Gold Mountain Road Repair Environmental Assessment

Introduction

This Environmental Assessment analyzes the environmental effects of replacing the White Chuck Bridge and repairing roads on the south side of Gold Mountain (also known as Gold Hill[1]); both the bridge and the road system were damaged during a severe flood event in October 2003. The proposed project is located in the Sauk River drainage on the Darrington Ranger District, Mt. Baker-Snoqualmie National Forest (MBS or the Forest) in Washington State. Emergency Relief for Federally Owned (ERFO) funding from the Federal Highway Administration have been provided for the in-kind repair of the Gold Mountain roads and White Chuck Bridge.

Record rainfall in October 2003 produced some of the most severe storm damage seen on Mt. Baker-Snoqualmie National Forest System lands in many years. During a 24-hour period, more than six inches of rain fell in the Forest lowlands and up to ten inches in the higher elevation areas. This event was unprecedented in the historical record of flows on the Sauk River. Water flow gauges, in place for over 70 years, measured an overwhelming increase in flows with the Sauk River Gauge going from 4,000 cubic feet per second (cfs) flow to over 100,000 cfs.

The Suiattle River and White Chuck Rivers, the two major river systems with headwaters on Glacier Peak, carried incredible high volumes of runoff. This runoff is suspected to have originated in glacial dam bursts that scoured the river channels from the headwaters to the Sauk River. The avulsion[2] of the rivers not only changed river courses but also contributed to the movement of very large volumes of sediment to the lower river systems, as seen in perched sediment depositions of three to four feet of new and reworked material on gravel bars and in the floodplain. This perched sediment continues to be transported during high water events from rain or storms. The avulsion also contributed to a major influx of large wood from trees that were undercut, uprooted, and transported in the high flows.

Movement of the large wood and the massive erosion of the riverbanks left many riverside roads—including roads along the south side of Gold Mountain—trail, and recreation sites severely impacted. The event was localized primarily to the North Cascade Mountains, in east Snohomish, Skagit, and Whatcom Counties, and east-side counties, on the Darrington and Mt. Baker Ranger Districts.

In the past, many heavy rainstorms were compounded by an existing snowpack that contributed to the intensity and locations of flood damage (referred to as a rain-on-snow event). In October 2003, the snowpack was at an unusually high elevation, 5,500 feet and above. The 2003 flood event did not cause the typical rain-on-snow type damage, impacting higher elevation roads and trails. Instead, the damage was mostly to areas along the river systems that concentrated flows from Glacier Peak and the higher elevation peaks of the North Cascade Mountains. Major damage was to main arterial roads, bridges, and trails and not just isolated road systems. Following the 2003 floods, the Suiattle River has no trail bridges or vehicle bridges left; the White Chuck River has no trail bridges left and only one of two vehicle bridges survived.

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1 Gold Mountain is also known locally as Gold Hill and was referred to as "Gold Hill" during initial scoping and news releases, as well as on the MBS website.

2 Shift in the course of the stream.

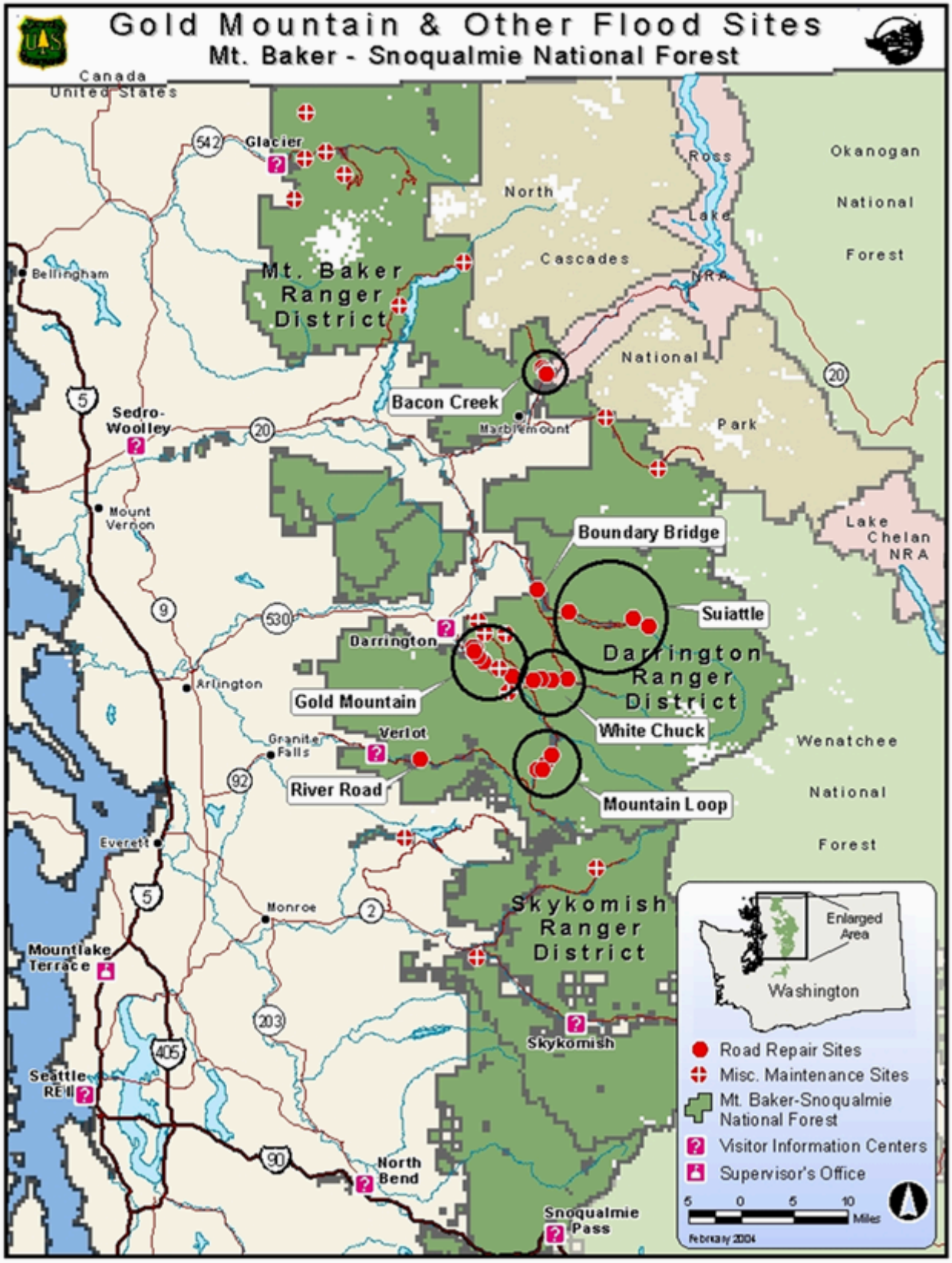
The initial assessment of repairs to be made and the estimated funding required to repair flood damage was determined and documented through the Federal Highways Administration's Damaged Survey Reports (DSRs, see project file). Emergency Relief for Federally Owned (ERFO) roads targets funding for reconstruction of roads that have suffered damage because of a natural disaster over a wide area or from a catastrophic failure.

A Mt. Baker-Snoqualmie National Forest team reviewed location and extent of the flood damage to National Forest System (NFS) roads and discussed various means of analysis of the damage and response options. The team, with concurrence from the District Rangers and Forest Supervisor determined that analysis of the flood damage sites grouped by geographical area and connecting roads would best address issues and resource concerns, and allow the agency to respond to the flood event in a logical and timely fashion. See Figure 1, map of flood damaged road sites. Questions asked by the team included:

- Would repairing (or not) a road system influence repairing or using another road system?
- Can the effects of other projects best be met in a single large assessment or in the cumulative effects assessments of various projects?

The Forest Service team analyzed the various proposals and determined that the scattered road damage repairs constituted similar, but not necessarily connected actions. Therefore, for the purposes of site-specific analyses, as required by National Environmental Policy Act (NEPA), the damaged sites were grouped by road system into logical geographic areas, to address the site-specific problems or need for action. The rationale for analyzing the road damage separately in environmental assessments (EA), rather than in a single analysis is because the actions are similar in scope but are **not** considered to be connected actions: to repair (or not) any one road system would be independent of use of the other road systems being analyzed. Impacts of the repair /no repair options were not viewed as having significant cumulative impacts. Further discussion can be found in Project Scope (below) and in the project files.

Figure 1: Forest-wide Flood Damage Locator Map



Need for Action

There is a need to re-establish year-round access on flood-damaged roads in the Road 22 System, to provide safe and efficient use of recreational facilities and to administer National Forest System lands that are part of the matrix (where most timber management is to be conducted). The purpose of the proposed action is to meet the goals and objectives outlined in the Forest Plan, as amended, which include managing the transportation system at the minimum standard needed to support planned uses and activities, and provide for public safety (USDA FS 1990, p. 4-7). In order to re-establish access, there is a need to remove and replace the White Chuck Bridge, and repair flood damaged sites along approximately six miles of Road 22 along with Road 2210 and 2211. Impacted sites include washouts at Sites #1-6 (MP 10.1, 9.4, 5.7, 5.6, 5.0 and 4.3) on Road 22, and Sites #7 and #8 on Road 2210 at MP 0.0 to 0.4, and 1.4, as well as Site #9 (MP 0.1) on Road 2211 (see Figure 4).

There is a need to restore year-round access on Road 22 to standards consistent with the goals and objectives of the Mt. Baker-Snoqualmie National Forest Land and Resource Management Plan (as amended). The 1994 Access and Travel Management Plan identified Road 22 as a ML3 access need. The more recent Roads Analysis (July 2003) confirms a high level of access need for recreation. Repairs need to be consistent with current road management objective for providing Maintenance Level (ML) 3 to the White Chuck Boat Launch and White Chuck Bench Trailhead (see Figure 5 for location) as per the Forest-wide Roads Analysis (July 2003)[3]. There is a high need for most of these roads for recreation use and beyond the boat launch and trailhead there is a high need for access to matrix lands for timber management (Roads Analysis July 2003). Road 22 beyond the White Chuck Bench Trailhead would remain at a ML3, but, based on current budget projections, funding for road maintenance will be reduced. Maintenance for Road 22 and 24 beyond the White Chuck Bench Trailhead will have less brushing and blading, resulting in a rougher, narrower road corridor. Additionally, there is a need to complete the repair within the timeframe, funding, and stipulations of the ERFO program.

The White Chuck Bridge and Road 22 are part of a highly used, year-around administrative and recreation route on the Mt. Baker Snoqualmie National Forest. Visitors use this route for access to the developed White Chuck Boat Launch, which is used by four commercial outfitter guides (USDA FS 1996) for rafting adventures on the middle-run of the Sauk River. Public boaters, rafters, and kayakers use the launch also. A large parking area is part of the launch complex providing parking for 12 vehicles and 2 buses. The parking lot is also used to access dispersed recreational sites along the road for activities like picnicking, camping, and fishing.

The ***White Chuck Bench Trail #731*** is usually accessed from Road 22-013, a local (spur) road from Road 22. This low-elevation trail provides an easily accessible hike and fishing access that is available almost year-round.

Road 22 provides needed year-around administrative access to a large portion of Gold Mountain area that is allocated to the matrix. Most timber harvest and silvicultural activities are to take place on matrix lands (USDA FS, USDI BLM 1994, p. 7). Gold Mountain is one of the largest blocks of matrix on the Mt. Baker-Snoqualmie; access to it is important to timber management and meeting the goals of the Forest Plan, as amended (USDA 1990, USDA FS, USDI BLM 1994, p. 3). Only about ten percent of the net Forest acres are allocated to the matrix. The acres located on Gold Mountain and Prairie Mountain represent one-third of the Forest's matrix. Due to timing

[3] Maintenance Level 3 roads are open and maintained for travel by a prudent driver in a standard passenger car. Roads are typically low speed, single lane with turnouts and spot surfacing (Roads Analysis, White Paper, page 8, 1996).

restrictions to protect federally listed threatened and endangered fish and wildlife species, logging and other management activities must often be scheduled only in the fall and winter months. Road 22 provides efficient year-round access to the southwest side of this matrix area plus access for wildland fire response and emergencies. Reopening Road 22 to motorized use would restore commercial and recreational opportunities that contribute toward the local communities' economy.

Road 22 also provides access for driving pleasure, hiking, hunting, fishing, dispersed camping, and collection of special forest products. Prior to the 2003 floods, Road 22 provided part of a loop drive that also connected to several other forest roads. The loop drive commenced at Darrington, followed the paved portion of the Mountain Loop Highway (Road 20) for approximately ten miles to Road 22, and proceeded to the junction with Road 24 (milepost 7.0). The Road 24 intersection is now situated between two washed out sections. The route continued over the top of Gold Mountain, exited at the Road 24 terminus (locally referred to as Dan Creek Road) on the Sauk Prairie County Road, and returned to Darrington.

Local seasonal and traditional dispersed reaction activities provided by the Road 22 system include searching out wild mushrooms and berries. During the winter months, the Gold Mountain area provides low-elevation Christmas tree cutting, collecting seed cones and boughs for wreaths, snowmobiling, backcountry skiing, and other snow-related recreation. Game hunting and fishing are popular and traditional pastimes; game hunting seasons are determined and administered by Washington State Department of Fish and Wildlife.

Proposed Action

Since the Preliminary EA was released for the 30-day comment period, Forest Service and Federal Highways engineers and specialists have continued to fine-tune the design of the proposed bridge, and road repairs. The proposed action has been enhanced with additional information.

The Darrington Ranger District proposes to restore year-round access to Gold Mountain and the Sauk River drainage by removing the existing White Chuck Bridge and replacing the bridge at a site approximately 200 feet down river from the current location; relocating Road 22 upslope from Site #2 (MP 9.4) away from the Wild and Scenic Sauk River; and repairing Sites #1, and #3 through #9 in place. Repair in place would include "dipping"[4] the roads at culvert crossings and upgrading culvert size to meet current Forest Plan, as amended, standards. Details below describe both the flood damage that occurred and the proposed repair, by site number and milepost location:

This proposed action meets the purpose and need to restore a more year-around access. It meets goals and objectives outlined in the Forest Plan, as amended; which include managing the transportation system at the minimum standard needed to support planned uses and activities, and provide for public safety (USDA FS 1990, p. 4-7). This proposed action would contribute toward meeting the desired conditions for the Road 22 and would align road maintenance—described the Forest-wide Roads Analysis (USDA FS 2003)—with the projected availability of road maintenance funding.

[4] A technique of lowering the road fill in stream crossings so as to minimize fill that is a risk for failure in case of a plugged culvert. Dipping also provides a pathway for high flows to be directed across the road within the natural stream channel, instead of running down the road or ditchline.

Road 22 and White Chuck Bridge

White Chuck Bridge Replacement and Repair of Site #1: The collapsed White Chuck Bridge is located at MP 10.2. The Federal Highway Administration (FHA) documented in a Damage Survey Report (DSR 2003) that "[t]he scope of damage to the bridge superstructure and substructure has rendered the existing bridge un-salvageable." The scouring force of the water undermined the southern end of the bridge, collapsing it. When the south end of the bridge collapsed, the standing portion of the bridge support skeleton became twisted and lost structural integrity. The north end was severely damaged with scour beneath the footings; floodwater washed away fill material and left a large hole in the road behind the bridge abutment. Refer to the project files for the Damage Survey Report.

Repair Site # 1 below is located just past the collapsed bridge at MP 10.1 (T31N, R10E, Section 14) (Figure 2). The flood washed away about 150 feet of roadway and 120 feet of riprapped slope protection. Also lost were dispersed campsites located in an old campground (see Affected Environment). The road damage at Site #1 now blocks access to the White Chuck Bench Trail 721 (located 0.5 mile from the bridge on Road 2200-13) and the White Chuck Boat Launch (0.25 mile beyond the bridge on Road 22). Site # 1 is addressed with the White Chuck Bridge because the new proposed north approach to the bridge replacement would essentially bypass the damage at Site #1, making additional repairs unnecessary.

Figure 2: Photo of Site #1 (Road 22 MP 10.1)

Refer to Alternatives Including the Proposed Action (see Biological Opinion in the project file) for a complete description of the proposed bridge repair. In summary, the collapsed bridge would be removed and a new single lane bridge with double-lane approaches would be constructed roughly 200 feet downstream of the current location (see Figure 6). Old bridge materials would be hauled and disposed of away from the bridge, and away from the river. The channel would be dewatered[5] one side at a time to allow the removal of the old piers without working in the water, with the exception of moving heavy equipment to the work area. The total time to remove the existing piers would be about two weeks of in-channel work per pier.

To install the new bridge, about 1.3 acres of riparian vegetation would be cleared, including second-growth trees with several large conifers over 24 inches diameter at breast height. Large trees removed would be kept on-site or stockpiled for restoration projects. This area would be revegetated after the new bridge and approaches are completed.

To prepare the north-side road prism and approach, a portion of bedrock cliff would be removed (roughly 200 foot-long by 60 feet wide and 60 feet tall), either by excavator or most likely by detonating explosives. Refer to the concurrence letters of the Biological Opinion documents. These documents are available for review at the Darrington Ranger District. The new approach would bypass the damaged area at Site #1.

The proposed steel replacement bridge would be roughly 235 feet long and would span the active channel at the 100-year flood level, with no piers in the active river channel[6]. The abutments would be constructed when the work area is the driest. The abutments would have deep foundations to counter future damage by floods and channel meandering. Refer to Chapter 2, Alternatives and the Biological Opinion for details of the methods of installing the abutments. Riprap would be placed around and below the abutments, for approximately 50 feet upstream and downstream at ach abutment in order to protect the abutments and road fill from lateral river erosion. The top of the riprap would be up to the 100-year floodplain elevation...

After the existing bridge is removed and the new bridge installed, the old road approaches (and the remaining pavement around damage Site #1) would be removed and the area revegetated; refer to Mitigation Measures, Chapter 2.

Site #2(MP 9.4, T31N, R10E, Section 11): This damage site is located at MP 9.4. Four hundred feet of road washed out leaving the boat launch and trailhead landlocked, and matrix lands without access from either Road 22 or Road 24 (see Appendix B). The Sauk River now occupies the damaged site.

The proposed repair bypass of Site #2 (see Figure 3) would include approximately 0.30 miles of road decommissioning on either side of the washout and the removal of five culverts. The reroute would be located at a higher elevation away from the river; using portions of Roads 22-013, 24-023 and Road 24 (see Figure 5). The 22-013 road would require minor reconstruction for its 1.1-mile length, including widening at the White Chuck Bench trailhead for parking. The intersection of Road 24-023 and Road 24 (about 0.5 miles) would require a wider turning radius to allow room for large vehicles to turn onto Road 24 from Road 24-023.

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[5] Water would be diverted away from the work area by using gravel filled bags or streambed material (pers. comm. Peter Wagner, USFS 2005).

[6] Final structural design of bridge would be determined by a Federal Highway Administration (FHA) bridge design contractor. Forest Service engineers would work along with the contractor in formulating final design and implementation. The following descriptions are a preliminary description, based upon consultation with the FHA. Refer to the Project folder for detailed Damage Reports, and engineering designs and descriptions.

Figure 3: Photo of Site #2 on Road 22 (MP 9.4)

The connector road between Roads 24-023 and 22-013 (about 0.5 miles long) would also require fill repair and replacement. This section would also require culvert replacements, the addition of new culverts, and the protection of a historic wooden culvert. Some second growth trees would be cleared, the entire 0.5 miles of road would be reshaped, and new gravel would be added to the surface.

Site #3 (MP 5.7, T31N, R10E, Section 4): A culvert at this site became plugged with debris, forcing water around the culvert, washing out fill and an span of road surfacing and fill measuring 90 feet long by 25 feet wide and 25 feet deep.

Site #4 (MP 5.6, T31N, R10E, Section 4): A blocked culvert failed, washing out a section 60 foot long by 8 foot-wide and 12 feet-deep (see Figure 9).

Site #5 (MP 5.0, T31N, R10E, Section 5): A plugged 48-inch culvert washed away completely. No culvert remains in the roadbed, and 20 feet of residual culvert is lying below the road. Resulting damages include bedload material in the stream above the road, and a loss of fill in the roadbed.

Site #6 (MP 4.3, T32N, R10E, Section 32): The final damage location on Road 22 is at the Road 2210 junction (locally known as the Four-Mile junction). The damage resulted from culvert failures on Road 2210. Three hundred feet of debris and bedload accumulated on Road 22 with loss of fill material at the culvert outlet and damage to the culvert.

Sites #3, 4, 5, and 6 proposed repairs would include installing culverts that would accommodate a 100-year flood flow and meet current Forest Plan standards. The road would be dipped at the culvert sites to reduce the fill at each site, and the fill would be hardened with rock, further offsetting high volume flows.

Road 2210 and Road 2211

Site #7 (Milepost 0.0 to 0.4, T32N, R10E, Section 32): Road 2210 was damaged by heavy ditch scour and plugged culverts, resulting in a loss of fill material.

Repairs to Site #7 would include replacing damaged culverts, repairing heavy ditch scour with backfill, repairing fill loss by shifting the alignment into the hill, and replacing the surfacing and riprap.

Site #8 (Milepost 1.4 T32N, R10E Section 32): At Milepost 1.4, a blocked culvert caused water to flow down the road for 150 feet, washing out the road at a culvert located below the blocked culvert.

Proposed repairs to Site #8 include filling the washout, constructing a flat-bottom ditch from plugged pipe, installing a culvert, and armoring and stabilizing the fill slope.

Road Repair Site #9 (Milepost 0.1, T32N, R10E, Section 32): Road 2211, a spur road that branches off of Road 2210, was washed out by blocked culverts causing backed up water which overflowed the road. This, in turn, caused slope failure, fill loss, and bedload materials six feet deep, upstream from the road.

While Road 2211 is a ML1 (storage), this repair is needed in conjunction with repairs to Road 2210, in order to effectively treat the drainage problems. This repair would include unplugging pipes, removing bedload material, repairing fill failure, stabilizing the fill toe with riprap, and replacing the surfacing.

Figure 4: Flood Damage Map

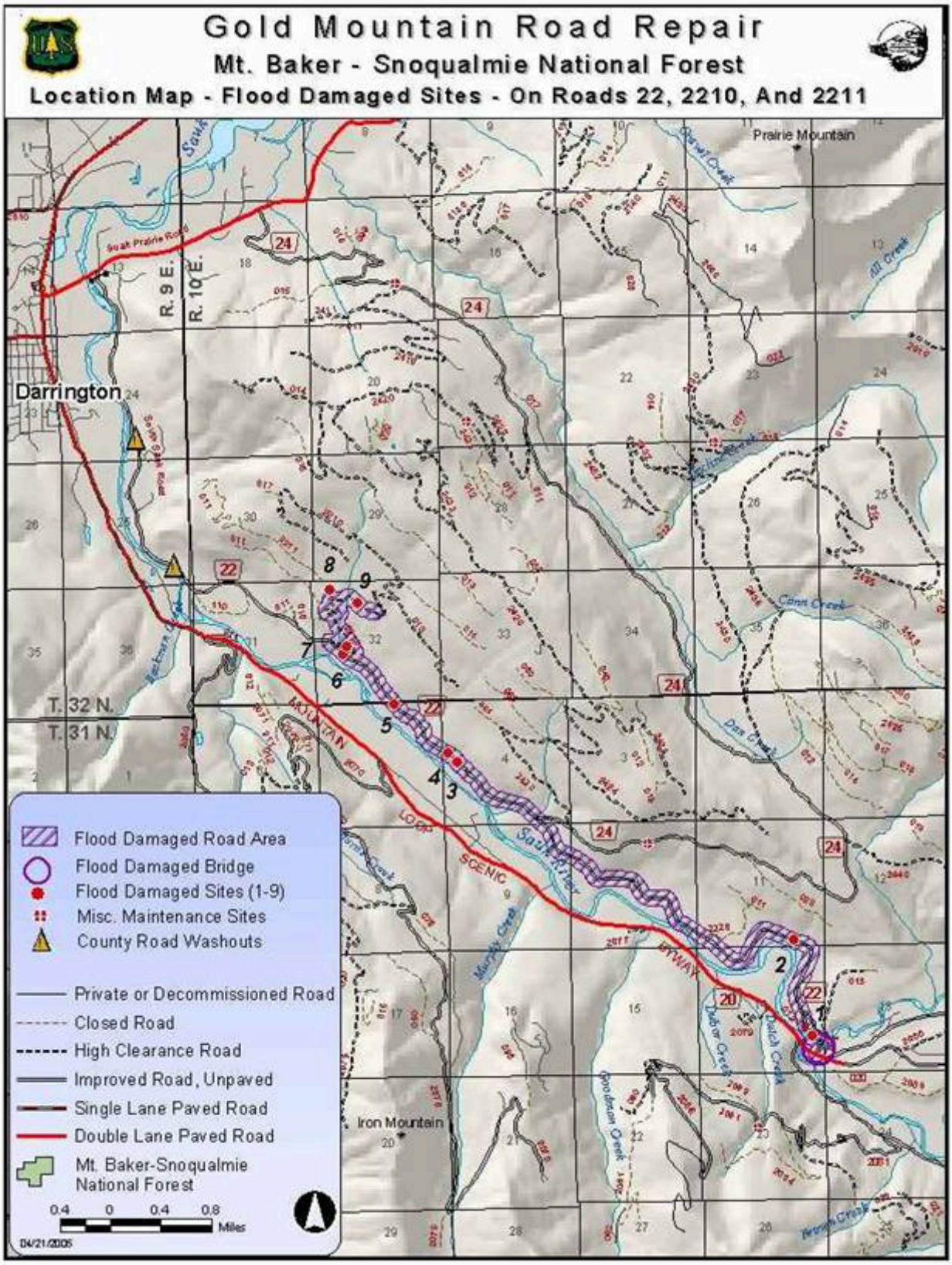


Figure 5: Enlargement of Boat Launch and Trailhead

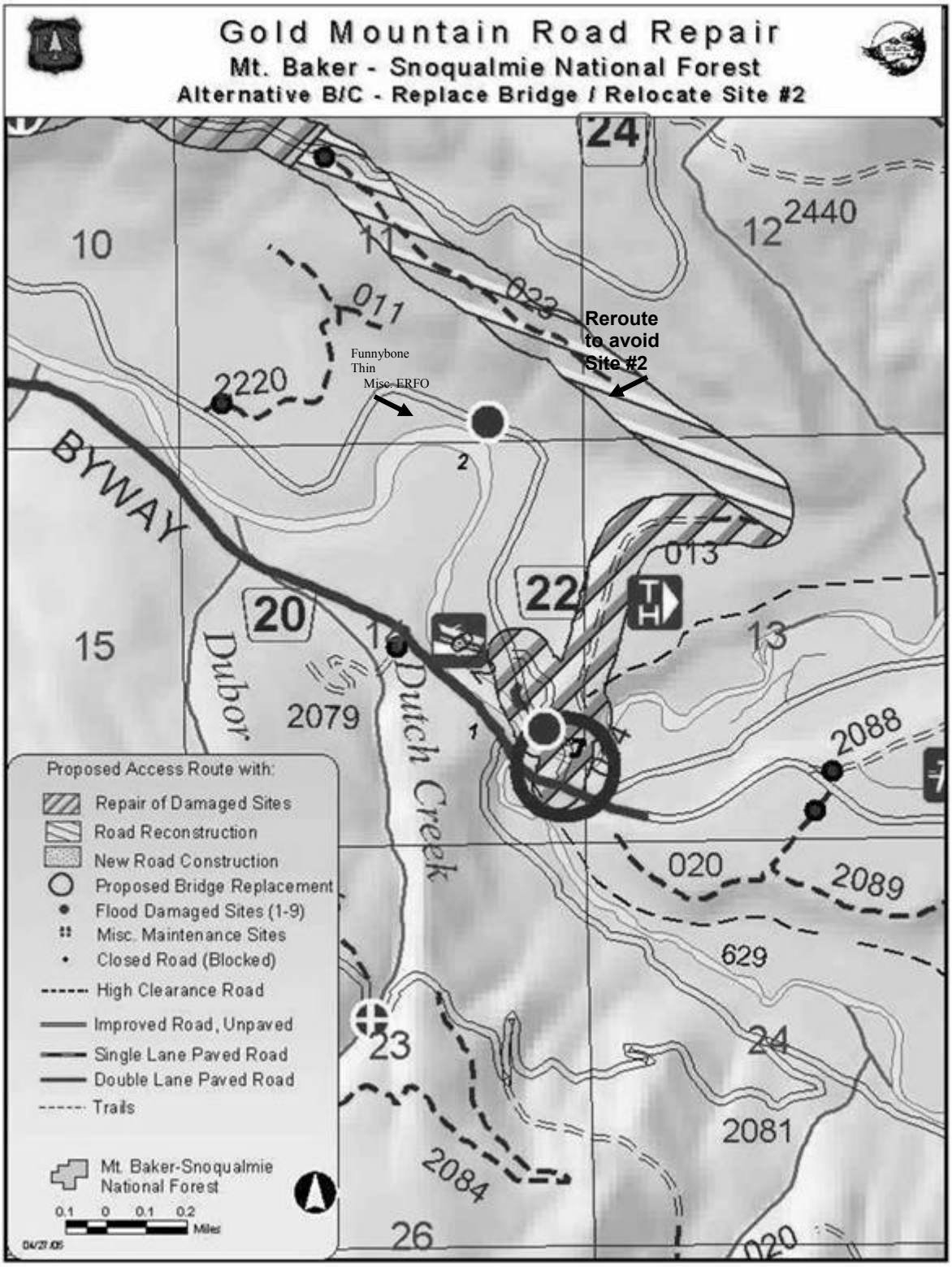
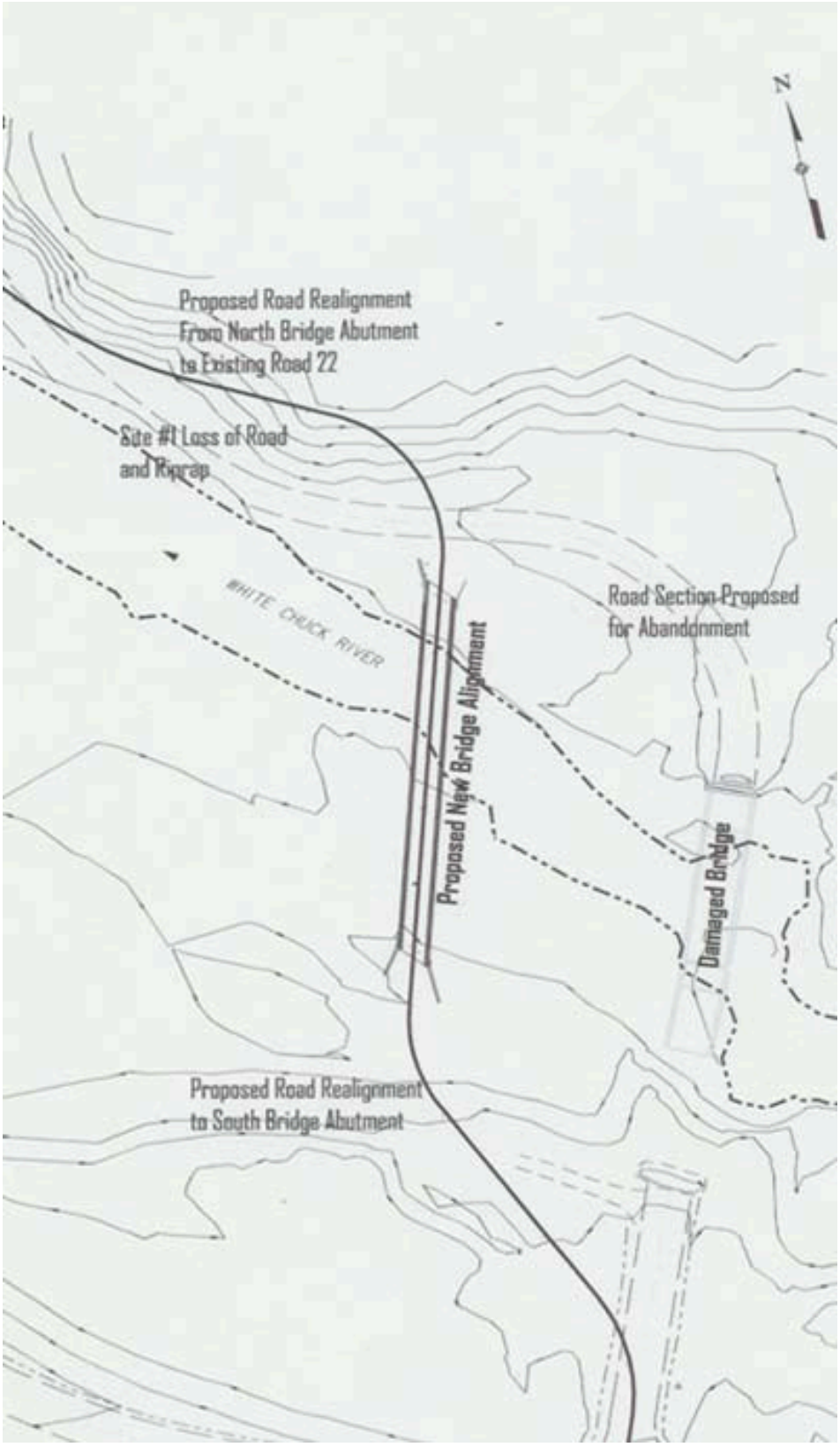


Figure 6: Bridge Replacement Drawing



Project Scope

This EA analyzes the effects of the White Chuck Bridge replacement and Road 22 repairs for the south side of Gold Mountain and part of the Sauk River drainage. These repair sites are all located on the Darrington Ranger District.

Staff on the Darrington and Mt. Baker Ranger Districts are concurrently analyzing several other road systems that sustained damage in the October 2003 floods. As discussed on page 2, a Forest Service team determined that the scattered road damage repairs constitute similar, but not connected actions (see definitions, below). Therefore, for the purposes of site-specific analysis required by NEPA, the damaged sites were grouped by road system into logical geographic areas, to address the site-specific problems or need for action.

The Council on Environmental Quality (CEQ) defines "similar actions" and "connected actions " as follows: "[s]imilar actions" are those that when viewed with other reasonably foreseeable or proposed agency actions have similarities that provide a basis for evaluating their environmental impacts together, such as common timing or geography. An agency may wish to analyze these actions in the same impact statement. It should do so when the best way to assess adequately the combined impacts of similar actions or reasonable Alternatives to such actions is to treat them in a single impact statement. "Connected actions" are those that automatically trigger other actions that may require EISs, cannot proceed unless other actions are taken previously or simultaneously, or are interdependent parts of a larger action and depend on the larger action for justification (CEQ Regulations, 40 CFR 1508.25 (a)(3)) [emphasis added].

A number of minor damage sites scattered across three Ranger Districts were analyzed together; those repairs constitute routine repair and maintenance: the work fit a category and there were no extraordinary circumstances (CEQ 1508.4, Forest Service Handbook 1909.15)].

Decision Framework

Based on the analysis in this document, the Darrington District Ranger (Responsible Official) will decide:

- Whether to build a new bridge across the White Chuck River and repair Roads 22, 2210, and 2211 as proposed, including all associated Mitigation Measures and monitoring requirements,
- To select another alternative, or
- To take no action at this time.

Relationship to the Forest Plan and Other Documents

This project tiers to the *Final Environmental Impact Statement (FEIS)* for the *Mt. Baker-Snoqualmie Land and Resource Management Plan* (USDA FS 1990), as amended. Major amendments include:

- *FEIS on Management of Habitat for Late-Successional and Old-Growth Related Species Within the Range of the Northern Spotted Owl*, *as adopted and modified by the April 1994 Record of Decision* (1994 ROD), which provides additional standards and guidelines (commonly known as the Northwest Forest Plan);
- *Record of Decision Amending Resource Management Plans for Seven Bureau of Land Management Districts and Land and Resource Management Plans for Nineteen National Forests Within the Range of the Northern Spotted Owl to Clarify Provisions Relating to the Aquatic Conservation Strategy* (March 2004); and

- *Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (USDA Forest Service, UDSI Bureau of Land Management 2001), as reinstated by U.S. District Court Order (January 9, 2006), as the ROD was amended or modified as of March 21, 2004.[7]

Note: The 1994 major amendment to the Forest Plan is referred to as "the 1994 ROD."

Land Allocations

The 1994 Record of Decision land allocations amend the allocations described in the 1990 Forest Plan. There is considerable overlap among some allocations, more than one set of standards, and guidelines may apply. In addition, where the standards and guidelines of the 1990 Forest Plan are more restrictive or provide greater benefits to late-successional forest-related species than do those of the 1994 ROD, the existing standards and guides apply.

The 1994 ROD and the 2001 and 2004 amendments include additional forest-wide standards and guidelines. All guide management of this National Forest. The following land allocations (see Figure 7) and designations are found in the analysis area:

Administratively Withdrawn–MA12 Mature and Old Growth Wildlife Habitat Wildlife Habitat (12): These areas were allocated in the 1990 Land and Resource Management Plan to meet management objectives for wildlife species associated with old forests, such as pine marten and pileated woodpecker. Since the 1994 Plan amendment (USDA USDI 1994), large areas of the Forest have been designated for late successional habitat management that incorporated most of the habitat needs for these species. However, a few remaining acres of MA 12 have been determined to be needed. No timber harvest is allowed; new road construction should be avoided.

Riparian Reserves: Standards and Guidelines generally prohibit or regulate activities in Riparian reserves that retard or prevent attainment of the objectives (see 1994 ROD, Road Management p. C32-33).

Matrix-Skagit Wild and Scenic River (MA 6): Management of the Skagit River system is to maintain or enhance: 1) Free-flowing characteristics of each of the four rivers, and 2) Outstanding, remarkable values for which the rivers were placed into the Federal system that consist of Wildlife, Fish, and Scenic Qualities (see *River Management Plan, Final, Skagit River, Vol. II,* p. 4, 1983). This segment of the Sauk River is classified as Scenic. Recreation and Scenic segments, which allow timber harvest—while meeting the management direction for the river—are considered part of the matrix, rather than Congressionally Withdrawn.

Matrix -Recommended Wild and Scenic River (MA 5A): Protection from degradation the outstanding remarkable values and wild, scenic, and recreational characteristics of recommended rivers and their environment, pending decision on inclusion into the National Wild and Scenic River System (see Forest Plan, 4-189, 1990). The White Chuck River segment below the wilderness boundary is proposed as "Recreational."

Matrix -Timber Management Emphasis (MA 17): Most scheduled timber harvest and silvicultural practices are to take place on the portion of the matrix with suitable forest lands. The matrix does include nonforested acres and forest areas that are technically unsuitable for harvest. Plan standards and guidelines address the need to retain coarse woody debris, green trees (singly

[7] This January 2006 Court Order also set aside the 2004 ROD, which removed/modified the survey and manage mitigation measure standards and guidelines.

and in patches), snags and down logs. For the MBS, the 1994 ROD states prescriptions should be developed to address these needs. Silvicultural treatments of forest stands in the matrix can provide for retention of old-growth ecosystem components such as large green trees, snags, and down logs and, depending on site and forest type, can provide habitat for a diversity of species. Access would generally be by road (see 1994 ROD, p. C39-48 Matrix).

Matrix-Scenic Viewshed Middleground (MA 2B): The goal of Scenic Viewshed is to provide a visually appealing landscape as viewed from major travel corridors and use areas. In this area, the Mountain Loop National Forest Scenic Byway is the major travel corridor. The visual quality objective along in MA 2B is Partial Retention. Roads within the seen or potentially seen area should blend with natural form, line, color, and texture. Cut and fill slopes should be revegetated within one year of construction (USDA 1990, p. 4-172-175).

Particularly Relevant Goals, Standards and Guidelines

The following includes some of the most relevant goals, standards and guidelines. However, all applicable goals, standards and guidelines apply; refer to the Forest Plan, as amended, plus the River Management Plan, Final Skagit River (which is incorporated into the Forest Plan) for the complete list.

Roads Management (USDA Forest Service 1990, and USDA, USDI 1994)

***Goals*:** Build and maintain transportation system facilities to the minimum standard needed to support planned uses and activities (1990, p. 4-7).

Manage the transportation system at the minimum standard necessary to provide for public safety (1990, p. 4-7).

Provide and manage roads required to protect and manage the MBS (1990, p. 4-7 and 4-140).

Forest-wide Standard/Guideline, Construction

Roads will be designed, constructed, and/or reconstructed according to standards appropriate to planned uses, activities, safety, economics, and impacts on land and resources, using criteria in FSM 7700 and 7720, or as revised (1990 p. 4-140).

Riparian Reserve, Standards and Guidelines for Roads Management

RF-1: Federal, state, and county agencies should cooperate to achieve consistency in road design, operation, and maintenance necessary to attain Aquatic Conservation Strategy objectives (1994, p. C-32).

RF-2: For each existing or planned road, meet Aquatic Conservation Strategy objectives by:

- Minimizing disruption of natural hydrologic flow paths, including diversion of stream-flow and interception of surface and subsurface flow (1994, p. C-32).
- *Restricting sidecasting as necessary to prevent introduction of sediment to streams (1994, p. C-32).*

RF-3: Determine the influence of each road on the Aquatic Conservation Strategy objectives through watershed analysis. Meet Aquatic Conservation Strategy objectives by:

- *Reconstructing roads and associated drainage features that pose substantial risk (1994, p. C-32).*

- *Prioritizing reconstruction based on current and potential impact to riparian resources and the ecological value of the riparian resources affected (1994, p. C-32).*

*RF-4:*Culverts, bridges, and other stream crossings…shall accommodate at least the 100-year flood, including associated bedload and debris…Crossings will be constructed and maintained to prevent diversion of streamflow out of the channel and down the road in the event of crossing failure (1994, p. C-33).

Key Watershed Standards and Guidelines (from USDA, USDI 1994)

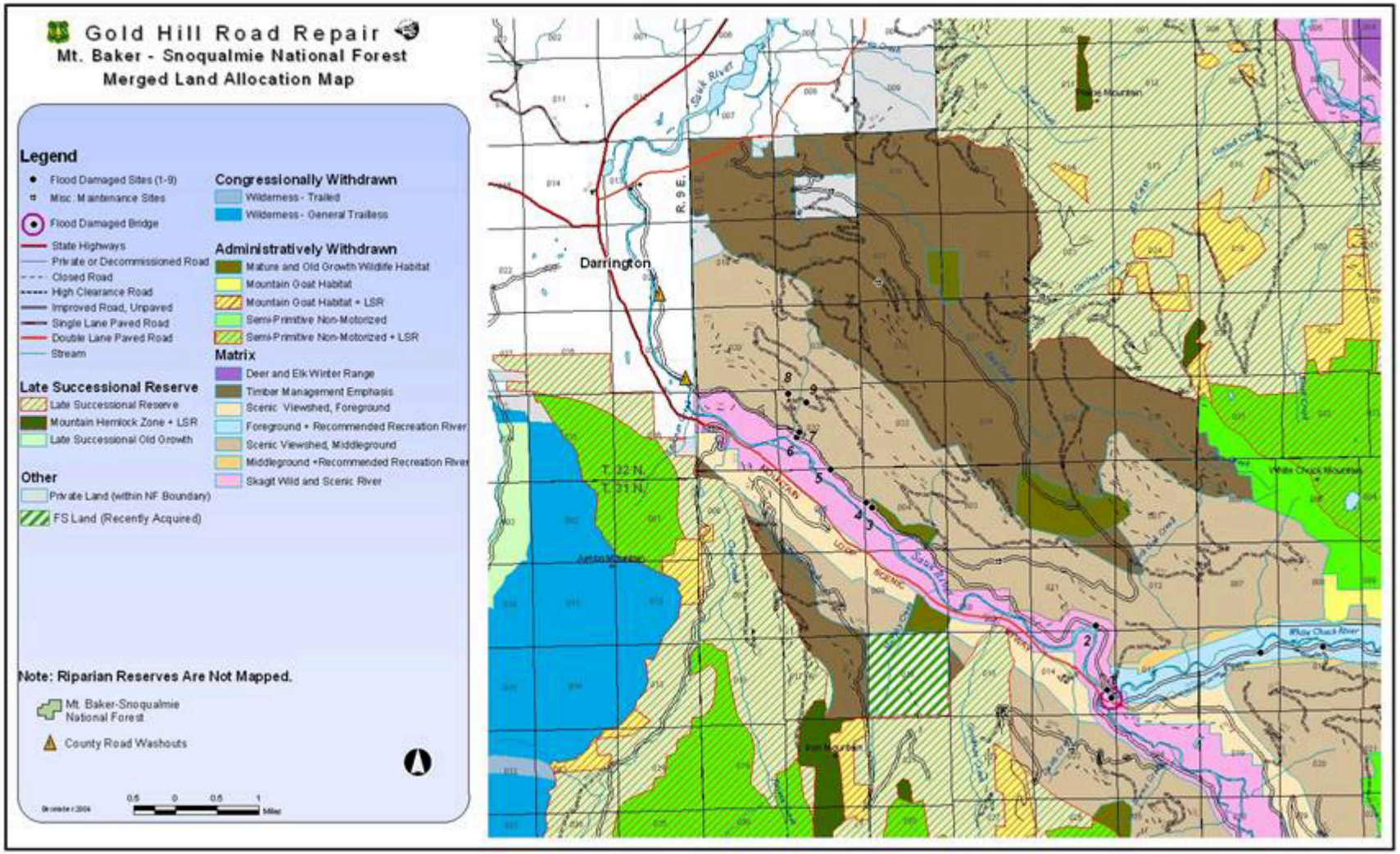
Outside of *Roadless Areas,* reduce existing system and nonsystem road mileage. If funding is insufficient to implement reductions, there will be no net increase in the amount of roads in Key Watersheds.

Key Watersheds are highest priority for watershed restoration.

Recreation (USDA Forest Service 1990)

Goal: Provide a broad spectrum of recreation opportunities and experiences on the Mt. Baker-Snoqualmie National Forest (1990, p. 4-84).

Figure 7: Merged Land Allocations Map



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Relationship to Other Documents

Watershed Analysis[8]

Watershed analyses are completed. *Sauk River and Sauk Forks Watershed Analysis* (USDA FS 1996a) and *White Chuck Watershed Analysis* (USDA FS 2004a) provide a landscape level or ecosystem perspective with findings and recommendations that give the context for road management within the watershed. (For more information, see the individual Watershed Analysis's Finding and Recommendations). These documents describe the current conditions of the rivers, compare historic and current conditions, describe how these ecosystems have functioned and are currently functioning, and describe how they are likely to function in the future. The findings of the watershed analyses are incorporated into this environmental assessment by reference.

Tier 1 Key Watershed: The proposed project is located within Tier 1 watersheds. These watersheds were designated as sources for high water quality and contain at-risk anadromous fish (e.g., salmon) (1994 ROD p. 10). Key watersheds are highest priority for watershed restoration and are considered crucial for maintaining and recovering habitat for at-risk stocks of anadromous salmonids and resident fish species.

Roads Analysis

Forest-wide roads analysis, a process used to inform decisions related to road management, has been completed: *Mt. Baker-Snoqualmie National Forest Roads Analysis*, July 2003. Roads analysis is not a decision-making process but it assesses Forest transportation management needs, long-term funding, and expected ecosystem, social, and economic effects. Each road segment on the Forest was assessed for both access need (e.g. needed for recreation, vegetation management, etc.) and by concern for resource damage. This information can be used to provide the responsible official with critical information needed to identify and manage the Forest road system.

In the management matrix, Road 22 was rated as a High Need for access for recreation; the 2210 and 2211 roads are rated High Need for access to matrix land. See the Environmental Consequences chapter for more information.

Other Relevant Laws and Regulations

Wild and Scenic River Act

Public Law 90-542 amended the 1968 Wild and Scenic River Act by adding the Skagit River to the Wild and Scenic River (WSR) System. The 1983 Skagit River Management Plan identified the Outstandingly Remarkable Values of the Skagit River System as fisheries, wildlife, and scenic quality. The Act designates three river classifications: *wild, scenic,* and *recreation*. The mainstem Sauk River is included as part of the WSR system (1984 Final River Management Analysis and Plan USDA FS 1983). This 50.8 mile-long segment of the Sauk River is classified as *scenic,* which is defined as "[f]ree of impoundments, with shorelines or watersheds still largely primitive and largely undeveloped, but accessible by road in places." Section 15(b) of the Act defines free

[8] Forest Plan, as amended, standards and guidelines for Key Watersheds require completion of watershed analysis prior to management activities other than minor activities (USDA, USDI 1994, page C-7).

flowing as "existing or flowing in natural condition without impoundment, diversion, straightening, riprapping, or other modification of the waterway."

Skagit River Management Plan (USDA FS 1983)

This plan provides the agency with program direction for the Skagit Wild and Scenic River System; it is incorporated as part of the Forest Plan, as amended (USDA FS 1990, p. 4-196).

Endangered Species Act

Section 7 (a)(2) of the Endangered Species Act of 1973 as amended, requires federal agencies to review actions authorized, funded, or carried out by them, to ensure such actions do not jeopardize the continued existence of federally listed species, or result in the destruction or adverse modification of listed critical habitat. The Forest Service consults with the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) if projects could potentially affect listed species or critical habitat. The Forest currently has three programmatic consultation documents with these regulatory agencies that cover much of the Forest's program of activities for several years.

Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act as amended by the Sustainable Fisheries Act of 1996, requires Federal action agencies to consult with the Secretary of Commerce (NMFS) regarding certain actions. Consultation is required for any action or proposed action authorized, funded, or undertaken by the agency that *may adversely affect* essential fish habitat (EFH) for species managed in Federal Fishery Management Plans. For this project, the Pacific Coastal Salmon Plan manages for chinook, coho, and pink salmon. According to EFH regulations, 50 CFR section 600.920(a)(1), EFH consultations are not required for completed actions or project-specific actions with a signed decision under the National Environmental Policy Act, and these regulations enable Federal agencies to use existing consultation and environmental review procedures to satisfy EFH consultation requirements.

National Historic Preservation Act of 1966, Executive Order 11593, 36 CFR 800.9 (Protection of Historic Properties)

Section 106 requires documentation of a determination of whether each undertaking would affect historic properties. The Mt. Baker-Snoqualmie National Forest operates under a programmatic agreement between the Washington State Historic Preservation Officer and the Advisory Council on Historic Preservation for consultation on project determination.

Clean Air Act

The Clean Air Act Amendments of 1977 gives federal land managers an affirmative responsibility to protect the air quality related values (including visibility) within Class 1 areas.

Wilderness areas are designated as Class 1 areas for air quality protection. Visibility is a value that is protected primarily within the boundaries of a Class 1 area, although the Clean Air Act includes provision for definition of vistas integral to a visitor's experience, even if these vistas extend beyond the boundaries of the Class 1 area.

Clean Water Act

The Clean Water Act (CWA) of 1977 and subsequent amendments, established the basic structure for regulating discharges of pollutants into the waters of the United States. It gives the

Environmental Protection Agency (EPA) the authority to implement pollution control programs, and to set water quality standards for all contaminants in surface waters. The Act makes it unlawful for any person to discharge any pollutant into waters of the United States, unless a permit has been obtained under its provisions. The EPA delegated implementation of the CWA to the States; the State of Washington recognizes the Forest Service as the Designated Management Agency for meeting CWA requirements on National Forest System lands.

Section 303(d) of the federal Clean Water Act requires Washington State (Department of Ecology) to periodically prepare a list of all surface waters where pollutants have impaired the beneficial uses of water (for drinking, recreation, aquatic habitats, etc.). Types of pollutants included high temperatures, fecal coliform, excess nutrients, low levels of dissolved oxygen, and toxic substances. The current Washington State list for these Water Quality Limited Waterbodies is dated 1998; a new list is in preparation but has not yet been approved by the EPA. The Forest Service Region 6 and the Washington State Department of Ecology meet this management mandates in part under a Memorandum of Agreement (MOA) with emphasis on reducing effects of roads on water quality.

Executive Orders 11988 (Floodplains) and 11990 (Wetlands)

The purpose of these orders are to "*…avoid to the extent possible the long and short term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development…*" and "*avoid to the extent possible the long and short term adverse impacts associated with the destruction or modification of wetlands…*"

Invasive Species Management

The 1999 Executive Order on invasive species (direction found in Forest Service Manual 2080) the National and Regional strategies for noxious weed management, and the Mediated Agreement of May 24, 1989, identify prevention as the preferred strategy for managing competing and unwanted vegetation. In addition to treatment of known infestations, measures intended to prevent further infestations and weed spread would be incorporated into the construction contract. These measures include cleaning of construction equipment, prompt re-vegetation of disturbed sites, and treatment of known weed sites before they become larger. These measures come from the Forest Plan, Forest-wide Standards and Guidelines Prevention Strategies and Best Management Practices (BMPs) for noxious weeds (Forest Plan Amendment #14, 1999).

A Record of Decision has been signed for the *Pacific Northwest Region Invasive Plant Program: Preventing and Managing Invasive Plants, Final Environmental Impact Statement* (USDA October 2005). To date (January 2006), this decision is under administrative appeal; however, the management direction will be implemented over a period of time, with some standards applicable starting in March 2006. The goals and standards included in this ROD complement the MBS Prevention Strategies and Best Management Practices (Forest-wide Standards and Guidelines) for noxious weeds.

Public Involvement

Following the floods of 2003, a damage assessment was conducted by Darrington Ranger District staff to discover which roads (if any) may need repair. Once the assessment had been completed, the Darrington Ranger District began developing a strategy for repairs to damaged roads. Government-to-Government consultation with federally recognized tribes was initiated, including the Sauk-Suiattle, Nooksack, Lummi, Samish, Snoqualmie, Skagit, Swinomish, Stillaguamish, and Tulalip tribal councils. Following the development of the proposed actions, 457 scoping

letters (dated February 6 and 9, 2004) describing all of the proposed road repair projects were mailed to the tribes and other groups and interested parties. The letter asked those who wished to comment to respond by March 5, 2004.

The following groups, tribes, and individuals responded about this and other proposed flood repair projects with input and substantive comments:

Table 1: Scoping Period Commenters

Shari Brewer, Off the Beaten Path	Marc Bardsley, North Cascades Conservation Council
Connie Kelleher, American Rivers	Thomas C. O'Keefe, American Whitewater Regional Coordinator
Steve Hinton, Swinomish Tribal Community and Sauk-Suiattle Indian Tribe	Eric Myren, Washington Recreational River Runners
Bob Boyd, Individual	Paul Wagner, Individual
Jim Scarosborough, Individual	Alex Kuo, Individual
Devin Smith, Skagit River System Coop.	Chris Detrick, Washington State Department of Fish and Wildlife
Pilchuck Audubon Society	Sauk-Suiattle Tribe
Mr. and Mrs. McIlrath, Individuals	Swinomish Tribe

In addition to the scoping letter, twenty-nine articles regarding the flood damaged roads, trails, and meetings appeared in the Everett Herald, Seattle PI, Tacoma News Tribune, Marysville Globe, Lake Stevens Journal, and Seattle Times newspapers that described the various road projects and whom to contact concerning individual projects. By the end of the scoping period, 16 letters and e-mails specific to the Gold Mountain Road Repair proposal were received.

During May 2004, two public meetings were held: one in Darrington and the second in the Mountlake Terrace headquarters office. Approximately fifty people attended these two meetings and several people provided their name and address so that they could receive further information. Forest Service employees also did several presentations about the flood damage to public and interested parties during 2004.

Two interested individuals and four organizations submitted substantive comments during the 30-day comment period. The Responsible Official considered these comments to obtain useful information from individuals, and use it to enhance project analysis and project planning as per the Supplementary Information for the final rule for Notice, Comment, and Appeal Procedures as published in the Federal Register, 36 CFR Part 215 RIN 0596-AB89, and effective June 4, 2003. Substantive comments were either addressed individually in Appendix A (page Table 24), and/or the information was used in developing the final EA. The table summarizes the substantive comments, responses by the Forest Service. Additionally an index of keywords (Appendix A page **Error! Bookmark not defined.**) was developed to guide the reader to issues and subjects mentioned in the 30-day comment period and other environmental topics of interest.

The Forest Service also used the MBS web site (http://www.fs.fed.us/r6/mbs) to share information on the flood damage, proposed repairs, and the names and addresses of team leaders to contact for comment or additional information.

Significant Issues: Point of Discussion, Debate, or Dispute

Identifying the significant issues provides focus for the analysis. Significant issues are used to develop alternatives to the proposed action, prescribe management requirements and constraints, mitigation measures, and in analyzing environmental effects. Using the comments from the public, other government agencies, and tribes, the ID team developed a preliminary list of issues, separating them into two groups: significant and non-significant issues. The significant issues are those directly, indirectly influenced, or impacted by implementing the proposed action. These issues are general access, potential impacts to fish and fish habitat, potential impacts to Wild and Scenic Rivers, and potential impacts to cultural resources (see below). Non-significant issues are: 1) those outside the scope of the proposed action; 2) already decided by law, regulation, Forest Plan, or other higher-level decision; 3) irrelevant to the decision to be made; or 4) conjectural and not supported by scientific or factual evidence.[9] Appendix A, Table 23 identifies substantive public comments that were considered in developing the following significant issues. It also includes other public comments that were considered as non-significant issues.

The Responsible Official, District Ranger Terry Skorheim, retired, and Jon Vanderheyden, interim District Ranger, identified the following significant or key issues raised for this proposed project:

Issue #1 – General access with and without the White Chuck Bridge and repairs to Road 22, 2210, and 2211:

Without repairs to Road 22, there would be no safe and efficient access to the White Chuck Boat Launch and White Chuck Bench Trail. Roughly 15 percent of the matrix lands in the Gold Mountain area would not be accessible by vehicles. Without repairs, timber haul-cost would increase which would reduce revenues to the government. Partial access to Gold Mountain would be provided by Road 24, but would not include all of the timber management lands or recreational areas.

Measurements/Criteria/Indicators:

a) Accessibility of matrix areas – acres and percentage of matrix accessible/not accessible;
b) Accessibility of safe boat launch and trailhead;
c) Amount of time and length of driving distance to reach various areas on Gold Mountain and the Sauk River, winter maintenance for access.
d) Safety and complexity of road system for access to Gold Mountain, as measured by: degree of grades, elevation, number of sharper corners, road maintenance levels, and road quality—including portions that are single lane gravel vs. two lane paved; and
e) Economics: Costs of repairs, costs of maintenance for all alternatives, cost differences for timber hauling by route, cost of alternate boat launch site development.

Issue #2 – Potential Impacts to Fish and Fish Habitat:

Road repairs or lack of road repairs may impact road drainage and fish spawning and rearing habitat. Increased sedimentation from roads, with or without repair, could impact rearing habitat and sensitive or depressed fish stock. Proposed road and bridge repairs may impact fish found near the bridge or repair sites.

[9] The Council for Environmental Quality (CEQ) NEPA regulations require this delineation in Sec. 1501.7, "…identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)…"

Measurements/Criteria/Indicators : The potential amount of sediment delivery to fish bearing waters, amount of activity within the active channel, short-term and long-term amounts of riparian habitat disturbed and enhanced (acres or linear feet).

a) Amount of fish habitat impacted by road repair: acres of riparian area and/or linear feet of stream reach, and/or miles of road inside/outside the Riparian Reserve of fish-bearing streams;
b) Expected sediment from road repair activities compared to sediment impact from sediment loading in the Sauk River caused by the 2003 flood event;
c) Measurement of fill retained or removed from unstable roads; and

Issue #3-Wild and Scenic River, Potential Effects to the Free-Flowing Nature of Sauk River:

Repairing Site #2 in place would require construction methods that could affect the Sauk River's free-flowing characteristics. Road construction within the Wild and Scenic River (WSR) corridor would require a Section 7 review and approval by the Regional Forester.

Measurements/Criteria/Indicators:

d) Number of sites impacted, linear feet of river impacted or enhanced;
e) Number of sites by alternative with treatments proposed in the bed and bank of the Sauk River; and
f) Effects on the free-flowing characteristic of the river.

Issue # 4 -Cultural Resource – Potential Effects to Historic District

There are known historical and cultural resource sites in the project area. These sites have the potential to contribute toward the Sauk River Timber Lumber Company Historic District. Gold Mountain Road Repair project may impact sites of historic concern.

Measurements/Criteria/Indicators:

a) Number of sites potentially impacted or in need of conservation measures; and
b) Number of sites impacted because of the proposed action and its alternatives.

Alternatives Including the Proposed Action

Introduction

The initial assessment of the repairs and the estimated funding required to repair flood damage was determined through the Federal Highways Administration. Once the Federal Highways Administration finished their input, the individual Interdisciplinary (ID) Teams collated all known information, and developed and refined the proposed action. The Responsible Officials (District Ranger Terry Skorheim, retired followed by Jon Vanderheyden, interim District Ranger) approved the proposed action and its alternatives as well as the issues identified in the previous chapter.

This chapter describes and compares the three alternatives considered for this project. This section also presents the alternatives in comparative form, displaying the differences between each alternative and providing a basis for choice among options by the decision maker and the public.

Process Used to Formulate the Alternatives

In January 2004, Acting Forest Supervisor Robert Iwamoto chartered a team to examine the damages and the possible repairs to the White Chuck Bridge, Road 22, and associated Roads 2210 and 2211 and to present the responsible official with the proposed action and alternatives to it, to return access to the area and meet the need for action

The ID Team assessed the existing conditions for the White Chuck Bridge and damaged segments of Roads 22, 2210, and 2211, as well as surrounding lands that could be affected by the proposed project. The team compared the existing condition to desired future conditions for the area, as established by the Forest Plan, as amended. The team also examined findings from the Sauk River and Sauk Forks Watershed Analysis (USDA FS 1996), the White Chuck Watershed Analysis (USDA FS 2004a), the Forest Roads Analysis (USDA FS 2003) and other laws, regulations, and direction.

Early public participation produced substantive comments from 16 interested organization and individuals. The ID Team reviewed each comment and used this input, issues identified at team meetings, and internal (agency) scoping to identify key issues (described in Chapter 1). These comments were used, in combination with the stated purpose and need for action, to formulate alternatives, design criteria, and monitoring plans.

The No Action Alternative is required (40 CFR 1502.14d). This alternative is used as a baseline to compare the action Alternatives, although it does not meet the purpose and need for action. No action is defined as no change from current management. Current projects and activities would continue, however the stated purpose and need described in Chapter 1 would not be achieved.

All proposed actions would meet existing laws, regulations, and policies. All known threatened, endangered, or sensitive plant or animal species would be assessed for potential adverse impacts, and conservation measures from the Biological Assessment and Biological Opinion would be used to minimize potential impacts. Wetlands would not be adversely impacted. Cultural

resources would be protected in accordance with the National Historic Preservation Act, Executive Order 11593, and other legislation and policy[10].

Alternatives Considered but Eliminated from Detailed Study

When scoping began for the Gold Mountain Road Repair project, there were several proposals to utilize other road segments to access Gold Mountain rather than reconstructing the White Chuck Bridge and repairing Road 22. Road 24 accesses much of Gold Mountain from the north as an alternative route to Road 22, which accesses the area from the south. In addition, historic information indicates that portions of the Road 22 system had washed out before and will likely be subject to future large flood events. Roads rebuilt in the same location, with the same design parameters and configurations, are vulnerable to suffering similar damage as before. This is especially the case if drainage is not adequately designed to accommodate 100-year flow volumes and debris. Thus, the ID Team explored options of other routes and other methods of replacing segments of the damaged road sections.

Remove Bridge and Use Road #24 to Access Area: This alternative would remove the White Chuck Bridge and shift road access to Road 24 (Dan Creek Road). This alternative would route traffic over Gold Mountain on single lane, gravel roads with steep grades, rough surfacing, sharp turns, and an added length to access the general Road 22 area. This preliminary alternative was eliminated from study: use of Road 24 would not meet the need to provide access during the winter months.

Logging activity, as well as other associated management operations, is often relegated to a narrow work window that includes mostly fall and winter months. Seasonal restrictions to avoid sap-flow periods in second growth thinning units are often part of timing-restrictions in timber sale contracts (Forest Service Timber Sale Contract Clause 6.315#-Operating Schedule). Timing restrictions are also used to reduce disturbance during critical breeding periods for federally listed fish and wildlife species.

Road 22 also provides seasonal access to other activities such as snow play and Christmas tree cutting during the winter months. Gold Mountain's north aspect and 3,300 foot elevation allows for snow accumulation on Road 24, which often makes the road impassable to passenger vehicles. Currently there are no maintenance funds available to plow the road.

Road 24 would particularly not serve boaters well because of the road condition and steep grades. Therefore, this option would require another boat launch location.

This alternative was also eliminated from consideration due to the complexity and length of access for general public, commercial vehicles, boaters, and emergency and law enforcement traffic.

Efforts made to find a new boat launch site along the Mountain Loop Highway were not successful. New construction of the launch could include disturbances to the following natural resources: Riparian Reserves, old forest, cultural resource sites, northern spotted owl and marbled murrelet critical habitat, and the potential for erosion and sedimentation impacting water quality

[10] As part of Alternative B and C, Surveys for Threatened, Endangered, or Sensitive Plants and Animals and Proposed Endangered, Threatened, or Sensitive Species or Survey and Manage Species were not conducted. If suitable habitat is present, timing restrictions are incorporated to protect any species that may be present.
All activities implemented as a result of the action Alternatives would be in compliance with the National Historic Preservation Act of 1966, Executive Order 11593, 36 CFR 800.9 (see page 20).

and fish habitat. Other concerns associated with building a new launch include cost of planning and construction, as well as safety factors of sight distance and traffic patterns.

A temporary boat launch site has been established, but it is considered as less serviceable with limited parking for loading and unloading rafts and kayaks, and some safety concerns for pedestrians.

In response to comment received during the 30-day comment period: One respondent discussed repairing the bridge in place as being the original intent of this project. The following paragraph explains the rationale for not considering this option as a viable alternative.

Repair the White Chuck Bridge in Place: This alternative was considered but eliminated from detailed analysis because the assessment of Forest and Federal Highways hydrologists was that repairing the bridge in place had a higher risk of failure than the downstream site. This is because the current bridge site is adjacent to an eroding high bank in the meander bend of the White Chuck River, while the downstream site would be farther from the active erosion.

Figure 8: Example of White Chuck River's Natural Meander Following the 2003 Flooding.

Repair Road 22 in Place: The ID Team examined the possibility of repairing Road 22 in place including repairs at Site #2 (MP 9.4) where the river had removed 400 feet of road. This alternative would have relocated Road 22 away from the river by building about 1,000 feet of new road. This alternative was not developed because field reviews did not reveal a stable site to construct the road. The failed slope is a deep-seated rotational slide area that raised concerns for additional mass wasting and impacts to water resources and fish habitat. Forest staff was concerned about the high probability of recurring failure at this site. Repairing the road with riprap in the active river channel was dropped from consideration due to concerns with impacting the free-flowing characteristics of the Wild and Scenic River.

Connect Roads 2420 and 2210 Upslope Versus Repairing Road 22: This option would have provided access to the northwest end of Gold Mountain by connecting Road 2420-061 with Road 2210-013. This option would have required building a bridge to span a deep drainage. The high cost of a bridge or a road crossing in a riparian ravine of potentially unstable slope eliminated this option from further study.

Connect Roads 24 and 22-013 With Skid Roads: This option would provide access to the boat launch and White Chuck Bench Trailhead with roads constructed on former skid trails of past timber harvest to connect the Road 22 and 24 systems. This option was not developed in detail because both the west and east ends of this route would have severe grades--up to 20 percent in places. The switchbacks at the east end would have very tight radius curves, as well. Portions of this proposed route are currently little more than glorified tractor skid trails (temporary paths for log removal) and would need considerable work to meet desired road maintenance standards. The grade of the skid trails, in this situation, is not suitable for road construction to a standard that would meet road maintenance level 2 or 3 standards. This alternative would create stacked road systems, increasing road density in a Tier 1 key watershed.

Remove the White Chuck Bridge, Repair the County Road from Sauk Prairie Road intersection to Forest boundary, and repair Road 22: At one time, Road 22 was a through-access starting at Sauk Prairie Road just east the Sauk Prairie Bridge (T32N, R 10E, Section 13). The first three miles of the road were subjected to previous flood-caused washouts, and the road was severed at MP 3.0. Since then, Snohomish County has managed the portion of the county road from the junction of Sauk Prairie Road to MP 3.0. The October 2003 storm further damaged the road to the extent that homeowners who lived along this section of road were cut off from reaching their homes by vehicle. The county is reviewing options to repair the road, returning access to those landowners. The ID Team examined the possibility of repairing the road between MP 0.0 and MP 3.0 in cooperation with the County's efforts, and further repairing the Forest Service's portion of Road 22, to eliminate the need to replace the White Chuck Bridge. Forest engineers found that relocation of the road around MP 3.0 would require new easements by the County and include a portion of steep grade. This alternative would entail new ground disturbance and major road construction in slope areas with past histories of slide activity, so this alternative was eliminated from detailed study.

Alternatives Considered in Detail

Alternative A (No Action): No Bridge Repair or Replacement, No Reroutes, No Decommissioning

Selecting the No Action Alternative would mean that no work would be done on the ground at this time. The barricades that have already been placed on Road 22 for public safety would be retained. However, selection of the No Action Alternative would not be a decision either to decommission these roads or to change their current maintenance levels. The damaged bridge would remain in place, with no repairs or structural and debris removal. Road washout locations would remain in post-flood condition; no structures would be replaced or removed, and none of the route would be decommissioned or rerouted.

Motorized access on most of these roads has not been completely eliminated, but has likely been reduced because of the washout obstructions. On the roads beyond the damage sites, recreational use would likely continue, but would be limited to foot traffic, bicycles, and possibly motorcycles and other small-sized motorized vehicle types. In the short term (< 5 years), these roads would begin to brush in, trees would become established, and the road would not be maintained to historical vehicle access levels.

Road maintenance plans for the undamaged portions of the roads would essentially remain unchanged. Approximately 1.0 mile of road between Repair Sites #1 and #2, and approximately 2.2 miles between Sites #4 and #9 would not be maintained because of no vehicle access.

If Alternative A were implemented, no restoration activities would occur. Work on other projects near the Gold Mountain Road Repair project area would be expected to continue. Implementing Alternative A would not preclude other reasonably foreseeable actions in the area (refer to

Alternatives B (Proposed Action): Build New Bridge, Remove Old Bridge, Reroute Road 22 Around Site #2, Repair Sites #3-9

If implemented, Alternative B would include replacing the White Chuck Bridge; with realignment of the bridge approach at Site #1, re-routing Road 22 around and above Site #2, and repairing Sites #3 through #9 in place (see Figure 11). As noted in Chapter 1, Proposed Action, the north approach to the proposed bridge replacement would essentially bypass the damage at Site #1, making additional repairs unnecessary.

Briefly, if Alternative B were implemented, vehicle access would be returned to Road 22 and established Forest Service facilities along the road. Vehicle access to the White Chuck Bench Trailhead and the White Chuck Boat Launch would be restored. Access for dispersed recreational activities would be restored to former levels and access for Forest Service administrators, law enforcement officials, and fire emergency vehicles would be restored. Road 22 would remain open as far as the washout in Snohomish County's jurisdiction (approximately 1.3 miles beyond Road 2210).

The 14,500 acres of Matrix land would be accessible from Road 22, 2210, and 2211; and the logical haul-route to the area would be re-established.

Approximately 0.30 mile of road on either side of Site #2 would be decommissioned and five culverts would be removed as part of this Alternative. **This effort, along with decommissioning Road 22-110 would result in a net loss of 1.10 miles of road in this Tier 1 Key Watershed.**

Seasonal timing for bridgework in Alternative B would meet the in-water work window of July 15-August 15 as listed for the Sauk River by the Washington Department of Fish and Wildlife (WDFW) (for salmon and bull trout). Adjacent upland work could be ongoing before and after the in-water work window. Timing restrictions for northern spotted owl and marbled murrelet nesting seasons would be in place and would be implemented for roadwork within suitable habitat or within 35 yards of suitable habitat during March 1 to August 5. Construction would be completed over two construction seasons during the summer months, when rainfall is significantly less frequent than the rest of the year. All water quality and storm water control standards would be met.

Road maintenance efforts however, would continue as ML3 to the White Chuck Boat Launch and the White Chuck Bench Trailhead. Based on current budget projections, funding for road maintenance will be reduced. Maintenance for Road 22 and 24 (Objective Level ML3) beyond the White Chuck Bench Trailhead will have less brushing and blading, resulting in a rougher, narrower road corridor, which is more comparable to ML2 standards.

White Chuck Bridge Replacement, Repair of Site #1:

The collapsed bridge would be removed and a new single land bridge with double-lane approaches would be constructed roughly 200 feet downstream of the current location.

Damaged Bridge Removal: The old bridge would be removed by first removing the guardrails, sidewalk, and deck. This operation would likely require sawing and breaking of concrete, with the potential for some debris and cooling water (from sawing) to enter the river during the bridge removal. Bridge stringers would be removed by lifting them off the abutment and piers with a crane. The old bridge piers would then be removed by using a hydraulic breaker, hydraulic saw, and heavy equipment. The river would be diverted to one side of the channel[11] at a time, to allow the removal of the two piers without working in the water, with the exception of getting the heavy equipment to the work area. The total time to remove the existing piers would be about one week of in-channel work per pier.

All instream work would be done within work windows set forth by NMFS, USFWS, and WDFW and refined through coordination with these agencies. Conservations measures recommended in the Bull Trout and Chinook Salmon Biological Assessments and Biological Opinion would be enforced during the construction phase.

Bridge Construction: The final structural design of bridge would be determined by a FHW bridge design contractor. The following descriptions are preliminary, based upon consultation with FHW. In addition, the final designs will take into consideration the findings of exploratory drilling accomplished in 2005.

The proposed new bridge would be a single lane bridge with double lane road approaches, constructed approximately 200 feet downstream of the current location and designed to accommodate a 100+-year flood event with clearance to pass associated debris [12] (see Figure 6). The length of the new bridge would be approximately 230 feet (or more) longer than the old bridge, in order to span the active channel. No piers would be constructed in the current river channel.

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[11] Gravel would be pushed into a diversion pile to keep most of the water away from the work area.

[12] Final structural design of bridge would be determined by a Federal Highway Administration (FHA) bridge design contractor. Forest Service engineers would work along with the contractor in formulating final design and implementation. The following descriptions are a preliminary description, based upon consultation with the FHA. Refer to the Project folder for detailed Damage Reports, and engineering designs and descriptions.

To install the new bridge, about 1.3 acres of riparian vegetation would be cleared, including second-growth trees with several large conifers over 24 inches diameter at breast height. Large trees removed would be kept on-site or stockpiled for restoration projects. This area would be revegetated after the new bridge and approaches are completed.

To prepare the north-side road prism and approach, a portion of bedrock cliff would be removed (roughly 200 foot-long by 60 feet wide and 60 feet tall), either by excavator or most likely by detonating explosives. Most of the blast material would be used as fill for the project; any surplus would be disposed of at the White Chuck pit, outside the Riparian reserves and about one-half mile from the bridge. Refer to the Biological Opinion (filed at the Darrington Ranger District). The new approach would bypass the damaged area at Site #1.

The new abutments would be located outside of the active channel and placed at approximately the limit of the 100-year flood elevation, on natural ground rather than fill. They would have deep foundations to eliminate future damage by most floods and channel meandering. The abutments would be constructed when the work area is the driest (see mitigation measures for proposed sediment containment, below). Abutment construction options being considered are spread footings, micropiling, or deep foundations such as drilled and/or driven piling with a poured concrete cap above the ground level designed to counter future damage by floods and channel meandering. The use of drilling would depend upon the substrate. The specific method would be determined following exploratory drilling; however, the choice of abutment construction method would not change any of the effect findings, disclosed in this EA. If pilings cannot be driven, drilling would be necessary. Additional details are provided in the Biological Opinions (Darrington Ranger District files).

Riprap would be placed around and below the abutments, for approximately 50 feet upstream and downstream at ach abutment in order to protect the abutments and road fill from lateral river erosion. The top of the riprap would be up to the 100-year floodplain elevation. This rock would be placed below the ordinary high water (i.e., along the active channel bank plus riprap toe); it should not affect the natural stream characteristics (i.e., depth, velocity, sedimentation). The top of the riprap would reach the 100-year floodplain elevation.

After the bridge abutments are poured, the bridge girders would be placed on the abutments. In order to splice the steel girders, temporary scaffolding would be needed to support the splices. The scaffolding would rest on the streambed and could be in the active channel for up to one month during low water.

The bridge deck and guardrail would be placed last along, with the bridge approaches and paving.

The remaining road fill from the old north abutment would remain in place to help protect the new bridge from the natural channel migration. The south abutment would be removed to the extent possible. The existing asphalt would be removed from the site (including remaining pavement around damage Site #1) and the abandoned portions of the road would be revegetated with native species; refer to the Mitigation Measures and Monitoring for All Action Alternatives section on page 35.

Repair Site #2 (MP 9.4): This damaged site would be completely avoided by rerouting the road on the slope above the Sauk River. The route would include reconstructing Roads 22-013, 24-023, the intersection of 24-023 and an unnamed connector road.

Table 2: Roads and Mileage for Site #2 Reroute

Road	Miles Used
Road 22-013	1.15 (just beyond Site #1) (reconstruction)
Old road/railroad grade	0.50 (between Road 22-013 and 24-023) (reconstruction)
Road 24-023	0.50 (reconstruction)
Road 24	2.00 (maintenance)
Total	**4.15**

Road 22-013 and Road 24-023, and the 0.50 miles connecting road/railway would all require minor reconstruction (including some widening for trailhead parking on Road 22-013). The connecting road between Road 22-013 and 24-023 would require removal of hardwood trees and small coniferous trees (less than 6" dbh). One wooden culvert remains from previous construction. To protect the historical value of the wooden culvert, a new culvert would be placed inside it to support it (see Mitigation Measures). This portion of road would require widening and reshaping of the road prism, adding new culverts and gravel surfacing.

Reconstruction of the intersection with 22-013 and 24 would allow a larger turning radius for anticipated large vehicles (such as a lowboy trailer). Road 24 would require little or no work other than maintenance.

Figure 9: Site #4 Broken Culvert

Repair Site #3-#6: Repairs would include installing culverts that would accommodate a 100-year flood flow and meet current Forest Plan standards. The road would be dipped at the culvert sites to reduce the fill at each site, and the fill would be hardened with rock, further protecting the fill from high volume flows.

Figure 10: Repair Site #7 Culvert Damage

Repair Site #7: Repairs would include replacing damaged culverts, repairing heavy ditch scour with backfill, compensating for fill loss by shifting the road alignment slightly into the hill (several feet), and replacing the surfacing and riprap; a minor amount of hardwoods and shrubs would be removed.

Repair Site #8: Repairs would include filling the washout and constructing a flat-bottom ditch, and cleaning an existing culvert. It would also include installing a 36-inch culvert, armoring, and stabilizing the fill slope.

Repair Site #9: This repair would include unplugging culverts, removing bedload material, repairing fill failure, stabilizing fill toe with riprap, and replacing the surfacing.

Alternative C: Replace Bridge; Repair Site #1, #6-#9, Reroute Site #2-#5; Decommission Road 22 between Road 24 and Road 2210 Junctions

If implemented, Alternative C would include the same repairs and activities described in Alternative B for the bridge, the approaches, and the reroute around Site #2.

However, instead of fixing Road #22 in place at Sites #3 through #5, the Alternative C route would use a portion of Road 24, from the junction of Road 24-023 to Road 2420, plus construction of a segment of new road between Roads 2420-060 and 2210-014 to access the north end of Gold Mountain. This route would be located approximately 1,200 feet upslope of Road 22 and would reconnect to Road 22 by way of Road 2210. Refer to Figure 12, below. Road 2210-014 would require heavy reconstruction (this road was placed in storage status, ML1, in 2003). The reconstruction would require new culverts for the length, including four stream crossings, which would require approximately 36-inch diameter culverts.

The junction of Road 2210-014 and 2420 would be widened to allow for a turning radius for large vehicles.

Road 2420-060 reconstruction would include replacing culverts and adding new ditch relief culverts. The newly constructed road would include large fills and large culverts at two stream crossings.

The segment of Road 22 between Sites #2 and Site #3 (3.45 miles) would be accessible from Road 24. The damage sites would be barricaded for safety. Site #2 and Road 22-110 would be decommissioned as described in Alternative B.

Alternative C, if implemented would result in 2.29 miles of road decommissioning between the junctions of Road 24 and Road 22 and Road 2210 and Road 22. The road would be decommissioned in a manner that would address natural resource concerns, but not preclude foot

traffic. (Note: the route is not being considered for addition to the Darrington Ranger District trail system at this time.)

Road Segments Used Per Alternative

This section provides a summary of the alternate road segments used in each action alternative. Figure 11 Alternative B Route and Table 4 display the mileages of existing road, reconstruction, or new construction by alternative. Table 3 and Table 4 show the pre-flood mileage from the junction of Roads 20 and Road 22 (at the intersection of the Mountain Loop Highway) to the junction of Road 22 and Road 2210. Pre-flood driving distance was 6.76 miles on Road 22. With Alternative B, the driving distance to the same location would be 7.09 miles, where Alternative C the distance would be 9.60 miles.

Table 3: Alternative B Re-route Compared to Pre-flood Mileage to Same Location

Road Segments	Repair Needs	Miles
Pre-flood distance to Road 2210 Intersection on Road 22	---	6.76
Road 22 terminus (Mtn. Loop Hwy jct.) to Road 22-013	New Bridge and Approaches	0.80
Road 22-013	Reconstruction	1.15
"No Number" Road/Railroad Grade	Reconstruction	0.50
Road 24-023	Reconstruction	0.50
Road 24 return to Road 22	None	2.00
Road 22	Repair of Sites #3-#6	2.14
Total Distance Alternative B Reroute to Road 22		**7.09**

Table 4: Alternative C Reroute Compared to Pre-flood Mileage to Same Location

Road segments	Repairs Needed	Miles
Pre-flood distance to Road 2210 Intersection on Rd 22	---	6.76
Road 22 terminus (Mtn. Loop Hwy. Jct.) to Road 22-013	New Bridges and Approaches	0.80
Road 22-013	Reconstruction	1.15
"No Number" Road/Railroad Grade	Reconstruction	0.50
Road 24-023	Reconstruction	0.50
Road 24 to Road 2420	None	1.75
Road 2420	None	1.00
Road 2420-060	Reconstruction	0.80
Connecting Road 2420-060 with the 2210-014	New Construction	0.60
2210-014	Reconstruction	1.00
2210 (Four-Mile Road) Return to Road 24	Repair Sites #7-#9	1.50
Total Distance Alternative C Reroute to Road 22		9.60

Table 5: Alternative B Net Road Mileage Changes

Road	Construction	Reconstruction	Decommissioning
Site #2 (Road 22)	0.00	0.00	0.60
22-013	0.00	1.15	0.00
24-023	0.00	0.50	0.00
"No Number" Road/Railroad Grade	0.00	0.50	0.00
22-110 Decommissioning	0.00	0.00	0.50
Total	**0.00**	**2.15**	**1.10**

Table 6: Alternative C Net Road Mileage Changes

Road/Site	Construction	Reconstruction	Decommissioning
Site #2 (Road 22)	0.00	0.00	0.60
22-013	0.00	1.15	0.00
24-023	0.00	0.50	0.00
"No-Number" Road/Railroad Grade	0.00	0.50	0.00
22-110 Decommissioning	0.00	0.00	0.50
2420-060	0.00	0.80	0.00
New Construction between 2420-060 and 2210-014	0.60	0.00	0.00
2210-014	0.00	1.00	0.00
2210		1.50	
22 Decommissioning	0.00	0.00	2.29
Total	**0.60**	**3.95**	**3.39**

Mitigation Measures and Monitoring for All Action Alternatives

Using the experience and findings of the ID Team and public comments on the proposal, mitigation measures were developed to ease some of the potential resource impacts the various Alternatives may cause. The mitigation measures are applied to any of the action Alternatives.

The determination of effects on federally-listed Puget Sound chinook salmon and bull trout from activities associated with construction of the new White Chuck Bridge, and removal of the damaged existing bridge, is *May Affect, Likely to Adversely Affect* for both species. This effect call under Endangered Species Act consultation regulations required submission by the Forest Service of a Biological Assessment (BA) for each species to NOAA Fisheries (for chinook) and U.S. Fish and Wildlife Service (for bull trout). Submission of each BA was accompanied by a formal request that each agency, in return, provide a Biological Opinion (BO) specifying conservation measures to be implemented to protect the fish to the greatest degree possible during construction activity; stating that project implementation would not result in extinction of the listed populations; and the granting of "incidental take" for adverse effects on the fish through harassment. The BOs, with their terms and conditions, were not received until after the 30-day public comment period on the Preliminary EA. The following management practices incorporate those terms and conditions from the BOs Soils/Aquatics/Fisheries section.

Conservation measures used are from the Standards and Guidelines in the 1994 ROD (USDA FS 1994), BMPs (USDA FS 1988), and Conservation Measures from the fisheries biological assessments (BAs). Selected Terms and Conditions for the White Chuck Bridge removal/replacement from the (USFWS and NMFS) Biological Opinion(s) (BOs) have also been included, along with selected provisions of the existing Memorandum of Understanding (MOU) between WDFW and the Forest Service for hydraulic project permits. Several specific standards and practices are listed here and the applicable measures from the documents above are included in the analysis file or on file at the Darrington Ranger District. Effectiveness of these measures is discussed in these guidelines in relation to species-specific measures or site-specific measures. The evaluation of effectiveness of the measures is assessed in relation to the nature of the effect, the timing of the effect, proximity of the effects, disturbance potential (frequency, intensity, and severity) and in the distribution of the impacts.

Erosion control methods shall be used to prevent silt-laden water from entering the stream. Methods may include, but are not limited to straw bales, silt fencing, filter fabric, temporary sediment ponds, check dams of pea gravel-filled burlap bags or other material, and/or immediate mulching of exposed areas. For all temporary roads where surface water has the potential to enter drainage, the roads would be treated for energy dissipation prior to closure. Treatments could include water-barring, pulling culverts, scarifying to a depth of 12 inches, and seeding with an approved seed mix. Erosion control measures must be in place prior to the normal heavy rainfall period. Streambanks would be pulled back to an angle of natural repose when removing culverts (see Darrington Ranger District file for a description of ROD S&G RF-2, RF-3, RF-5; BMPs R-3, R-12, R-23; BA) Measures are from Best Management Practices (BMPs) and are expected to be effective in avoiding or minimizing impacts based on experience from previous projects and collective experience in developing these measures. Turbidity would be monitored at the White Chuck Bridge (see district files for Biological Opinion).

Repairs along all roads would be monitored during rainy periods and when soils are excessively wet, work would be restricted as necessary to minimize the potential for downstream sedimentation into the Sauk River., BMPs R-3, 20; 13; B-1. The White Chuck Bridge construction site would be inspected after the first heavy fall rain with corrective measures taken if needed and feasible (see district files for Biological Opinion).

Roads would be minimized in Riparian Reserves; location, design, and (re)construction of necessary crossings should be based on methods that minimize disruption to natural hydrologic

paths and adverse effects to aquatic resources, including avoiding sidecasting of loose material; new permanent stream crossings would accommodate at least the 100-year flood, including associated bedload and debris. Large woody material removed from an existing culvert inlet would be put back into the stream channel downstream of the culvert unless doing so would cause habitat degradation. Temporary storage piles would not be placed in the 100-year floodplain from October 1 to May 1 (see Darrington Ranger District file for a description of ROD S&G RF-2, RF-4; BMPs R-1, R-6, R-11, R-12, R-14.)

At the White Chuck Bridge removal and replacement sites, instream large wood or riparian vegetation moved or altered during construction would be repositioned or incorporated into riprap where feasible to protect structures and improve instream habitat (BA, BO). The toe of the excavation at the removal site would be stabilized with large wood, appropriately sized rock, and vegetation as necessary to prevent excessive erosion of the new streambanks (MOU, BO).

Construction activities in or adjacent to perennial streams would be conducted during summer low-flow season. Design, construction, and maintenance procedures to limit sediment delivery to streams from the road surface would be applied. Outsloping of the roadway surface is preferred unless outsloping would increase sediment delivery to streams or where outsloping is infeasible. Road drainage would be routed away from potentially unstable channels and hillslopes. Wastewater from project activities and water removed from within the work area would be routed to an area landward of the ordinary high water line to allow removal of fine sediment and other contaminants prior to being discharged to the stream (see District file for a description of ROD S&G RF-5; BMPs R-1, R-3, R-4, R-5, R-7, R-8, R-9, R-11, R-12, R-14; BA).Clearing and grading would be limited to the minimum necessary to complete the project. Boundaries of clearing would be clearly marked. Removed debris would be disposed of at an appropriate upland location.

Measures would be incorporated into the design of the White Chuck Bridge south approach to pass high flows. Measures include final design considerations would take into consideration installing a relief culvert in the proposed embankment, if needed.

To minimize effects to water quality, a hazardous spill plan and clean-up materials would be available on-site; any machinery maintenance involving potential contaminants (fuel, oil, hydraulic fluid, etc.) would occur at an approved site or outside the Riparian Reserve; prior to starting work each day, all machinery would be checked for leaks and make all necessary repairs. (BMPs W-4; BA). Fueling and maintenance of equipment would occur more than 300 feet from surface water or wetlands, to the extent practical.

Any blasting to occur adjacent to the White Chuck or Sauk River would be done during timing windows approved through consultation (BA, BO). Timing restrictions would help avoid or minimize effects to species of concern, and is a measure approved by the NMFS and the USFWS. For the new White Chuck Bridge approach, geotechnical information would be used to finalize a location to try to minimize the area requiring blasting, create a blast plan, and use delayed detonations of 50 milliseconds wherever practical (BO). In order to control and disperse water on the hillslope, waterbars, or other structures would be installed on roads with spacing and number of these cross drains determined by a Forest Service representative (BMP R-1, R-2). Project-caused unstable slopes would be stabilized as soon as possible. A monitoring plan would be developed in conjunction with USFWS and NMFS, to evaluate the distance and intensity of underwater concussive sound generation from blasting rock and bedrock on the adjacent riverbanks.

To avoid potentially stranding fish during the removal of the old White Chuck Bridge, the site would be dewatered in a way to allow fish to exit. In dewatered areas, visible fish will be netted and returned to the river away from the project action site.

Permits and Regulations

The project implementation would include conditions found in a Hydraulic Project Approval (HPA) permit provided by Washington State Department of Fish and Wildlife (WDFW). Work would be conducted according to established work windows refined in coordination with National Marine Fisheries Service (NMFS), National Fish and Wildlife Service (NFWS), and WDFW.

Conservation measures for the project would include those listed in the Soils/Aquatics/Fisheries mitigation measures on page 35, and effectiveness would likely be high based on experience gained from previous projects (over twenty years of watershed restoration on the Forest), and collective experience in developing these measures (see Best Management Practices).

Wildlife

Project activities, which generate noise above background level, and are adjacent to suitable murrelet nesting habitat would be restricted between April 1 and August 5. Activities occurring between August 6 and September 15 would occur between two hours after sunrise to two hours before sunset. Timing restrictions would eliminate sources of disturbance during the critical breeding period (Biological Opinion of the Effects of the Mt. Baker-Snoqualmie National Forest Program of Activities for 2003-2007 on Marbled Murrelets and Northern Spotted Owls (FWS Reference Number 1-3-02-f-1583, USDI, 2002). Effectiveness of measures is discussed in the above document in relation to species-specific measures and site-specific measures. The evaluation of effectiveness of the measures is assessed in relation to the nature of the effect, the timing of the effect, proximity of the effects, disturbance potential (frequency, intensity, and severity) and in the distribution of the impacts.

Project activities adjacent to suitable spotted owl nesting habitat that generate noise above background ambient levels would be restricted between March 1 and July 15. This restriction avoids additional disturbances to adjacent stands during the critical breeding period of the spotted owl, and marbled murrelet. Timing restrictions would eliminate disturbance during the critical nesting period (Biological Opinion of the Effects of the Mt. Baker-Snoqualmie National Forest Program of Activities for 2003-2007 on Marbled Murrelets and Northern Spotted Owls (FWS Reference Number 1-3-02-f-1583, USDI, 2002[13]).

There shall be no repair work at the White Chuck Bridge site, MP 9.4 on Road 22 or decommissioning work on Road 22-110 during the bald eagle foraging season from November 30 through February 28 on the Sauk River. Since vehicle traffic can be heard approaching and passes quickly, eagles become acclimated to vehicle traffic and are less likely to flush than from foot traffic (Stalmaster 1975). The effectiveness of this measure in minimizing impacts from repair work would be expected to be successful because since timing restrictions would eliminate disturbance during the critical nesting period (Biological Opinion of the Effects of the Mt. Baker-Snoqualmie National Forest Program of Activities for 2003-2007 on Bald Eagles (FWS Reference Number 1-3-02-f-1583, USDI, 2002)

Down logs and concentrations of larger rotten logs would be left on-site, and left undisturbed, where possible, to retain their habitat values in riparian areas. Identified areas with high wood concentrations have been successfully left in previous projects on the District, and are currently

[13] This Biological Opinion also includes effect determinations for spotted owl and marbled murrelet critical habitat, bald eagle, grizzly bear, Canada Lynx, and gray wolf

seen in the retention of the large wood from previous harvests and the diversity of habitat created by the large wood.

Vegetation/Plants/Invasive Species

The 1999 Executive Order on Invasive Species, direction found in Forest Service Manual 2080, the National and Regional strategies for noxious weed management, and the Mediated Agreement of May 24, 1989, identify prevention as the preferred strategy for managing competing and unwanted vegetation. The alternatives analyzed for this project meet the definition for the prevention strategy as defined in these documents. Refer to the project file for the site-specific analysis of the area, as required by the Mediated Agreement.

Reconnaissance of the analysis area has shown where noxious weeds exist. In addition to prevention, early control began in 2000 on these small infestations (by means of hand pulling). Hand pulling is on-going and will continue until all plants are gone and the supply of weed seeds within the soil is exhausted. Two sites of invasive knotweed in the project area will be treated, as per the June 2005 decision on Forest-wide treatment of invasive plants (and New Invaders Strategy). These small infestations are located on Road 24, T31N, R10E, Section 11 and on Road 2200-013, T31N, R10E, Section 13.

Any newly discovered invasive would be documented and prioritized for treatment, as per the MBS New Invaders Strategy, which was added to the Forest-wide Standards and Guidelines via Plan Amendment in June 2005.

For the Gold Mountain proposed road repairs, measures intended to prevent further infestations and weed spread would be incorporated into the project contract. These measures include treatment of known weed sites before they become larger, cleaning of construction equipment, and prompt revegetation of disturbed sites using weed free plant materials and weed free mulch. The measures come from the Forest Plan, Forest-wide Standards and Guidelines, Prevention Strategies and BMPs for noxious weeds[14]. The road repair contracts would be enforced by the field inspector and Contracting Officer Representative.

Treatment for the knotweed at Road 2200-13 would consist of bending the weed stems early in the season and then either spot applying the aquatic formulation of glyphosate with Agri-Dex® surfacatant or injecting the glyphosate directly into the stem of the weed (as per the 2005 Forest noxious weed EA) as well as avoiding the plant during construction so as to not spread it. The other knotweed site is outside any areas to be disturbed. Treatment for the herb Robert would consist of hand pulling, which is effective on this species since it spreads by seed and pulls easily by hand. Treatment for the orange hawkweed would consist of spraying with herbicide (as per the 2005 EA) because hand pulling is ineffective, but the plant does respond to herbicides.

Because of the noxious weeds present, the following mitigation measures are to be part of either Action Alternative:

All equipment and gear should be arrive weed free, and be cleaned before leaving the area to avoid spreading further infestation. Motor vehicles are effective vectors for weed seed dispersal and likely carry seeds a much greater distance than they would normally travel (Schmidt, 1989; Hodkinson and Thompson 1997). Cleaning equipment eliminates this vector. Cleaning can be by any method that removes plant seeds and plant parts from machinery. Existing weeds in areas of construction should be pulled prior to construction activities.

[14] Forest Plan Amendment #14 (1999).

Seed exposed soil with the following seed mix to prevent infestation by weed seeds; Soft white winter wheat (*Cultivar* of *Triticum aestivum)* @ 50 lbs per acre; Slender wheatgrass (*Elymus trachycaulis*) @ 20 lbs per acre; Annual ryegrass (*Lolium multiflorum*) @ 20 lbs per acre; Austrian winter peas (*Pisum sativum arvense*) @ 5 lbs per acre. All gravel, fill, quarry material, and borrow material must be weed free. All straw used as mulch must be weed-free and weed seed-free. Fertilizer is not recommended. Native plant species typically are unable to out-compete invasive plants in disturbed habitats. Seeding and mulching disturbed sites with non-invasive seed mixes reduces the chance of noxious weeds getting a foothold there (USDA FS 2004b).

If any Sensitive or Survey and Manage species are found during project implementation, work would cease and the field inspector would contact the District Botanist to determine appropriate mitigation measures.

Heritage Resources

The following mitigation measures were developed in order to minimize impacts to the intact features and document any historic properties. These mitigations result in No Adverse Effect to the Sauk River Lumber Company district.

Fill would be used to raise the roadbed (former railroad grade) to gain the minimum width necessary for today's standards. The fill will also help preserve the existing through-cuts. A Geo-tech barrier would be placed on the railroad grade bed prior to any addition of fill. This barrier would act as a marker to preserve the original grade depth so it can be identified in the future.

In locations with wooden culverts, a new culvert would be placed within the existing wooden culvert. When possible, all existing element of the wooden culvert would remain in place and be completely re-buried. If elements need to be moved, removed, and/or modified to accommodate the new culvert this would be documented through field notes and photographs. This measure would be effective in avoiding removal of the wooden culvert.

Re-engineering the corner of 24 and 24-023, (the original location of the wye switch) would be monitored. At a minimum, a survey would be conducted following vegetation removal and prior to road construction. If any previously unidentified features or artifacts[15] were encountered during construction, reasonable steps would be taken to avoid or minimize harm until a Forest Heritage Specialist can assess the find and fulfill the requirements of the Programmatic Agreement. This measure would be effective in documenting the site and features.

Previously existing pullouts would be used as much as possible and no new pullouts would be constructed in through-cuts effectively avoiding impacts.

[15] Isolated railroad artifacts such as spikes and rail plates do not possess interpretive value and would not require further protection or recordation.

Figure 11: Alternative B Route

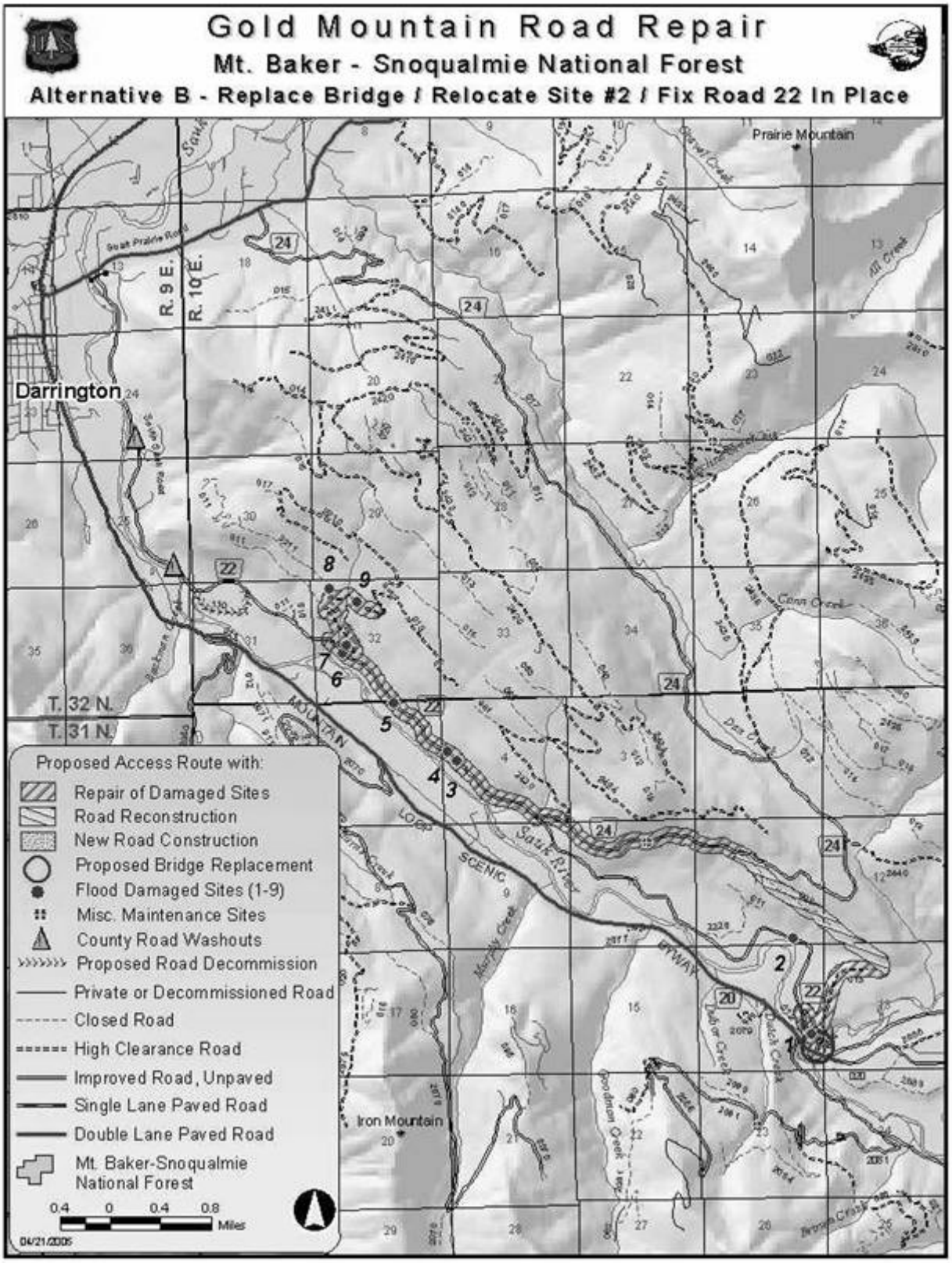

Figure 12: Alternative C Route

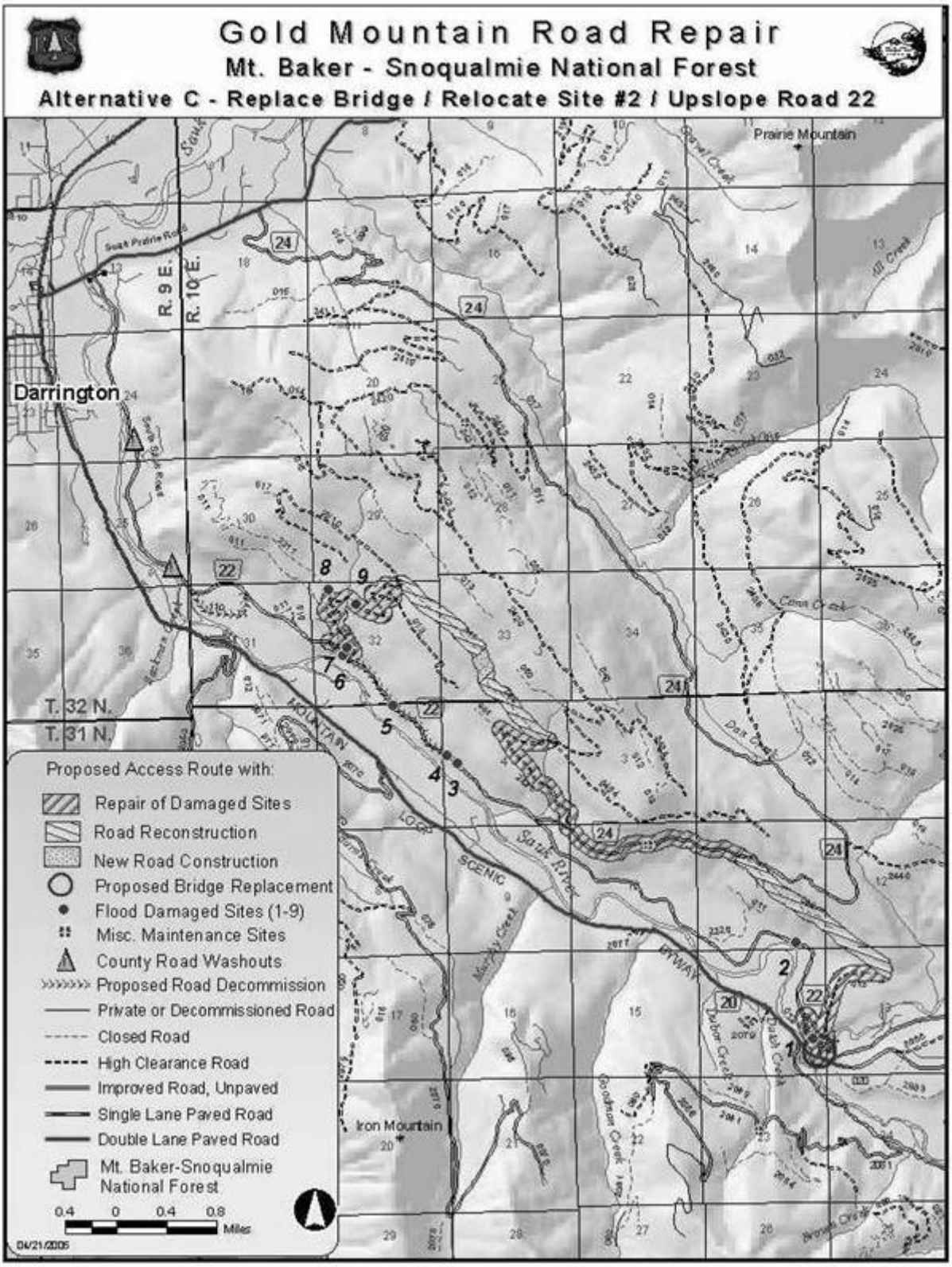

Table 7: Comparison of Alternatives

	Alternative A: No Action, No Bridge Repair, No Reroutes, No Decommissioning	Alternative B: Replace Bridge, Re-Route Site #2, Repair in Place Site #1, #3 to #9, (Preferred Alternative)	Alternative C Replace Bridge; Repair Site #1, 6-9, Reroute Site #2-5; Decommission between Roads 24 and 2210
General Access	Year-around vehicle access would be limited. Winter use of Road 22 would not be possible during much of winter weather. Damaged road would remain blocked. Road maintenance would not occur on damaged roads so eventually the road would grow in. Access to Gold Mountain would be longer and more difficult to travel due to the condition, steep grades, and sharp turns of Road 24. Travel to the general area would increase 30 minutes or more for passenger vehicles (see Table 4.	Vehicular access would be available to the Road 22 system with a reroute. The reroute would bypass Site #2 and travel on 2 miles of reconstructed roads on south end of Gold Mountain (Road 22-013, an old road/railroad, and Road 24-023 returning to Road 22 via Road 24 (Seven-mile) junction). Year-around use may be impacted during heavy snow years by reroute being higher on the slope. Damaged sites on Road 22 (minus MP 9.4) would be repaired and accessible to vehicles. Road 2210 and 2211 would be repaired. The decommissioned road section of Road 22 would eventually grow in and preclude access. Time to travel to the area would increase slightly. Current road maintenance funding for Road 22 and 24, (beyond the White Chuck Bench Trailhead), is insufficent. Therefore, maintaining the road at its current Objective Level of ML3 is not possible. In the future, the roads will receive less brushing and blading, resulting in a rougher, narrower corridor, which is more comparable to ML2 standards.	With Alternative C, vehicular access would be similar to Alternative B, but Road 22 would be decommissioned from Sites #3 to #6 with a reroute upslope, by way of Road 24, 2420, 2420-060, and 2210-014 to 2210. Access to Gold Mountain would be longer and more difficult to travel due to the condition, steep grades, and sharp turns of this upslope route and likely to be impacted by snow more often in the winter months. Road 2210 and 2211 would be repaired. Time to travel to the general area would increase slightly. The decommissioned road section of Road 22 and 22-110 would eventually grow in and preclude access. Current road maintenance funding for Road 22 and 24, (beyond the White Chuck Bench Trailhead), is insufficent. Therefore, maintaining the road at its current Objective Level of ML3 is not possible. In the future, the roads will receive less brushing and blading, resulting in a rougher, narrower corridor, which is more comparable to ML2 standards.
Access to Matrix	Access to Matrix land would be limited to that reachable by the Road 24 system. There would be 2200 acres of Matrix that would not be accessible – 15% of the Matrix in the Gold Mountain area. The commercial haul-route would be longer and more difficult and higher cost for haul. Pre-flood haul cost via the Mtn. Loop was figured at $16.56 CCF. After the flood, the haul cost for timber removed on Gold Mountain with a current sale went to $21.02 Travel time would increase 30 minutes or more (see mileage for Alternatives A-C).	Access would be restored to 100% of Matrix lands, with Matrix accessible by Road 22, 2210, and 2211, and 24, and 24-023 (see Figure 11) Haul costs would be comparable to pre-flood costs of $16.56 CCF. Alternative B would provide a route with $300,000 less in haul costs on 1,900 acres of Matrix managed for timber (minus Riparian Reserves) for the west side of Gold Mountain. Travel time from the junction of the Mtn. Loop (MP 10.9) to the general locations would increase by: 0.33 miles/5 minutes to the Four-Mile junction; and 1.35 miles/3 minutes to the general vicinity the Seven-Mile junction.	Access would be restored to 90% of the Matrix area lands with a small portion of acres along Road 22 less likely to be easily accessible. Matrix areas would be accessible by Road 22, 2210, and 2211, 24, 24-023, 2420, and 24-060. Haul costs would be comparable to Alternative B, but slightly higher due to longer and more difficult travel on steep grades, and sharp turns of the upslope route and likely to be impacted by snows more of the winter months. Travel time from the junction of the Mtn. Loop (MP 10.9) to the general locations would increase by: 2.39 miles and 8 minutes to the Four-Mile junction; and 1.35 miles and 3 minutes to the Seven Mile junction.

	Alternative A: No Action, No Bridge Repair, No Reroutes, No Decommissioning	Alternative B: Replace Bridge, Re-Route Site #2, Repair in Place Site #1, #3 to #9, (Preferred Alternative)	Alternative C Replace Bridge; Repair Site #1, 6-9, Reroute Site #2-5; Decommission between Roads 24 and 2210
Boat Launch/ Trailhead	The developed White Chuck boat launch, parking area, and toilet would not be available. Use of a temporary launch site, would continue until a new launch with safe parking and toilet could be built. Cost of the new launch could be as high as $300,000, or more, depending on its location and material needs, with additional $60,000 in planning costs. The west trailhead for the White Chuck Bench trail would not be available.	Access to the White Chuck Launch would be restored, providing safe parking and efficient pedestrian traffic. Access to the west end of the White Chuck Bench Trail would be restored. The temporary boat launch would be closed.	Access to the White Chuck Boat Launch would be restored, providing safe parking and efficient pedestrian traffic. Access to the west end of the White Chuck Bench Trail would be restored. The temporary boat launch would be closed.
Public Access Safety Emergency Response	Access to the west side of Gold Mountain would be limited to access from Road 24. An additional 30-40 minutes of time to and from sites would need to be factored into response due to steep grades and rougher road conditions than pre-flood conditions. There would be no alternative emergency route to and from the Sauk Prairie (for residences and emergency vehicles) should the main Sauk River Bridge become unavailable, or damaged.	Emergency response from Darrington would be available much as in the past. Safety for travelers would be comparable to prior access, with the variable of a gain in elevation. Travel time from the Mtn. Loop junction (MP 10.9) to the following locations would increase by: 0.33 miles/5 minutes to the 4-Mile junction; 1.35 miles/3 minutes to the general vicinity of the 7-Mile junction.	Emergency response from Darrington to the general area would be available much as in the past. Travel safety is a concern because of the gain in elevation compared to Alternative B, which is located at a lower elevation. Travel time from the Mtn. Loop junction (MP 10.9) to the following locations would increase by: 2.39 miles/8 minutes to the 4-Mile junction; and 1.35 miles/3 minutes to the general vicinity of the 7-Mile junction.
Wild and Scenic River Values	No Action at MP 9.4 of Road 22 would allow the Sauk River to continue to meander with free flow in its channel migration zone. The bridge supports left in the White Chuck River would continue to influence the free flow of a candidate river for the Wild and Scenic River system. The bridge would remain an attractive nuisance for persons attempting to cross the river at this location. Decision on removal of bridge remains would be left to another time. Funding for removal of bridge would be left to another time.	The reroute at MP 9.4 of Road 22 would allow the Sauk River to continue to meander with free flow in its channel migration zone. The White Chuck Bridge replacement would span the White Chuck River and allow for free flowing characteristics of the White Chuck River. The old bridge would be removed, removing a potential attractive nuisance for persons crossing the river at this location.	The reroute at MP 9.4 of Road 22 would allow the Sauk River to continue to meander within its channel migration zone. This would enhance the characteristics for which the Sauk River was designated under the WSR Act, especially free-flow, fisheries, and scenery. The White Chuck Bridge span of the river would improve the free-flowing characteristics of the White Chuck River The old bridge would be removed, removing a potential attractive nuisance for persons crossing the river at this location

	Alternative A: No Action, No Bridge Repair, No Reroutes, No Decommissioning	Alternative B: Replace Bridge, Re-Route Site #2, Repair in Place Site #1, #3 to #9, (Preferred Alternative)	Alternative C Replace Bridge; Repair Site #1, 6-9, Reroute Site #2-5; Decommission between Roads 24 and 2210
Road Maintenance Costs	Barriers on damaged sites would be maintained at a cost of approximate 4 days/year of the road crew time. No decommissioning would take place as part of this Alternative. No change in road maintenance levels. Total road maintenance of project roads (37.7 miles) pre flood was $40,780 based on: 9.4 miles of ML1 –no $, 6.8 miles ML2 =$6,460 ($950/mile), and 21.45 miles of ML3=$34,320 ($1600/mile) After the flood, 17 miles of road are not accessible for maintenance, with 14.7 miles of ML 3, 2 miles of ML 2, and 4 miles of ML1. Road maintenance cost would decrease $15,360 to $25,420 for road maintenance on 16.7 miles of road out of the 37.7 road miles.	The bridge would be removed and a new one built; Site #2 would be rerouted; and the rest of Road 22 fixed in place. Road 22-110 would be decommissioned for 0.5 miles, and 0.3 mile on either side of Site #2 for a total of 1.1 miles decommissioned. Road maintenance cost would decrease to $24,720 based on: 1.1miles decommissioned – no future $ 12.0 miles of ML1 –no $, 24.0. miles ML2 =$22,800 ($950/mile) 1.2 miles of ML3=$1,920. ($1600/mile) Road maintenance cost would decrease $16,060 from pre-flood road maintenance projections on a road system of 37.2 miles, due to shift in funding available for maintenance levels, road decommissioning of 1.1 mile and reconstruction of 0.25 mile of ML2.	The bridge would be removed and a new one built; Site #2 would be rerouted; and the rest of Road 22 reroute upslope on spur roads 2420-060 and Road 2210-014. Road 22-110 would be decommissioned for 0.5 miles, and Road 22 would be decommissioned for 0.3 mile on either side of Site #2, and the 3 miles of Road 22 decommissioned. Road Maintenance Cost would be decrease to $24,910 based on: 3.39 miles decommissioned – no future $ 8.7 miles of ML1 –no $, 24.2 miles ML2 =$22,990($950/mile) 1.2 miles of ML3=$1,920. ($1600/mile) Road maintenance cost would decrease $15,870 due to shift in funding available for maintenance levels, decommissioning and construction of0.5 mile ML2.
Total Cost of Alternative	The No Action Alternative would result in a short-term road decrease in road maintenance and no costs in road or bridge repairs at this time. A decision of No action would defer the following actions to be dealt with at another time, with additional environmental analyses. This would include the following estimated costs: Bridge removal: $150,000 Replacement boat launch, parking and toilet: $250,000 to $300,000 Road repair for Matrix management: $100,000 No Action would likely to result in future needs for $500,000 from capitol improvement funds.	Total cost for implementing Alternative B is estimated at $3,220,000 to $3,420,000 of ERFO funding. Damaged bridge removal and bridge replacement are estimated at approximately $2,800,000 to $3,000,000. Planning, reconstruction, and decommissioning work estimated at $420,000.	Alternative C is estimated at $3,480,000 to $3,680,000 of ERFO funding. Damaged bridge removal and bridge replacement are estimated at approximately $2,800,000 to $3,000,000. Planning, new construction, reconstruction, and decommissioning work are estimated at.$680,000.* *Alternative C may have additional costs with road decommissioning as detailed specifications are developed.

	Alternative A: No Action, No Bridge Repair, No Reroutes, No Decommissioning	Alternative B: Replace Bridge, Re-Route Site #2, Repair in Place Site #1, #3 to #9, (Preferred Alternative)	Alternative C Replace Bridge; Repair Site #1, 6-9, Reroute Site #2-5; Decommission between Roads 24 and 2210
Cultural Resources	Constructed historic landscape features (e.g. railroad grades, through-cuts) would become obscured, and may fail as time goes one. Objects and features made of organic materials would continue to decompose (e.g. wooden culvert). Non-organic artifacts (e.g. cable) would not be disturbed, but would deteriorate over time. Decreased access may have minor beneficial impacts by decreasing access for potential looters and impacts from road maintenance. Tribal treaty rights would remain unchanged; some changes to access by the flood may be beneficial or negative, depending upon the resource locations.	The road reconstruction between 22-013 and 24-023 has potential to impact segments of historic road contributing to the Sauk River Lumber Company historical district. A mitigation and protection plan has been developed in accordance with the programmatic agreement and consultation with Forest resource specialists and the SHPO. Mitigation would reduce the effects to No Adverse Effects to historic properties. Tribal treaty rights would remain unchanged; some changes to the area may be beneficial or negative, depending upon the resource locations.	Same as Alternative B.
Riparian Reserve	Alternative A would not result in any decommissioning activities. Road failures and sedimentation could continue without repairs to culverts.	Alternative B would result in a net decrease of 1.1 permanent road miles in Riparian Reserve. The reroute around Site #2 would move the road away from the Riparian Reserve, but would retain most of Road 22 intact, with potential risk of sediment delivery to the Sauk from the toeslope location of Road 22.	Alternative C has a greater net decrease of roads, 2.79 road miles within the Riparian Reserveswith benefits of reduced road density on a landscape scale. The roads associated with Alternative C are moved upslope from toeslope location and away from the Riparian Reserve.
ESA Fish Habitat	Overall, existing trends in fish and fish habitat would not change directly. Indirectly, this Alternative would incrementally add to existing sediment loads in the watershed which could cumulatively degrade fish habitat downstream (see soils and hydrology), but would not affect fish survival.	Alternative B would maintain overall trends in subpopulation characteristics for federally listed fish. Direct effects could occur in water from concussive sound and vibration associated with work operations. (Further information is available in the fish biological assessment). Indirect effects include fish behavior changes, and displacement of juvenile fish. No decline in population would be expected. Benefits include reduction of sediment, and improved long term in-channel large wood recruitment and transport with road treatments and decommissioning of 1.1 mile of road. The effect determination for federally listed fish for Alternative B is May Affect, Likely to Adversely Affect. Further information is available in the fish biological assessment).	Same as Alternative B with the addition of: Alternative C would reroute Road 22 farther upslope from the Sauk River than Alternative B, with road related sediment farther from fish bearing streams. Alternative C would involve additional road reconstruction as well as some new permanent road construction, but would decommission more road for a total net decrease of 3.5 mile of road. The net decrease in roads has potential reduction in sediment delivery to fish-bearing streams. Effect determination for federally listed fish for Alternative C is May Affect, Likely to Adversely Affect. (Further information is available in the fish biological assessment).

ESA Wildlife Habitat	Alternative A would result in 1.8% additional core habitat for bears in the Bear Management Units (BMUs), There would be less vehicle disturbance within suitable murrelet and spotted owl habitat for 3 miles of Road 22. Bald eagles would not be disturbed by vehicle traffic at MP 9.4 or on the Road 22-110 loop – approximately 0.5 mile of foraging area.	Alternative B would result in a 0.3% increase in bear core habitat within the BMUs. There would be no change in critical habitat for spotted owl or marbled murrelet. Seasonal restrictions are in effect for work on Road 22 so as to avoid noise disturbance during the early breeding season of the spotted owl and marbled murrelet. Seasonal restrictions during the winter months are in effect so as to avoid work disturbance to bald eagles at the White Chuck Bridge, Site #2 (MP 9.4) or on the 22-110 loop – approximately 0.5 mile of foraging area.	Alternative C would result in a 0.1% increase in bear core habitat within the BMUs. There would be no change in critical habitat for spotted owl or marbled murrelet. Seasonal restrictions are in effect for work on Road 22 so as to avoid noise disturbance during the early breeding season of the spotted owl and marbled murrelet. Seasonal restrictions during the winter months are in effect so as to avoid work disturbance to bald eagles at the White Chuck Bridge, Site #2 (MP 9.4) or on the 22-110 loop – approximately 0.5 mile of foraging area.
Hydrology and Soils	With No Action, there would be a continued potential for additional plugged culverts, road drainage problems, and lack of road maintenance. Storm events could trigger further sedimentation and road failure. An estimated 10,000 cubic yards of road fill material would remain in place, having a potential for sediment delivery to the Sauk River. The 2003 flooding and river change resulted in a large amount of large wood and 3-5 feet of sediment deposited in the flood plain and on the gravel bars within the river. During the last two years, high water has mobilized sediment in the river channel and flood plain, contributing to high sediment transport within the river system. Currently (2005), the active channel has cut down through deposited materials and the riverbed consists of mostly sand and cobbles, material that takes higher energy flows to mobilize. Vegetation growth during the last two years in the riparian area would likely assist in the stabilization of flood-deposited material. The collapsed bridge in the White Chuck River channel continues to collect wood debris, and results in river flows being directed towards the Mtn. Loop Highway during flooding conditions.	With Alternative B, repairs to the road system would improve drainage, and lessen the risk of additional plugged culverts and loss of road fill. Storm events could still trigger further sedimentation and road failure. The repairs would reduce the existing road fill up to 4000 cubic yards. Hardening of the crossings with rock would help prevent washouts, and channel diversions. Alternative B would have ground disturbance at the bridge and repair sites along the road proposed repair route, but with the mitigation measures for road maintenance and reconstruction, sediment impacts are expected to be short term, one to two seasons while ground cover becomes re-established. Long-term sedimentation would be reduced.	Alternative C would have similar impacts as Alternative B at the White Chuck Bridge and reroute around Site #2. Repairs to the road system would improve drainage, and lessen the risk of additional plugged culverts and loss of road fill. Storm events could still trigger further sedimentation and road failure. Alternative C would decommission the road section with 10,000 cubic yards of fill and reduced approximately 80% of the fill. Drainage conditions associated with closing Road 22 would upgrade and improve stream flow distributions. Alternative C would disturb approximately 2.3 acres for the 0.6 miles of new road construction. The 0.5 mile road segment being reopened was previously disturbed and compacted.