

MT. BAKER HIGHWAY SCENIC BYWAY MANAGEMENT PLAN

MAINTENANCE OPERATIONS MANAGEMENT PLANS

1. Maintenance: Definition and standards
2. Roadway maintenance standards
3. Erosion control
4. Barriers and guardrail
5. Drainage
6. Seasonal maintenance and clearing to Artist Point,
7. Resource protection
8. Bridges



Maintenance operations management plan

SR 542 is utilized year-round, and has many seasonal challenges: snow, flooding, steep rocky slopes, falling trees and noxious weeds. These are all maintenance responsibilities that require diligent monitoring. While safety and the protection of the state highway is WSDOT's focus, we will also work with USFS to enhance the visual experience of this scenic corridor. Below is a list of maintenance tasks and the agency responsible for carrying them out. The list is divided into seven sections: 1) maintenance definition and standards; 2) erosion control; 3) barriers and guardrail; 4) drainage; 5) seasonal maintenance and clearing to Artist Point; 6) resource protection and 7) bridges. The items included in this section are based on key issues identified in the 2004 easement and are consistent with applicable state and federal highway safety standards.

Maintenance: Definition and standards¹

1. The term "maintenance" means the preservation of the entire highway, including surface, shoulders, roadsides, structures, and such traffic-control devices as are necessary for safe and efficient utilization of the highway (23 U.S.C. 101).
2. Routine maintenance activities are not subject to NEPA requirements. WSDOT will meet Endangered Species Act requirements with respective regulating agencies on all maintenance activities. WSDOT operates under best management practices (BMPs) as described in "Routine Road Maintenance Water Quality and Habitat Guide, Best Management Practices". NOAA Fisheries has stated that prohibitions of section 4(d) of the Endangered Species Act will not apply to actions carried out in compliance with these BMPs. The "Regional Road Maintenance Endangered Species Act Program Guidelines" complies with requirements of the ESA 4d Program.
3. The provisions contained in this section pertain only to maintenance work performed under WSDOT's control that may affect National Forest lands. The local WSDOT maintenance superintendant will coordinate such maintenance activities with local USFS staff.
4. WSDOT maintenance activities coordinated with the USFS shall include, but are not limited to:
 - a. All maintenance activities that involve disposal of slough material, changes in road drainage patterns, and similar actions that affect National Forest lands outside the right of way.
 - b. The development of any material source or storage area not shown on approved construction plans.
 - c. Snow and avalanche control (removal/storage).

¹ The following has been taken from a Memorandum of Understanding NFS OO-MU-11060000-040 between WSDOT and USDA Forest Service Pacific Northwest region "Forest Highways Over National Forest Lands." regarding maintenance standards and responsibilities.

5. For those activities that will be coordinated with the USFS, the USFS will:
 - a. Expedite review and agreement on maintenance items requiring USFS concurrence. USFS will respond within 30 days of receiving the request for concurrence. (Easement section 7b)
 - b. Assist WSDOT maintenance with matters related to equipment parking and materials storage, emergency communications needs, material sources, and designation of slough and slide material disposal areas.
 - c. Advise WSDOT of planned USFS activities that may have an impact on highway maintenance.

Regulations and agreements²

Challenges that exist along a designated scenic byway within a National Forest have been experienced in other corridors. Experts have defined measures that preserve safety and scenic splendor. From this information, agreements and standards have been negotiated to identify methods that should be used to maintain safety and preserve the unique terrain and scenery. Collected below are regulations, agreements and universally applied standards that have been developed to help provide clarity on how to proceed when circumstances require swift action to protect the public, yet also require minimal impact to the roadside diversity.

Roadway maintenance standards

SR 542 from Glacier to Artist Point is a rural, two-lane roadway that serves travelers bound for recreational areas, including the ski area, national forest and scenic vista points. This highway ends at the USFS parking facility at Artist Point. This corridor is designated a Forest Service Scenic Byway and State Scenic Highway. Our goal is to preserve scenic values and provide access to public recreation.

Established maintenance standards and responsibilities ensure that roadways will be maintained according to design or specified maintenance standards. The USFS and WSDOT shall make good faith efforts to be consistent with the standards applied to SR 542. These summaries include terms of negotiated MOUs related to the maintenance of forest highways. Where applicable, federal and state highway standards approved for road maintenance along this corridor, have also been included. WSDOT and USFS shall meet annually to discuss scheduling of maintenance activities and coordinate tasks outlined in this plan to make sure expectations are being met.

WSDOT maintenance responsibilities

WSDOT is responsible for managing the following within the easement limits:

² Summary of efforts coordinated with agreements, defined by regulation, or applied as standard practice by WSDOT and the USFS. A summary of these is included in Appendix 2. These have been developed by the USFS, FHWA, WSDOT, Federal Law, State law, and regional transportation plans. Excerpted sections of USFS and WSDOT objectives for maintenance in National Scenic Byways can be found in Appendix 15.



Masonry cleaning

Rock structures, i.e. bridges and retaining walls, shall be cleaned as necessary.

Painting

Bridges shall be repainted as needed. Use paints recommended for concrete and colors that match existing paint(s).

Routine bridge decks and surface repairs

Repair damage caused by expansion and contraction, wear and tear as soon as possible after detection consistent with budget, time, and available personnel.

Material staging areas

Staging areas are to be kept clean and organized. Place all materials away from view. WSDOT shall remove material off of National Forest System Lands annually or when staging areas are full.

Road shoulders

It will be our policy to blade road shoulders when sand, vegetation, or debris accumulates and causes poor drainage. We will grade away from pavement, restore ground where needed and use the proper shoulder base material when rebuilding eroded shoulders.

Inadequate sight distance

Dense vegetation blocking blind curves, hazards or signs shall be thinned or removed according to the road prism drawing or roadway topography. If necessary, properly sign hazardous conditions.

Transition to undisturbed area

Lack of transition caused by eroding back-slopes, improper removal of vegetation and soil, and long straight clearing lines are to be corrected by thinning or removing dense vegetation and/or stabilizing slopes with bioengineering or structural devices whenever practical.

Vista clearing

Specific areas have been identified as having scenic significance and require vista clearing to enhance viewpoints. WSDOT will maintain the portions of scenic vistas within the easement after coordinating with the USFS. Trimming in areas outside of the easement, that is not required for safety or highway maintenance, will be the responsibility of the USFS crews.

Litter

Debris within the roadway easement may be removed when an existing maintenance activity is taking place. The "Adopt a Highway" partnership is the primary provider of litter control along the state route. WSDOT will supply litter bags and safety materials. The USFS will provide litter cleanup along all pull-outs and other areas outside of the roadway and parking areas.

Utility work



Prior to issuance of utility easements or permits within the roadway prism, the Forest Supervisor will consult with WSDOT regarding standards for the construction and maintenance of the utility facility. Design, construction and inspection, project timing, maintenance, and restoration of the utility facility are items to be agreed upon prior to granting of the utility easement or permit. Extreme care shall be taken in areas where utilities exist within the road corridor, and all utilities shall be located before digging.

Products

These standards apply to products used in maintenance work as required:

1. Traction Sand: Shall meet WSDOT specifications.
2. Herbicide: All herbicides including Round-up by Monsanto or approved equivalent will be used according to manufacturer's specifications. Only herbicides approved by the USFS will be utilized.
3. Product specification on liquid and solid deicing products selected by WSDOT for application along this corridor will be provided to the USFS at the annual review.

Controlling the spread and invasion of exotic plants and noxious weeds

Measures shall be taken to prevent spreading exotic plants and noxious weeds by the use of chemical, manual and mechanical methods within the easement area.

Hazard tree removal

WSDOT shall remove any hazard tree which it deems constitutes an emergency or imminent public hazard. WSDOT will take the lead in the identification and removal of hazard trees and will coordinate with the USFS to notify of the location and size of hazard trees removed and their disposition. WSDOT and the USFS will coordinate annually to review hazard tree removal protocols. The most recent edition of the Forest Service Field Guide shall be used as the protocol for identifying hazard trees.³ These trees will be classified as a "danger" to the traveling public or to employees/contractors working on the highway and will be removed. (See Annual Coordination section for form used to coordinate review with USFS.)

According to the Field Guide, trees have three failure potentials: imminent, likely, or low. Typically, those trees that are classified with imminent failure, which means a potential that they will intersect the travel way or clear zone, represent a danger to the traveling public and workers. See Appendix 15 for additional discussion on hazard tree removal guidelines.

Erosion control

WSDOT will protect the environment by utilizing Best Management Practices (BMP) that prevent or minimize erosion and the transport of sediment. These include various actions that have been agreed upon with the USFS to prevent scour from within the

³ "Field Guide for Danger Tree Identification and Response" (Toupin, R., and Barger, M., 2008, USDA Forest Service, USDI Bureau of Land Management, R6-NR-FP-PR-03-05, 64p.).



Right of Way and the easement and are consistent with applicable state and federal highway safety standards. WSDOT shall provide for the prevention and control of soil erosion within the right of way and adjacent lands that might be affected by action. WSDOT's goal is to use native grasses as approved by the USFS. WSDOT shall maintain all terracing, leadoff ditches or other preventative works that may be required to accomplish this objective. This provision shall also apply to slopes that are reshaped following slides, which occur during or after construction.

General vegetation clearing

WSDOT can alter or remove vegetation along the roadway within budget and time constraints. Typical reasons for vegetation clearing are:

1. Vegetation covers potential hazards i.e. rocks, logs, posts, abutments, guardrails, or any other low obstruction.
2. Vegetation obscures signs and/or warning devices.
3. Vegetation with root systems, which cause damage to the road surface, safety features or drainage structure.
4. Woody vegetation overhanging roadways is lower than 13 feet 6 inches under snow loads.
5. Vegetation reduces sight distance below minimum design standards.
6. Vegetation has blocked a drainage structure or vegetation is compressed into the roadway under excessive snow loads.
7. Within the operational clear zones, immediately along the roadsides, low growing native species i.e. grasses, ferns, and wildflowers should be encouraged wherever possible. Exceptions are: in and around drainage structures, on retaining walls, bridges, curb cracks and joints.
8. Vegetation classified as noxious weeds or other non-native species requiring control.
9. Moss or lichen is causing accelerated erosion of masonry structures. Vegetation which negatively impacts the scenic view at any designated vista.

Vegetation control

All vegetation shall be controlled manually, mechanically, or chemically. Chemical application must be approved. The following are vegetation removal standards to be used along this corridor.

1. Mechanical mowing shall be performed in a manner consistent with WSDOT standards.
2. Required mowing shall be sensitive to any natural characteristic which adds to the unique features of the byway, i.e. huge rocks or old growth trees.



3. Abrupt cutting edges between undisturbed natural vegetation and cut slopes should be softened by undulated clearing limits.
4. Woody stems are to be cut as close to the ground as possible leaving the cut surface out of sight.
5. Larger plants must be felled away from the roadway. Pruned branches shall be cut close to trunks.
6. Noxious weed control shall be performed in consultation with the Whatcom County Noxious Weed Board. The use of herbicides must be given consideration on a case-by-case basis. Only those herbicides that have been approved for use on National Forest lands will be used.
7. Hand-pulling of noxious weed and exotic species shall be performed in consultation with the Whatcom County Noxious Weed Board where use of herbicides is not advisable. Hand pulling of noxious weeds is typically performed by the Whatcom Noxious Weed Control Board. WSDOT does not have the resources to hand pull weeds.

Disposal of Large Woody Debris

Trees too large (over 12 inches) to conceal along roadsides shall be removed to prescribed staging areas for Forest Service disposal and remain the property of the Forest Service. Smaller logs (less than 12 inches) may be cast to the downhill side of the roadway and if possible out of sight. Chipping is permissible when it can be cast out of sight or hauled to an agreed upon location. Large woody debris can be left in place when it is determined not to be a hazard.

Erosion control

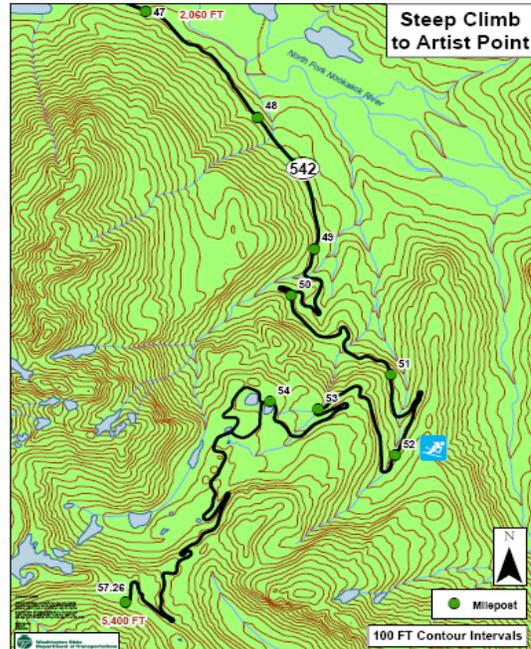
Below is a summary of issues and concerns likely to be encountered on this corridor over time. Each section includes a list of goals and strategies to address them, as well as agreements and guidance that have been previously negotiated regarding actions along this state highway.

Roadside erosion

There are several portions of SR 542 that require slope stabilization to reduce the risk of debris reaching the roadway. Slopes constructed for this roadway are steep and have been destabilized by inclement weather, frost heaves, and general drainage.



“The Climb” up to Artist Point along SR 542 from MP 49 to the top has extremely rugged terrain, with steep slopes, and numerous ridges dissected by small intermittent or permanent drainages.



Slope stabilization

WSDOT’s Geotechnical Branch has developed an “Unstable Slope Management System” that identifies and prioritizes projects in the highway construction program. This system is designed to evaluate all unstable slopes by having engineers perform early project scoping, cost estimation and a benefit cost analysis. Based on this analysis, engineers can prioritize the mitigation of known unstable slopes according to expected benefits. On this corridor there are four areas that have been rated based on identified need and benefit. Below is a summary of these areas as rated in this database. None of these have been found to be a risk to vehicles or have caused any accidents in the last 10 years. The locations do identify areas that require further evaluation and possible stabilization work in the future. This work would be considered a capital improvement.

Unstable Slope Management System Summary for SR 542

	MP	Side of Road	Problem Type
1	41.21-41.26	L	Rockfall/ Catchment
2	43.14-43.30	R	Rockfall/ Catchment
3	52.50-52.65	L	Rockfall/ Catchment
4	53.50-53.60	L	Rockfall/ Catchment

Treatment of steep, raveling slopes

High, bare, rugged slopes and occasional falling rocks are a natural part of the mountainous terrain on the upper part of SR 542. Not every slope that has these characteristics needs treatment.

The basic geological structure of “the climb” up SR 542 is a steep sloped area with fractured granite and little ground cover. Rockslides do occur and are usually caused by periods of heavy rainfall or rapid snowmelt. The photos to the right show the steep road cuts and excavations at locations where rockslides have occurred in the past and steep areas where surface runoff is channeled.

The route is subject to heavy tourist use year-round, with the exception of Artist Point which is only open from July to October, with a significant percentage of the traffic being motor homes and buses in the summer, and skiers traveling the icy roads in the winter. Naturally occurring attributes, such as natural rock faces will be encouraged when stabilization is necessary, but safety and cost factors will contribute to the decision-making process and will be determined on a case-by-case basis.

It might become necessary in the future to provide more visible securing of the rock slide areas to stabilize further rock debris from contacting the highway. The process would require the maintenance office contact the WSDOT soil engineer when any hazardous conditions are noticed to determine appropriate action.

Stabilization improvements may require fractured fin or fractured granite type concrete stabilization barriers. The objective will be to improve safety by eliminating the significant rock slide potential and provide cost effective solutions that maximize the unique visual characteristics of this area. Some form of wall texture would be ideal, and color selected that closely matches the existing granite in the region.

Existing steep slopes that pose problems will be evaluated for treatment and could utilize one of the following methods: toe wall construction, biotechnical structures like brush-layering and willow whittling (when growing conditions allow), terraced slopes, or laying back slopes. Every effort should be made to not create new sliver cuts on existing healed slopes if it is not necessary to safeguard the slope. More detail on these methods can be found in the Maintenance Measures Appendix 15.



Rock faces

Rock faces covered with moss and scattered native vegetation are visually pleasing and contribute to the character of the highway. Cutting rock faces should be avoided if possible. If a cut must be made, the excess rock should be removed along natural fracture planes. Visible drill marks should be avoided. Opportunities for creating planting pockets should be explored. Raw faces should be treated with some type of accelerated weathering agent that gives the rock a natural weathered look.



Before treatment



After treatment

Vegetative management

Vegetation management is part of the normal maintenance of this roadway. The intention is to enhance safety and preserve the vegetative canopy. The forested landscape should dominate the roadside and structures should blend in as much as possible. However, vegetation, if left alone, will grow out of control, blocking visibility of signs, traffic, and wildlife, which could endanger motorists. Weeds must be controlled to avoid impacts on the farming community and native ecosystems. An Integrated Vegetative Management Plan has been developed for this corridor. It will be explained in more detail in vegetative management section of this plan, where guidelines are provided that direct the actions along the roadside of SR 542.

General erosion control

Beyond emergency repair, erosion control is part of the maintenance along the corridor. WSDOT applies BMP guidelines from the RRMP to proactively plan, implement, and monitor activities when undertaking actions to control erosion. All projects that involve land disturbance during construction require a TECS plan. The TECS Plan, in combination with the Spill Prevention Control and Countermeasures Plan will satisfy the requirements of the MPDES/Baseline General Permit.

WSDOT protects the environment by providing stabilization and structural practices that prevent or minimize erosion and the transport of sediment. Effective erosion control helps maintain water quality and drainage while reducing erosion-related costs and facility degradation. Consistent with state and federal highway safety standards, WSDOT shall provide for the prevention and control of soil erosion within the easement. This provision shall also apply to slopes that are reshaped following slides which occur during or after construction.

Winter storm maintenance is only performed under emergency actions. Annually the creek beds are monitored for accumulated debris that needs to be removed if it impedes water flow. This occurs under GHPA's and within the applicable fish windows when the weather improves. Currently this is accomplished in a joint permitting partnership with USFS and WDFW.



To maintain drainage it is necessary to clean excessive brush, debris, and sedimentation from drainage channels. This may require digging out channels with equipment. Routine ditching materials may not be side-cast but will be disposed of at the specified debris storage locations shown in the Maintenance Measures Appendix 15.

WSDOT will maintain drainage by doing the following:

- a. Provide water drainage away from slump areas. Re-establish original contour with suitable material. Utilize vegetation or approved structural devices to protect slopes.

- b. Slides caused by flooding or slope failures may be cleared from roadway by side casting slide debris free of asphalt materials or hauled to temporary storage areas approved by the Forest Service. Side casting materials must not cause erosion problems.

Map 6 shows locations that have required maintenance to minimize erosion of the roadway.

Barriers and guardrail

There are several treatments bordering the highway along SR 542. Some are decorative, some are required for safety. Below are photos of what exists along the corridor today; some are historic, others are temporary.

Concrete stamped barrier- One location along the corridor has rock-faced print on concrete, facing the roadway, located at Half-bridge, the portion facing the roadway. This has not been set as a standard along the corridor, but has been considered visually appealing.



Rock wall- One location along the corridor has a rock wall that appears to be that of the CCC style. It is very appealing. Additions of this style would require a capital funding plan to implement.



Jersey barriers- If jersey barriers are used, they should be treated with appropriate paint to reduce the visual intrusion. The jersey barrier photographed at MP 38.87 has a Cor-10 simulated coloration. Even though this was a temporary measure, these sometimes remain in place after a stabilization effort for three to seven years until a capital project is funded to provide a more permanent solution.



Guardrails- SR 542 has many areas with steep embankments or fixed objects that require protective guardrails to reduce the likelihood of severe accidents. Guardrails prevent vehicles from veering off the roadway. The standard guardrail uses steel rail on wood posts at 6 foot 3 inch centers, and are generally required where there is a drop of 30 inches or more.



The USFS and WSDOT have agreed that the standard for placement and replacement of guardrails will be the use of weathering steel (COR 10 type) guardrails. Some existing steel guardrail still exists. This is being replaced with COR 10 colored rail as repairs are needed and connect to existing COR 10 rail. If a repair is in the middle of a long stretch of existing steel colored guardrail, it will be replaced in kind depending on the length of damage.



WSDOT is responsible for guardrails along SR 542; USFS is responsible for guardrails off of SR 542 serving USFS facilities.

Except for the 2008 Safety project sections, no funding has been requested or secured for additional placement of any barriers along SR 542. Several sections of the route have shoulders with very steep embankments along “the Climb” to Artist Point. These have not had guardrail placed even though the incline is quite steep. Collision data has shown that more precautions in this area would not increase safety, and the visual encumbrances of guardrails would impact the scenic nature of the area.

Seasonal maintenance at Artist Point

The easement specifies that WSDOT and the USFS shall agree on a plan of action regulating vehicle parking, pavement marking, highway signing, end-of-road seasonal gating and closures. The existing facilities have been agreed to by both agencies. Further coordination and planning for additional facilities or changes should be coordinated at the annual meeting so that needed amendments can be accommodated.



A contractual arrangement has developed outside of the easement for the snowplowing of USFS areas within the Heather Meadows Area, and the Firs and Mountaineers adjacent parking areas. It has been agreed that when WSDOT has time and resources, USFS can contract them for the clearing of these areas in the spring. USFS has also worked with Whatcom Parks Department for these services in the past and that is also an option.

WSDOT shall provide highway maintenance, including winter road snow and ice operations. Safety is WSDOT’s primary concern. If conditions are such that safe travel is not possible, WSDOT has the authority to close the roadway.

Seasonal closure/opening at Artist Point

The last 2.5 miles of SR 542 are not maintained year-round. SR 542 closes seasonally at Artist Point after the first substantial snowfall of the year, which usually comes in late September or early October. WSDOT has the authority to gate the road when an unsafe condition presents itself. Currently the roadway is gated to prevent access to Artist Point after the first major snowfall and reopened in the late summer when the snow is cleared. No other closures have been needed.



Snow clearing typically starts in July and is opened to the public after a month long process of snow removal. WSDOT crews start clearing at the milepost 54.7 gate and work their way up to Artist Point, where the snow can be 20 feet deep or more. The highway ends at the Artist Point parking lot, elevation 5,140 feet (MP 57.26). The cost to accomplish this work is about approximately \$40,000 per year.

WSDOT shall clear the parking located at MP 57.2. Snow removal around the restroom is the USFS responsibility. USFS shall maintain comfort stations and associated parking areas. These dates vary based on the snowfall. The decision to open the roadway is at the discretion of WSDOT. Opening and closing dates will be coordinated with USFS.

Snow removal

WSDOT conducts snow- and ice-removal operations on SR 542 from Shuksan Snow Camp. WSDOT maintenance will apply mixed sand in such a manner as to limit and reduce road sand and sediments from entering streams and rivers.⁴

Snow removal shall be performed to the level of service as described in the WSDOT Area 1 Snow & Ice Plan:

1. WSDOT managers are responsible for snow removal on SR 542. Only trained and/or experienced personnel are authorized to operate WSDOT equipment used in snow/ice removal operations. USFS and WSDOT officials shall coordinate the closure to Artist Point. WSDOT shall provide equipment used in all snow removal operations. Seasonal opening shall be performed in the summer to provide the earliest and most economical opening date for Artist Point.
2. Use of explosives in avalanche control area along the highway will be coordinated with the WSDOT and the Mt. Baker Ski Area.
3. WSDOT and USFS shall coordinate all signage for road conditions and chain-up area.

WSDOT is responsible for the clearing of the roadway prism and the easement portion of the roadway. WSDOT is willing to do additional snow clearing work as time permits,

⁴ This will be consistent with the 4(d) Rule guidelines approved by the US Fish and Wildlife Service and National Marine Fisheries Service and established WSDOT Winter Best Management Practices in Snow and Ice Removal.

as long as the associated costs are reimbursed through an established “JA of NA account.” Road safety is WSDOT’s primary concern, and it needs to be clear that clearing of the roadway comes first, and the additional work is only done if time permits.

Avalanche control

The “Galena Slide”, located east of White Salmon lodge requires avalanche control. This service is currently provided by the Mt. Baker Ski Area in their normal course of avalanche control when they are protecting their ski slopes. They are trained and certified. WSDOT coordinates with this team to provide traffic control to safeguard the public when a charge is set off.



Seasonal road maintenance (spring, summer, fall)

Spring brings many of the same issues of winter, but also has more intense drainage problems as the snow melts and discharges glacial materials in the steam beds. Summer has similar snowmelt issues along with additional vegetative maintenance, noxious weed control, and congested public use along many portions of the corridor. Fall brings the possibility of rivers overtopping their banks, localized flooding and the beginning of winter snow issues.

Resource protection

Aquatic and fisheries protection

WSDOT shall protect and preserve the aquatic and fisheries resources within, and/or affected by operation, maintenance, construction or reconstruction activities pursuant to the easement, in substantial accordance with the objectives of the Aquatic Conservation Strategy (ACS) objectives of the Forest Plan.

The Forest Supervisor and WSDOT shall coordinate annually to address aquatic and fisheries resource matters of concern or non-compliance to either party. This annual coordination and consultation may include representatives or guidance from the Washington State Department of Fish and Wildlife, the Lummi Nation, Nooksack Tribe, other federal agencies and other interested parties as may be appropriate. The Forest Supervisor shall initiate this annual coordination.

Natural and cultural resources

WSDOT and the USFS shall make determination as to the necessity for archeological and paleontological reconnaissance and salvage within the easement, to be undertaken by WSDOT per federal standards.

Project review is required for all maintenance and construction projects affecting natural and cultural resources. Project reviews for recurring activities such as ditching, pothole patching,



mowing and slide repairs shall be completed by the USFS under a blanket clearance on an annual basis.

1. Before major work projects begin, such as a major drainage culvert replacement or replacement of historic masonry structures beyond the scope of routine maintenance, a full description of the project must be communicated in writing to the USFS by the WSDOT Maintenance Supervisor. The USFS will review the project and advise the WSDOT supervisor if adjustments to the proposed project are needed and when to proceed.
2. The purpose of the project review is to:
 - a. Assess potential effects from proposed plans and projects on natural and cultural resources (ensuring that projects do not unknowingly adversely affect USFS resources or public lands).
 - b. Ensure compliance with applicable laws, policies and regulations affecting USFS resources and operations.
 - c. Fully explain the need for and thoroughly consider potential effects on resources and alternatives to implementing the project, including alternatives to meet scenic and aesthetic standards
 - d. Facilitate communication among Forest Service staff regarding proposal planning.
 - e. Facilitate the timely accomplishment of projects and plans.

Standard action upon the discovery of archaeological resource:

Procedures identified in federal and state laws and regulations will be followed if an archaeological or paleontological discovery is made as appropriate. Upon discovery of any resources within the easement, WSDOT will comply with the Act for the Preservation of American Antiquities approved June 8, 1906 (34 Stat. 225, 15 U.S.C. 432-433), and the Archeological Resource Protection Act of 1979 (93 Stat. 721, 16 U.S.C. 470aa-47011), and other state laws where applicable.

Bridge maintenance and future capital construction

SR 542 within the National Forest System lands has 11 bridges from MP 35.32 to 53.65. These range in age from 14 to 74 years old, built from 1934 to 1994.

Bridge Inventory SR 542 -USFS	Year Built	MP
North Fork Nooksack Bridge 542/34	1963	35.32
Coal Creek 542/35	1971	35.74
Fossil Creek 542/36	1934	38.65
Half Bridge 542/38	1938	43.2
Half Bridge 542/39	1994	43.23
North Fork Nooksack River 542/40	1957	46.55
Bagley Creek 542/42	1946	49.16
Galena Creek Lower X-ing 542/46	1945	50.38
Razorthone Creek Lower X-ing 542/44	1946	51.28
Razorthone Creek Upper X-ing 542/45	1945	52.09
Galena Creek Upper Xing 542/46	1946	53.65

These bridges will eventually require upgrades and replacement, but no major improvements are funded or scheduled for construction in the next 20 years. Bridge maintenance, beyond the normal roadway clearing and minor repairs, is a capital project requiring funding, and specialized expertise.

WSDOT manages all state-owned bridges using the Washington State Bridge Inventory System, which tracks the condition of all bridges statewide. Bridges along SR 542 are routinely inspected by technical experts to determine the structural condition of the bridges. The condition rating is based on the structural sufficiency standards established by FHWA Recording and Coding Guide for the Structural Inventory and Appraisal of the national's Bridges. This rating relates to the evaluation of the bridge superstructure, deck, substructure, structural adequacy, and waterway adequacy. WSDOT's bridge preservation program consists of the following:

Bridge inspection-Inspect half of the bridges every year unless condition necessitates additional inspections.

Bridge replacement and rehabilitations- repair bridges with deteriorated bridge elements such as concrete columns or floating bridge anchor cables. Replace as needed.

Preservation- Extend bridge service life by repainting steel structures; also repair and overlay concrete bridge decks.

Risk reduction- Seismic retrofit of bridges and scour repair of bridge piers in rivers. This work provides a proactive approach to minimizing bridge damage due to earthquake and high water events.

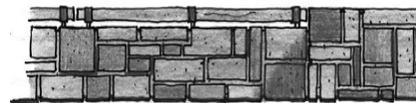
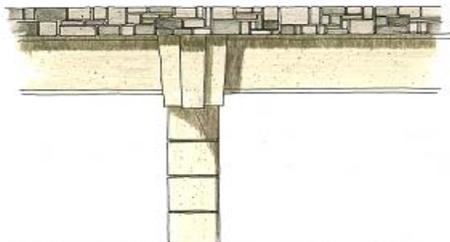
Expectations for new and/or replacement bridges:

- It is anticipated that bridge options will be preferred over culverts where fish habitat will be enhanced, provided that this option is cost-effective.
- Bridge aesthetics should be reviewed by both the USFS and WSDOT to achieve a safe, cost-effective and visually pleasing structure.
- Native stone or native stone veneer should be used on visible inboard faces in a safe manner. Outboard faces should be evaluated individually to determine their visual sensitivity and appropriate type of treatment.
- Existing bridges with incompatible railing designs should be retrofit with new rails that are similar to the designs that have a Cascadian theme. In cases where the structure of the bridge will not support solid stone masonry, stone veneer or similar simulated stone rails may be substituted. The cost of this additional detailing needs to be explored further in terms of grants or other sources of funding.

These requirements are based on provisions in the easement agreement and will add to the cost of future projects along this corridor. The responsibility for aesthetic reconstruction is not budgeted at this time and will require funding partnerships to finance these projects.

Cascadian bridge design:

The Cascadian style is to be incorporated into new projects when visible to the traveling public. WSDOT does not have funding to replace any of the structures along this corridor, but it is hoped that more aesthetically pleasing designs can be integrated when new projects are developed. The conceptual design below shows the Cascadian style and provides a reference for what might be suggested if funding were available.



Bridge Railing Design Concept
Cascadian Architectural Theme
Timber Rail with Stone Finish Formliner

Conceptual designs provided by WSDOT Bridge Architect Paul Kinderman- Winter2008

In Appendix 14 is an inventory of the bridge structures along SR 542. It would be a major undertaking to provide retrofits for existing structures or design standards for future projects. USFS and WSDOT will need to discuss this at the time of pre-construction reviews.