months)	Average Daily Number of Construction Workers ¹	Total Number of Truck Round Trips ²	Estimated Average Number of Daily Round Trips
Wildcat Diversion Dam (fish screen and ladder)	8	10	100	11
Eagle Canyon Diversion Dam (fish screen and ladder)	8	10	248	11
North Battle Creek Feeder Diversion Dam (fish screen and ladder)	8	10	200	11
Inskip Powerhouse (no bypass or connector)	-	-	-	-
Coleman Diversion Dam (fish screen and ladder)	9	13	150	14
South Powerhouse and Inskip Diversion Dam (fish screen and ladder, no bypass/connector)	17	17	950	20
South Diversion Dam (fish screen and ladder)	8	10	450	13
Lower Ripley Creek Diversion Dam (No action)	-	-	-	-
Soap Creek Diversion Dam (No action)	-	-	-	-

¹ Assumes all workers would drive to the site parking areas in their own vehicles.

² Truck trips are total round trips to deliver construction materials and equipment, such as concrete, rebar, riprap, gravel, mechanical and electrical materials, earthmoving equipment, etc. and truck trips for transporting materials to be disposed or salvaged over the entire construction period (not daily).

Table 4.9-7. Summary of Traffic Impact Assumptions Associated with the No Dam Removal Alternative

Road Segment	Average Daily Round Trips
SR 36/Manton Rd.—Red Bluff to Wildcat Rd.	80
Manton Rd.—from Wildcat Rd. to Eagle Canyon Diversion Dam access road	44
Manton Rd.—Eagle Canyon Diversion Dam access road to town of Manton	33
Wildcat Rd.—Manton Rd. to Battle Creek Bottom Rd.	22
Battle Creek Bottom Rd.—Wildcat Rd. to Wildcat Diversion Dam turnoff	11
Wilson Hill Rd.	11
Manton School Rd.	20
Forward Rd./Ponderosa Way	13

There would be some variation between the specific roads affected under the No Dam Removal Alternative and those affected under the Five Dam Removal Alternative because the No Dam Removal Alternative would not result in any activities at the Soap Creek Feeder and Lower Ripley Creek Feeder Diversion Dams. In addition, this alternative would require fewer workers (70 workers vs. 90 workers) and less solid waste removal, thereby generating less overall traffic than the Five Dam Removal Alternative. The one exception is the Coleman Diversion Dam, where installation of the fish screen and ladder would involve more workers (and truck trips) over a longer period in comparison to the Five Dam Removal Alternative. The estimated daily round trips would be 14, rather than the six estimated under the Five Dam Removal Alternative.

Impact 4.9-4 Less –than Significant—Construction and removal activities at the Restoration Project sites would result in increased traffic volumes on state, county, and private roadways.

This alternative would result in a smaller traffic increase than the Five Dam Removal Alternative and would avoid increases in traffic on the private roads accessing the Soap Creek Feeder and Lower Ripley Creek Feeder Diversion Dams. Therefore, the impacts of this alternative would be less than the Five Dam Removal Alternative.

The very low volumes of traffic extant on the other private access roads serving the sites would be subject to a substantial increase as a result of this alternative. However, the impact of increased traffic volumes on county and private roads would be less than significant as a result of improvements being installed as part of the project, compliance with *Reclamation Safety and Health Standards*, and the Reclamation contract specifications, as described above.

Impact 4.9-5 Less than Significant—Construction traffic could damage county and private roadways.

This alternative would result in less traffic than the Five Dam Removal Alternative because it would employ fewer workers, require fewer truck trips to remove solid waste, and affect fewer facilities (and private roads accessing those facilities). At the same time, it would contain the same Reclamation requirements for improvements and postconstruction repair of roadways as described for the Five Dam Removal Alternative. Therefore, the impacts of this alternative on the physical condition of area roads would be similar to, but less than, that of the Five Dam Removal Alternative. The impact of construction traffic on county and private roads is considered less than significant.

Impact 4.9-6 Less than Significant—Construction traffic or activities could delay emergency vehicle response times.

This alternative would result in a smaller traffic increase than the Five Dam Removal Alternative. This alternative would contain the same Reclamation requirements for avoiding traffic delays as described for the Five Dam Removal Alternative. In addition, it would avoid work at two remote sites. Therefore, the impact of this alternative would be expected to be less extensive than, but otherwise similar to, that of the Five Dam Removal Alternative. The requirements of the *Reclamation Safety and Health Standards* and contract

specifications described above would apply to this alternative as well. This impact is considered less than significant.

Six Dam Removal Alternative

The major difference between the Six Dam Removal Alternative and the Five Dam Removal Alternative is the removal of Eagle Canyon Diversion Dam and appurtenant facilities. Table 4.9-8 provides a list of the assumptions used to determine the traffic impacts associated with the Six Dam Removal Alternative.

Table 4.9-8. Summary of Construction Impact Assumptions Associated with the Six Dam Removal Alternative

Restoration Project Sites	Construction Duration (months)	Average Daily Number of Construction Workers ¹	Total Number of Truck Round Trips ²	Estimated Average Number of Daily Round Trips
Wildcat Diversion Dam (dam, pipe and canal removal)	4	10	200	12
Eagle Canyon Diversion Dam (dam and flume removal, plug canal)	4	10	247	13
North Battle Creek Feeder Diversion Dam (fish screen and ladder)	8	10	200	11
Inskip Powerhouse (penstock bypass and tailrace connector)	9	15	590	18
Coleman Diversion Dam (removal)	2	5	40	6
South Powerhouse and Inskip Diversion Dam (tunnel tailrace connector, fish screen and ladder)	19	20	1,000	22
South Diversion Dam (dam and canal removal)	5	10	485	14
Lower Ripley Creek Diversion Dam (dam and canal removal)	1	5	19	6
Soap Creek Diversion Dam (dam and pipe removal)	1	5	97	9

¹ Assumes all workers would drive to the site parking areas in their own vehicles.

² Truck trips are total round trips to deliver construction materials and equipment, such as concrete, rebar, riprap, gravel, mechanical and electrical materials, earthmoving equipment, etc. and truck trips for transporting materials to be disposed or salvaged over the construction period (not daily).

Table 4.9-9. Summary of Traffic Impact Assumptions Associated with the Six Dam Removal Alternative

Road Segment	Average Daily Round Trips
SR 36/Manton Rd.—Red Bluff to Wildcat Rd.	111
Manton Rd.—from Wildcat Rd. to Eagle Canyon Diversion Dam access road	58
Manton Rd.—Eagle Canyon Diversion Dam access road to town of Manton	45
Wildcat Rd.—Manton Rd. to Battle Creek Bottom Rd.	23
Battle Creek Bottom Rd.—Wildcat Rd. to Wildcat Diversion Dam turnoff	11
Wilson Hill Rd.	11
Manton School Rd.	22
Forward Rd./Ponderosa Way	23

As shown in Table 4.9-8, the estimated number of daily round trips for the sites affected by this alternative ranges from six at the Coleman and Lower Ripley Diversion Dam sites, to 18 at the Inskip Powerhouse site, and 22 at the South Powerhouse and Inskip Diversion Dam work site. Table 4.9-9 illustrates the estimated average daily round trip traffic on selected roads. For comparison to the AADT numbers listed in Tables 4.9-2 and 4.9-3, the average number of daily round trips in Tables 4.9-8 and 4.9-9 should be multiplied by 2 (i.e., 12 daily round trips would be 24 ADT).

Impact 4.9-7 Less than Significant—Construction and removal activities at the Restoration Project sites would result in increased traffic volumes on state, county, and private roadways.

The Six Dam Removal Alternative would employ the same number of workers, require approximately the same amount of solid waste to be removed, and would involve activities at all of the same facilities as the Five Dam Removal Alternative. Accordingly, with the exception of the Eagle Canyon Diversion Dam, where the estimated number of daily round trips would be 13, rather than the 11 estimated for the Five Dam Removal Alternative, anticipated traffic would be the same as for the Five Dam Removal Alternative. The very low volumes of traffic extant on the other private access roads serving the sites would be subject to a substantial increase as a result of this alternative. However, the impact of increased traffic volumes on county and private roads would be less than significant as a result of improvements being installed as part of the project, compliance with the Bureau's *Reclamation Safety and Health Standards*, and contract specifications, as described above. Therefore, this alternative's level of impact would be the same as that of the Five Dam Removal Alternative. This impact is considered less than significant.

Impact 4.9-8 Less than Significant—Construction traffic could damage county and private roadways.

This alternative would employ the same number of workers and require approximately the same amount of solid waste to be removed as the Five Dam Removal Alternative. It would also involve activities at all of the same facilities as the Five Dam Removal Alternative. The operational measures intended to avoid significant effects on roads accessing the project sites would be the same as well. Therefore, the Six Dam Removal Alternative's level of impact would be the same (i.e., less than significant) as that of the Five Dam Removal Alternative.

Impact 4.9-9 Less than Significant—Construction traffic or activities could delay emergency vehicle response times.

The Six Dam Removal Alternative would employ the same operational measures intended to avoid significant effects on roads accessing the project sites as the Five Dam Removal Alternative. Therefore, this alternative's level of impact would be the same (i.e., less than significant) as that of the Five Dam Removal Alternative.

Three Dam Removal Alternative

Table 4.9-10 provides a list of the assumptions used to determine the impacts associated with the Three Dam Removal Alternative. As shown in Table 4.9-10, the estimated number of daily round trips for the sites affected by this alternative ranges from six at the Coleman Diversion Dam site to 23 at the South Powerhouse and Inskip Diversion Dam work site. Table 4.9-11 illustrates the estimated average daily round trips for selected roads. For comparison to the AADT numbers listed in Tables 4.9-2 and 4.9-3, the average number of daily round trips in Tables 4.9-10 and 4.9-11 should be multiplied by 2 (i.e., 12 daily round trips would be 24 ADT).

This alternative would employ fewer workers (77 workers vs. 90 workers) and would require the removal of a slightly smaller volume of solid waste (2,900 cubic yards vs. 3,000 cubic yards) than the Five Dam Removal Alternative. The Three Dam Removal Alternative would not include improvements to the Soap Creek Feeder and Lower Ripley Creek Feeder Diversion Dams, both of which are slated for removal under the Five Dam Removal Alternative. The Three Dam Removal Alternative would remove the Eagle Canyon Diversion Dam, slated for installation of a new fish screen and ladder under the Five Dam Removal Alternative (resulting in an increase in estimated trips from 11 under the Five Dam Removal Alternative to 13 under this alternative), and install a new fish screen and ladder at the South Diversion Dam rather than removing that dam as under the Five Dam Removal Alternative. The estimated daily round trips to and from the Inskip Powerhouse site would be 14, rather than the 18 estimated for the Five Dam Removal Alternative. Otherwise, traffic volumes are estimated to be nearly the same as for the Five Dam Removal Alternative. The Three Dam Removal Alternative would affect six of the eight facilities slated for improvement under the Five Dam Removal Alternative.

Table 4.9-10. Summary of Construction Impact Assumptions Associated with the Three Dam Removal Alternative

Restoration Project Sites	Construction Duration (months)	Average Daily Number of Construction Workers ¹	Total Number of Truck Round Trips ²	Estimated Average Number of Daily Round Trips
Wildcat Diversion Dam (dam, pipe and canal removal)	4	10	200	12
Eagle Canyon Diversion Dam (dam and flume removal, plug canal)	4	10	247	13
North Battle Creek Feeder Diversion Dam (fish screen and ladder)	8	10	200	11
Inskip Powerhouse (no penstock bypass, smaller tailrace connector)	8	12	292	14
Coleman Diversion Dam (removal)	2	5	40	6
South Powerhouse and Inskip Diversion Dam (tailrace flow separator, fish screen and ladder)	19	20	1100	23
South Diversion Dam (fish screen and ladder)	8	10	450	13
Lower Ripley Creek Diversion Dam (No action)	-	-	-	-
Soap Creek Diversion Dam (No action)	-	-	-	-

¹ Assumes all workers would drive to the site parking areas in their own vehicles.

² Truck trips are round trips to deliver construction materials and equipment, such as concrete, rebar, riprap, gravel, mechanical and electrical materials, earthmoving equipment, etc. and truck trips for transporting materials to be disposed or salvaged.

Table 4.9-11. Summary of Traffic Impact Assumptions Associated with the Three Dam Removal Alternative

Road Segment	Average Daily Round Trips
SR 36/Manton Rd.—Red Bluff to Wildcat Rd.	92
Manton Rd.—from Wildcat Rd. to Eagle Canyon Diversion Dam access road	49
Manton Rd.—Eagle Canyon Diversion Dam access road to town of Manton	36
Wildcat Rd.—Manton Rd. to Battle Creek Bottom Rd.	23
Battle Creek Bottom Rd.—Wildcat Rd. to Wildcat Diversion Dam turnoff	11
Wilson Hill Rd.	11
Manton School Rd.	23
Forward Rd./Ponderosa Way	13

Impact 4.9-10 Less than Significant—Construction and removal activities at the Restoration Project sites would result in increased traffic volumes on state, county, and private roadways.

This alternative would result in a smaller traffic increase than the Five Dam Removal Alternative because it would employ fewer workers and would not result in traffic increases on the unpaved private roads accessing the Soap Creek Feeder and Lower Ripley Creek Feeder Diversion Dams. Nonetheless, the very low volumes of traffic extant on the other private access roads serving the sites would be subject to a substantial increase as a result of this alternative.

Therefore, the impacts of this alternative would be less than those of the Five Dam Removal Alternative. The impact of increased traffic volumes on county and private roads would be less than significant as a result of improvements being installed as part of the project, compliance with *Reclamation Safety and Health Standards*, and contract specifications, as described above.

Impact 4.9-11 Less than Significant—Construction traffic could damage county and private roadways.

This alternative would generate less traffic than the Five Dam Removal Alternative because it would employ fewer workers and would require the removal of a slightly smaller volume of solid waste. It would also avoid changes to traffic levels on the unpaved private roads accessing Soap Creek Feeder and Lower Ripley Creek Feeder Diversion Dams. At the same time, it would contain the same Reclamation requirements for improvements and postconstruction repair of roadways as described for the Five Dam Removal Alternative.

Therefore, the impacts of this alternative on the physical condition of area roads would be expected to be less than those of the Five Dam Removal Alternative, but otherwise similar. This impact is considered less than significant.

Impact 4.9-12 Less than Significant—Construction traffic or activities could delay emergency vehicle response times.

The Three Dam Removal Alternative would result in a smaller traffic increase than the Five Dam Removal Alternative. This alternative would contain the

same Reclamation requirements for avoiding traffic delays and providing emergency plans as described for the Five Dam Removal Alternative. In addition, it would avoid work at two remote sites. Therefore, the impact of this alternative would be expected to be less extensive than, but otherwise similar to, that of the Five Dam Removal Alternative. This impact is considered less than significant.

Cumulative Impacts

Cumulative impacts are the combined impacts of past, present, and reasonably foreseeable future projects (including those mentioned in Chapter 6) on traffic. The area roads are not currently subject to significant levels of traffic. There are no other known future projects that would contribute substantial amounts of traffic to the road system serving the Restoration Project. Implementation of any of the action alternatives is not expected to result in any cumulative impacts to roadways in or around the Restoration Project area. Roadways would be more heavily used during construction activities; however, this would occur only for the duration of such activities. Access during long-term operation and maintenance of the Restoration Project would not result in a substantial increase in vehicular traffic over current, pre-action levels. The Restoration Project is not anticipated to result in substantial increases in public access to the area because many of the sites are remotely located (away from large numbers of sensitive receptors) and are accessed by private roads closed to the general public. Therefore, no significant increase in recreation-related traffic would occur under any of the alternatives.

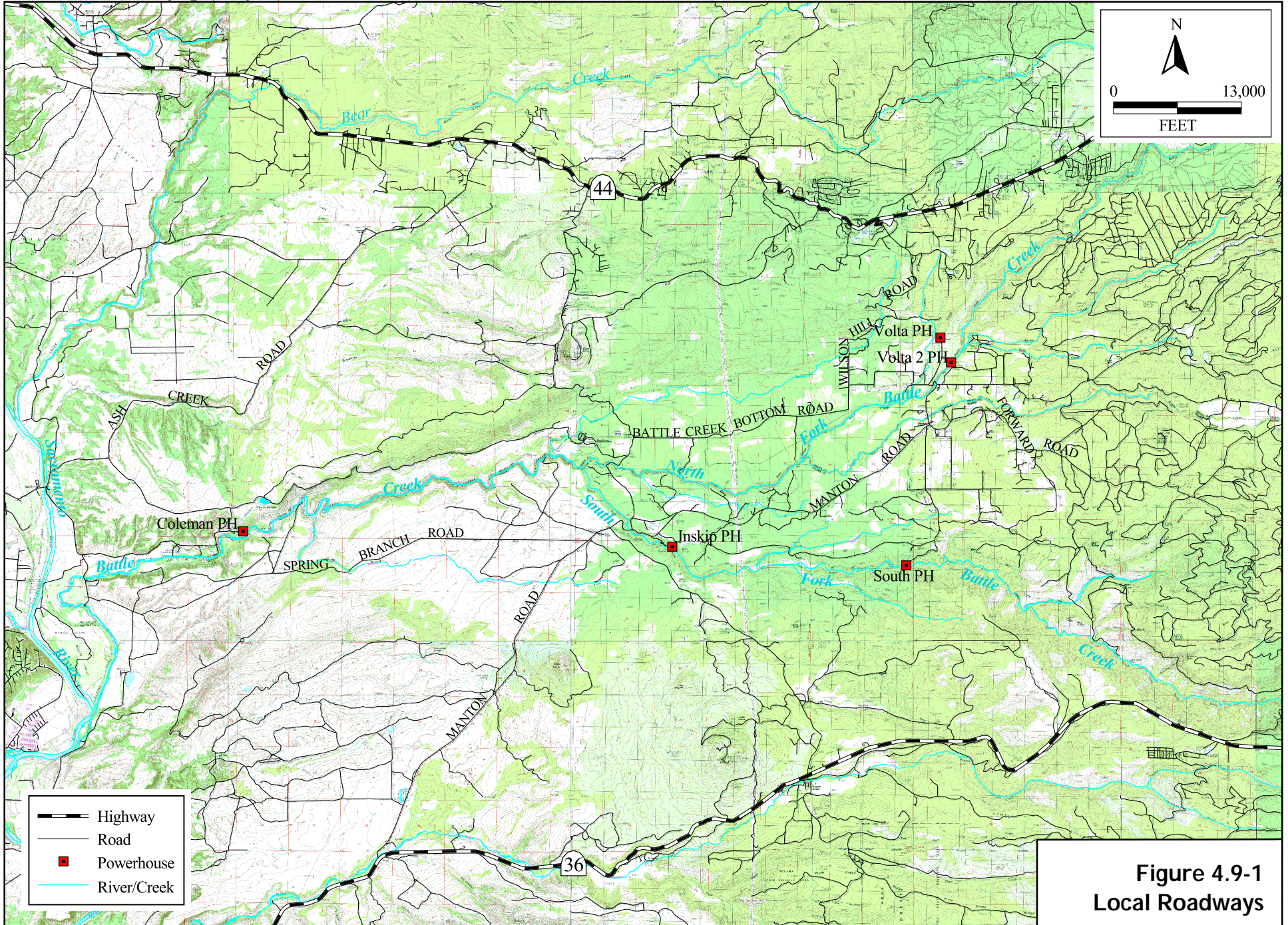
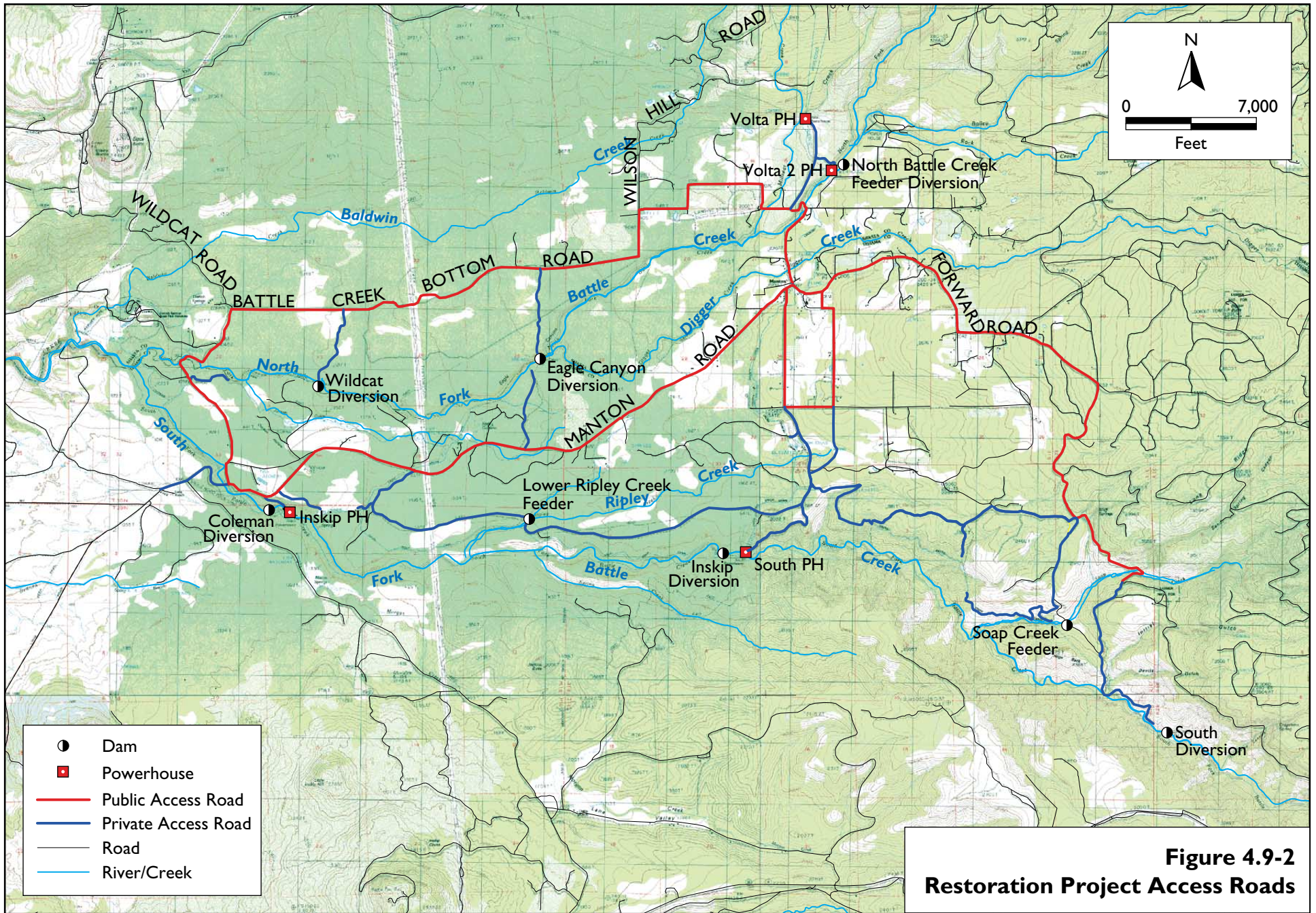


Figure 4.9-1
Local Roadways



**Figure 4.9-2
Restoration Project Access Roads**

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