2014

Forest Roads Inventory and Risk Ratings

Forest Road and Trail Inventory, Analysis and Evaluation Tool

The goal of this document is to help the Conservation Planner identify critical items associated with the inventory of forest roads and to recognize erosion indicators & indicators of surface water concentration that are likely to lead to sediment delivery to water courses and bodies.

NRCS WA
September 2014

Forest Road and Trail Inventory, Analysis and Evaluation Tool

*For the purposes of this document, road and road system will include the active and improved trails and trail systems.

Introduction/Background: For Forestland owners, the road system is a very important and costly investment. It is the infrastructure that provides access to the property and forest products. Access through the road system reduces the costs and improves the efficient application of forest management activities, product extraction and provides access for development and recreation. Roads are often considered capial investments. Investmens of this magnitude, need to be protected, managed and maintained to get optimum return on the investments.

According to the State of Washington's Forest Practices Act, RCW76.09.420 1(c)—"Existing forest roads must be maintained only to the extent necessary to prevent damage to public resources". Thus, the landowner also has a regulatory and social obligation to protect the public resources affected by their road system.

NRCS is committed to "Help People Help the Land" by reducing or eliminating resource concerns through the use of conservation planning. Phase 1 (Steps 1-3) of the conservation planning process identifies goals and objectives of the landowner, identifies potential issues and inventories and evaluates resources. When resource concerns are found, steps 4-5 of phase 2 of the conservation planning process uses conservation practices, conservation systems (a group of conservation practices that work together to resolve a resource concern), and/or resource management systems (in which individual practices and conservation systems are put together to treat all the resource concerns found within a planning unit) to address the resource concerns.

Forest roads are infrastructure, like irrigation pipelines, irrigation ditches, fences, barns, stables, shops, and houses. They are the H in SWAPA+H and are normally part of our human considerations in planning. However, much of the infrastructure on working forestlands, farms and ranches that are being used now, were built in a different time, under different standards, technology and environmental knowledge. As time and environmental knowledge improves, new standards and technology are developed and the recognition that this older infrastructure is a source of significant resource concerns. Upgrading the infrastructure is often part of a conservation system designed to reduce or eliminate a resource concern. Below is a list of resource concerns associated with forest road systems.

Resource Concerns Associated with Forest Road and Trail Systems:
Soil Erosion- Sheet, rill and wind erosion; Concentrated flow erosion.
Excess Water- Ponding,flooding, seasonal high water table, seeps, and drifted snow
Water Quality Degradation- Excessive sediment in surface water
Air Quality Impacts- Emissions of particulate matter (PM10) (see AQ TN 1)
Inadequate Habitat for Fish and Wildlife: Habitat degradation
Degraded Plant Condition- Undesirable plant productivity and health; Excessive plant pest pressure

Rill and gully erosion often occur on forest roads and road sides (See photos in Appendix D: Erosion Indicators). If uncontrolled, this type of erosion can lead to other resource concerns such as reduced water quality due to an increase in sediment and turbidity, which in turn degrades the stream habitat for fish and other aquatic species through the reduction of access and quality of food, a reduction in species' abilities to breathe, and reduced cover and space for activities such as reproduction.

Improperly installed, undersized, or damaged culverts, and/or other damaged stream crossing structures, can back up water to the point that it flows over the road. This site condition can increase sediment delivery to water bodies and courses by, at best, simply increasing surface erosion, to, at worst, completely washing out the entire road prism. Undersized, damaged or improperly installed culverts or other damaged stream crossing

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structures can also cause fragmentation of habitat by blocking passage and access to upstream habitat. In addition, erosion of stream banks can be accelerated though the improper sizing or installation of stream crossing structures or from roads running parallel to streams, without proper buffer (35' to 200' as needed) between road and stream (see Bio TN 14, SVAP2 and WQ TN 1 for buffer width guidance).

Riparian areas along water courses and water bodies are high quality habitat for upland species providing quality forage, cover, continuity of habitat and access to water. Sediment and debris from erosion or even worse, mass movement of soil due to road washouts, can damage or destroy this high quality habitat. Furthermore, degradation of stream banks along roads parallel to the water course or bodies could reduce the quality and extent of this special riparian habitat.

Placement of road systems without regard to the land's natural hydrology can cause pirating of water from one drainage to another, disruption of the connectivity of wetland complexes or cause flooding and ponding where it naturally would not occur. These are just a few examples out of many ways roads can be the source of resource concerns. To see examples of indicators of erosion and other resource concerns associated with forest roads go to Appendix D.

Three practices are used to treat forest roads and trails directly and 16 associated and supporting practices:

The three practices that are used to treat the forest roads and trails directly are:

- 560 Access Road (mostly used on roads with vehicular traffic use)
- 654 Road/Landing/Trail Closure & Treatment
- 655 Forest Trails and Landings.

The 16 associated practices are:

- 314 Brush Management,
- 315 Herbaceous Weed Control,
- 342 Critical Area Planting,
- 370 Atmospheric Resource Quality Management (refer to Air Quality TN 1)
- 373 Dust Control on Unpaved Roads and Surfaces (refer to Air Quality TN1)
- 391 Riparian Forest Buffer, (612 Tree/Shrub Establishment might be a substitute for 391)
- 395 Stream Habitat Improvement and Management,
- 396 Aquatic Organism Passage,
- 472 Access Control,
- 484 Mulching,
- 490 Tree/Shrub Site Preparation
- 578 Stream Crossing (mostly used on trails with livestock, people by foot, equipment use)
- 582 Open Channel,
- 584 Channel Stabilization
- 587 Structure for Water Control.

All of these practices are found in FOTG Section IV.

Section V of the FOTG, has the Conservation Practices Physical Effects **(CPPE)** matrix and Section III has the Quality Criteria guidance for each practice. Through the use of the CPPE, along with other evaluation and analysis tools, the Planner can determine the effects of the above individual conservation practices and/or combinations of these practices compared to Planning or Quality Criteria, as part of the conservation planning process. Document your results.

See appendix C for **Analysis and Evaluation of Benchmark Conditions and Proposed Practices**

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Types of Inventory tools and Data to Collect in the Office and Field

Inventory data collected from office sources prior to going to the field can help you target your limited field inventory time to the highest risk segments of the forest road.

See Appendix C for Forest Roads/Trails Inventory worksheets.

Tools:

Office Inventory Tools

- ArcGIS--Topographic map, soils map and geologic map
- Geodata layers: NWI, ESA or PHS, Cultural Resources and 303d waters.
- WA State IMSViewer for Water Typing-http://fortress.wa.gov/dnr/app1/fpars/viewer.htm
- Soil Web Survey Reports: MUD (Technical version); Engineering Properties; Physical Properties; Hydric Soils; Haul Road, Log landings and Soil Rutting; Hazard for Erosion and Suitability for Roads; Compaction resistance, or others....
- Current & historical Aerial Photos—Suggested.
- WA fish passage barrier websites: http://wdfw.wa.gov/conservation/habitat/fish_passage/ and http://www.rco.wa.gov/grants/fffpp.shtml

Landowner or Participant interview is an essential part of both the field and office inventory of roads and trails. These interviews can often lessen our workloads and improve our inventory efficiency by telling us where the worst damage exists and gives insight into the history of resource concerns. Nobody knows the land better than the landowner.

Field Inventory Tools

- GPS unit (See Appendix A: *Standardized GPS Symbology for Planners)*
- Camera.
- Clinometer,
- Range finder-suggested
- 100' Measuring tape and/or String Box allows inventory to continue when GPS is unavailable.

Data collected from Office Sources: This data is collected from electronic, hardcopy sources and analysis tools, as well as Participant interviews.

Roads

Location of roads/trails should be documented on: aerial photos, orthophoto, topography map, planimetric map, or some other type of resource inventory map.

Categorized each individual road or trail as: Road (R) or Forest Trail (F) and
(show code on map or photo) Active (A-) or Inactive (IA-)

For Inactive roads/trails the planner may use DNR codes or other codes instead of IA:

WA DNR designated "Orphaned" (O)
WA DNR designated "Abandoned" (A)
Decommissioned but not designated by DNR (D)
Overgrown with vegetation and not used (OV)

(Use RMAP maps and other documents when available)

Example: On map or photo show code for active road as A-R or inactive Abandoned road as IA-A

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Define the ***purpose*** of road/trail system:

Access for forest management activities and product extraction,
Easement-access for other property and property owners
Access for development
Access for recreation
Other use or purpose (explain in notes).

What is the ***age*** of the road system? All infrastructure have an effective life span beyond which, upgrading is needed for continued use.

Does the Landowner know the ***management/maintenance history*** of road system? Knowing the history of a road system will give insight into the condition of the road and the amount of upgrading needed. A holistic and consistent management process can extend the effective life of a road system.

What is the ***traffic level and typical vehicle type*** on this road system? (Light, Moderate, Heavy). Traffic levels can help you determine the amount and type of maintenance needed and the interval in which it is needed. **Light** would be pickup truck traffic for personal(single family) use with less than 6 vehicle passes per day, weekend recreational use or weekly forest/livestock management activities. **Medium** would be one ton pickup trucks and larger for more intensive forest/livestock management activities and/or multiple users with daily pickup trucks or passenger vehicle traffic greater than an average 6-20 vehicle passes per day. **Heavy** would be larger industrial vehicles used in forest/livestock management activities and product extraction or greater than 20 vehicle (of any size) passes per day.

Is ***access controlled*** on this road system? (Yes; Sometimes; No). **Yes** would be gates or long term road closure structures and the road is closed for the entire wet season. **Sometimes** would be the road has unrestricted access seasonally and there is some limited access for specific reasons during the wet season. **No** means the road has unrestricted access year round.

Soils

Even with surfaced roads, the underlying soil affects the risk of erosion.
What ***kind of soils***? (See Soil Report: Map Unit Descriptions, Soils Property & Engineering Properties)
What is the on & off road ***soil erosion risk*** factor (see Soil Report: Hazard for Erosion and Suitability for Roads on Forestland and Haul Roads, Log Landings and Soil Rutting on Forest Land)
What is the ***Hydrologic connectivity***? (See Soil Report: Physical Properties)
Is it a ***Hydric soil*** or potentially a forested wetland? (See Soil Report: Hydric Soils)

Climate

Average ***annual precipitation*** (See O:Geodata\Climate\Precipitation-ArcGIS Layer):
2 year ***Storm Event***-24 hour and 100 year Storm Event-24 hour (See NOAA Atlas 2 or National Engineering Handbook Part 630, Chapter 7)

Road segments at and near intersections (crossings) with or that run parallel to and within 200' of water courses (streams, creeks, rivers…) and water bodies (lakes, ponds, wetlands…) usually have the highest risk of resource concerns.

Stream crossings and parallel roads

Location and type of water courses and water bodies should be documented on the same base map or photo as the roads/trails.

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Does the ***road cross a water course or water body***? First check the WA State IMSViewer for Water Typing- http://fortress.wa.gov/dnr/app1/fpars/viewer.htm to see if the water has been typed by the State. The State of Washington considers all typed waters to be public resources. Streams classified as "S", "F"or "Np" will qualify as perennial streams. "N", and "Ns" type streams are considered intermittent or seasonal streams. These same classifications will apply to wetlands. For streams that are typed as "U", and for streams that are un-typed use the USGS maps in ARC GIS and perform a participant interview to assist in determining whether the stream is perennial and intermittent. For determining fish usage of the U or untyped waters contact NRCS Area Biologist. For wetland determinations, contact the Area Resource Conservationist. For NRCS, wetlands are defined by the 1985 Food Security Act. (See Appendix E: Glossary for definition of types).

Is there a ***road that runs parallel to and within 200'*** of a water course(stream, river, creek…) or water body (wetland, lake, pond…)?

Does the **road system change the natural hydrology** of the site by pirating water from one draw to another, disrupting the connectiviety of wetland complexes, creating road impounded wetlands, draining wetlands…? Explain the situation.

Data Collected in the Field: Use GPS, Photos and/or video for documenting benchmark conditions. Focus your field inventory on the areas that you have determined to have the greatest risk of developing a resource concern. The best time to do a field inventory of roads/trails is when it is raining. You can see and document surface water concentrating and sediment delivery to streams and wetlands.

Confirm Soils Surface Texture in the Field

Is the **surface texture consistent** with the Soil Survey? Do basic soils field tests to confirm estimated surface texture of the soil: visual inspection, smell, feel, ribbon test…and so on. If engineering requires more detailed soil testing, contact Area Resource Conservationist for assistance.

Road Surface

Is the **road surface**: paved; gravel; native soil; etc.

What is the average **width** of the road segment? Measure up to three times: the start, in the middle and at the end.

Are there **indicators of water concentration** on the road surface? Use photos and/or videos for documenting benchmark conditions. Some of the indicators are ruts, berms, rills, gullies, potholes, and sinkholes. Provide the location of the indicators using GPS or just estimate the location on the resource inventory map.
See Appendix D for indicators of erosion.

Roads sides and shape

What is the **shape of the road sides**? Do the road sides slope away on both sides (like a road found on a ridge.); have cut slope and side cast (like a road found on a mid-slope.); is it incised (sometimes found on flats or floodplains); Even with the ground level (sometimes found on flats and floodplains)? Is the ***shape of the road prism*** in-sloped, out-sloped or crowned?

Seeps and springs

*Are **seeps or springs** present on the road, cutbank, sidecast, fil, ditches or directly adjacent to the road?*

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Ditches

Are the **ditches connected** to a typed water course (or wetland) or is it outlet on to a stable forest floor using a cross drain structure?

Signs of erosion within the ditch? See Appendix D for indicators of erosion.

Cross Drain Sturctures

Are there any ***cross drain structures*** within the road segment? If so, are the cross drain structures ***functioning*** properly? What ***type*** of cross drain structures are there? (relief culvert/ STD waterbar/ rolling dip/ rubber waterbar or some other) See Appendix B: *Culverts vs. Cross Drains*

What is the **distance** between ditch outlets or cross drains structures? You could use the field measured distance or an approximation such as: <100 ft; 100 to 500 ft; > 500 ft.

Stream(or wetland) crossings and parallel roads: Are there indicators of sediment delivery to the typed water? Provide photo or video documentation.

Stream(or wetland) Crossings

Confirm map information about water type, crossing grade and distances.

Is the crossing structure ***functioning properly***? Some indicators of improper function would be a pipe more than half full with high velocity to the water flow, the outlet of the pipe is perched (culvert does not follow the grade of the slope but outlets above the grade, plunge pool below the outlet (often caused by a perched culvert), undercutting or side cutting around the pipe, signs of water flowing over the road, debris build up at the inlet, and crushed or damaged pipe. Are any of the above indicators present? If so which ones? If you think the culvert could be a fish passage barrier, then contact your Area or State Biologist and Engineer for assistance.

What is the ***grade*** (slope) of the road segment sloping down towards the stream crossing? You could use the field measured grade or an approximation such as: ≤2%; 3-6%, 7-10%; >10%. Grade or slope of the road is a major factor in determining velocity of the surface water draining down the road to a stream crossing.

What is the ***length*** of road segment (horizontal) that is draining into the stream crossing? You could use a field measurement or an approximation using GPS points. Length of the road segment draining towards the stream crossing is another major factor in determining velocity of the surface water.

What is the average ***grade*** of the stream at the crossing site? Estimate the grade from the topographic map (< 2%; 2-4%, 4-16%; >16%) and confirm it in the field. Grade or slope of the stream is a major factor in determining the velocity of the stream, which along with the soil can indicate erosion risk. In addition the stream gradient affects the quality and type of fish habitat (see SVAP2).

Road/trail parallel and adjacent to stream (or wetland)

Confirm in the field, the average ***grade*** (slope) of the stream adjacent or parallel road segment? You may either document the average field measured grade or confirm the estimated grade category: (< 2%; 2-4%, 4-16%; >16%)

What is the ***length of the parallel road segment***? You could use a field measurement or an approximation using GPS points.

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Condition of the Buffer: Bare Ground; Mulched; partially vegetated; fully vegetated or some other covering like rip rap?

What is the ***average slope of the buffer?*** Use actual average field measurement. Take at least 3 shots to establish an average buffer slope.

What is the ***average distance from the road edge to bankfull width of the stream (buffer length)***? Also make note the minimum distance. You could document a average field measured distance or an estimation such as: <35; 35-100 ft; 100-200 ft; >200 ft. If providing an average field measured distance then take at least 3 measurements.

Washouts & landslides
Does the road have **side cast or fill**? If so, is water running through the side cast and/or fill or are their cracks in the road?

Are there any current **washouts or landslides**? If so, is the washout or landslide currently delivering sediment to typed water?

What is the cause of the landslide or washout? Washouts are usually caused by blocked culverts or cross drain structures and are often within our scope of treatment. Landslides are usually associated with specific unstable andforms and often not within the scope of our treatments or financially prohibitive.

Side cast road is a road who's surface is at least partially built on fill.

Operation and Maintenance The Site specific Engineering design specifications will have an O&M plan as part of the specifications. If standard engineering design specifications are used then the following will be the standard O&M plan:

Link to a O&M plan template is:

http://www.wa.nrcs.usda.gov/technical/ENG/o%2Dm%5Fplans/

Air Quality Impacts: Air quality issues associated with the roads/trails being inventoried, will be documented in the comment section of the field inventory sheet *"Inventory Data for Road/Trail Segments"*. Document impacts for the entire road system within the project area, not just the segment being inventoried. The analysis of the impacts will be done using AQ TN 1.

References:

NRCS Practice Standards:

- 560 Access Road
- 654 Road/Trail/Landing Closure and Treatment
- 655 Forest Trails and Landings

Associated Practices Standards:

- 314 Brush Management
- 315 Herbaceous Weed control

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- 342 Critical Area Planting
- 370 Atmospheric Resource Quality Mangagement
- 373 Dust Control on Unpaved Roads and Surfaces
- 391 Riparian Forest Buffer
- 395 Stream Habitat Improvement
- 396 Fish Passage
- 472 Access Control
- 484 Mulching
- 490 Tree/Site Preparation
- 578 Stream Crossing.
- 582 Open Channel
- 584 Channel Stabilization
- 587 Structure for Water Control

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Barkley, Yvonne C., **Best Management Practices for Forest Roads in Idaho,** University of Idaho Extension, Woodland Notes, Spring/Summer, 2007, Vol. 18, No. 2

Brannon, Baumgartner, and Hanley, **Roads on Small Acreage Forests in Washington,** July 2001**,** WSU Cooperative Extension, EB1910,

Copstead, Johansen and Moll, **Water/Road Interaction: Introduction to Surface Cross Drains.** September 1998, USDA/USFS Report 9877-1806 SDTDC.

Grace, Johnny M. III, **Determining the Range of Acceptable Forest Road Erosion,** June 2008. USDA Forest Service, Auburn Alabama. ASABE Meeting Presentation

Jones, Swanson, Wemple and Snyder, **Effects of Roads on Hydrology, Geomorphology and disturbance Patches in Stream Networks**, Feb. 2000, Conservation Biology, Vol. 14, No. 1.

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NRCS National Planning Procedures Handbook

Oregon Department of Forestry, **Forest Road Management Guidebook,** Jan. 2000

OSU Extension Service & Oregon State University, **Managing Woodland Roads,** Nov. 2007. Lane Co. Oregon.

Reid, Dunne, and Cederholm, **Application of Sediment Budget Studies to the Evaluation of Logging Road Impact,** Dept. Geological Sciences and Fisheries Research Institute, Univ. of WA, Seattle Washington.

Reid and Dunne, **Sediment Production From Forest Road Surfaces,** Nov. 1984, Water Resources Research, Vol. 20, No. 11, Pages 1753-1761.

Switalski, Bissonette, DeLuca, Luce, and Madej, **Benefits and impacts of road removal,** 2004, Frontiers in Ecology 2(1):21-28.

WA DNR, **Forest Practices Illustrated**, 2009 Update.
Washington Administrative Code: WAC 222-24-050, 051, 0511, 052
Revised Code of Washington: RCW 76.09.***,
Washington Forest Practices Board Manual: Section 3

WF&CA Workshop, **Forest Road Drainage: From Fundamentals to Watershed Impacts,** April 2010**,** Springfield Oregon.

USDA Soil Conservation Service, **Guide to Building Small Roads,** Jan. 1983, Davis California

Appendix A

Standardized GPS Symbology for Planners:

Always add a number or descriptor to the symbol. You might want to use an E for existing or a P for planned if you will be showing both on the same map. The # should be replaced by a sequential number.

BR#	Bridge. You can either give the position a number like BR1, BR2 … or you can describe the Bridge like BR70. Where the 70 is the length of the bridge in feet.
CG#	Cattle Guard.
CRST#	Crest of road. Where road slopes away from the stream crossing or segment that is adjacent and parallel to the stream.
CU#	Culvert. You can either give the position a number like CU1, CU2 … or you can describe the Culvert like BR18. Where the 18 is the diameter of the culvert in inches.
END	End of Road or End of Trail
FORD#	Rolling Dip or Ford.
GB#	Where the slope of the road changes significantly. You can either give the position a number like GB1, GB2 … or you can describe the change like GB10-15. Where the slope in the road changed from 10% to 15%.
JCT#	Road or trail junction.
SP#	Sag Point. Where slope reduces and water on road pools and sediment falls out of suspension.
SCR#	Scour is erosion. Where water concentrates and causes rill or gully erosion, widening or incising of ditch, or removal of soil around crossing structure.
SH#	Sink Hole. A pot hole is on the surface of the road. A sink hole is the undermining of the surface and subsurface layers of the road due to the flow of water through the fill.
SLD#	Slide. Displacement and movement of a significant amount of soil due to saturation and perhaps weight and angle (moves alot).
SLMP#	Slump. Includes cracking in road surface, side cast or fill. Sinking of the road surface, side cast or fill (moves a little).
SPRG#	Spring or Seep.
STRM	Perennial Stream
STRMINT	Intermittent Stream
TA#	Turnaround
WB#	Waterbar
WT	Wetland

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Appendix B

Culverts Vs. Cross Drains

United States Department of Agriculture

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September 1, 2010

To: Western Washington NRCS Employees

Subject: Culvert vs. Cross Drains (Relief Culverts) on Road Systems
Western Washington NRCS Guidance

From: Western Washington Engineering Staff

The National Access Road practice standard was updated in July 2010. One of the updates is how cross drains shall be referenced. From here on the terms cross drain and relief culvert can be used interchangeable.
The Access Road (PS 560) payment scenario has been updated for the 2011 contracting season. The payment scenario now allows for a separate payment of necessary cross drains (relief culverts). If the culvert does not meet the definition of cross drain (relief culvert) it should be contracted under PS 560 culvert.
A person JAA should visit the site during the contracting phase. For road systems where pipe will be installed, either as a cross drain (relief culvert) or stream crossing, the person doing the planning, design or inspection shall have job approval authority for the appropriate culvert diameter. All pipes that transfer water shall be considered culvert pipes for job classification purposes. This is in addition to approval authority for the road based on surfacing material to address the erosion control work.

Cross drain (Relief Culvert) – Drainage structure conduit used to carry road and ditch water from one side of the road to the other where it can be dispersed onto the forest floor. This structure is meant to be a drainage relief structure. This would apply to sites where water from the upper road section is collected using a roadside ditch or road grading. This would also include water intercepted or diverted by a road side ditch coming from seeps, springs and surface runoff flowing from hillsides. The cross drain would be installed to transfer that water across the road to a stable location away from waters of the state.

Culvert– Stream or Water Crossing conduit to be used at a natural stream (water) crossing. A stream (water) crossing is defined as having a defined bed and bank and can be perennial or intermittent in nature. Other sites that are candidates for the culvert scenario are sites with their own drainage areas, receive extensive uphill drainage or receive water from a seep area. Culverts that are a fish passage barrier require additional consideration and design. Culverts that are on Type N Waters require a consideration for the passage of debris to prevent plugging.

References for access road cross drains (relief culverts) and culverts:

- PS 560 Access Road
- Dean Renner's guidance document "Design of Road Crossings for Fish Passage"
- Washington State Forest Practices Illustrated
- WADNR Board Manual Section 6.3 "Water Crossing Structure in Type N Waters"
- Managing Woodland Roads: A Field Handbook
- WA NRCS Engineering Tech Note 10: Forest Road Contracting, Construction, and Maintenance for Small Forest Woodland Owners"

The Natural Resources Conservation Service provides leadership in a partnership effort to help people conserve, maintain, and improve our natural resources and environment.

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Appendix C

Forest Roads/Trails Inventory Worksheets

From GIS and Participant Interview
Inventory Data for Entire Road/Trail System

Field Inventory worksheets
Especially when using GPS Equipment
Inventory Data for Road/Trail Segments

After Inventory
Analysis of Benchmark Conditions and Practice Proposal
Evaluation of Proposed Practices

Other Acceptable Worksheets
Especially when using a string box (Hip chain) or Tape (100' or 200')
Road/Trail Inventory Log

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WA NRCS Road Inventory-Cover Form 2014 Forestry TN : XX

Inventory Data for Entire Road/Trail System

Participant Nan	Inventory Date:
Location:	
Farm/Tract #:	Fields:
Inventory performed by:	

Road/Trail

Circle all that apply

Location of road/trail system documented on:	Aerial Photos	Ortho-photos	Topograph y Map	Planimetric Map
	Other:			

Categorize road (R) /trail (T) system-Approx FT:
(Provide approx. FT or show code on the photo or map)

Active (A-)= or)=
WA DNR designated "Orphaned" (O)=
WA DNR designated "Abandoned" (A)=
Decommissioned but not designated by WA DNR (D)=
Overgrown with vegetation and not used (OV)=

Using WA DNR Typing--Categorize Water courses and bodies: S, F, N, Np, Ns, U (Show on map or photo)

Purpose of road/trail system:
(check all that apply)

- [ ] Access for Forest Management activities and forest product extraction
- [ ] Easement- access for other property owners.
- [ ] Access for development or current driveway
- [ ] Access for recreation
- [ ] Other:_____

What is the age of the road system?	Years:		
What is the traffic level on the road system?	Light	Moderate	Heavy
Is access controlled on this road system?	Yes	Sometimes	No

Soil

What Kind of Soil? _____
What is the "On & Off Road Soil Erosion Risk Factors"? _____
What is the infiltration rate? _____

Climate

What is the Average Annual Precipitation for the project area? _____
What is the 2 yr, 24 hr storm event for the project area? _____
What is the 100 yr, 24 hr storm event for the project area? _____

Road crossing water courses and bodies or roads parallel to water courses and bodies.

Does the road system cross water courses/bodies?	Yes- How Many:	No
Document these crossings on a map or photo?	Ref Map/photo:	
Document the WA DNR Type for each water course/body associated with the crossings?	Ref Map:	
Are there roads that run parallel to the water courses/bodies?	Yes-How many:	No
Document the road segment and water course/bodies affected?	Ref Map/photo:	
Are there areas where the road system is disrupting the natural hydrology of the land?	Yes	No
Document the road segment and water course/bodies affected?	Ref Map/photo:	

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WA NRCS Road Inventory Form 2014 Forestry Technical Note XX

Inventory Data for Road/Trail segments

Participant		Farm/Tract	
Location:			
Inventory Preformed By		Date	

Road/Trail Segment # or GPS Code		Soil:	Road surface	Road/Trail (+ ditches or			Road /Trail surface:						
							concentrated water:						
Start	End	code or surface texture	Native, Gravel, Paved	Ave Road Width	convex, concave, flat, cut and	vegetated (V) or bare	rutted	berms	sheet	rills	Ephemeral or Classic gullies	pothole and/or Sinkhole	Spring or seeps

Road/Trail Segment # or GPS Code		Ditches:			Spring or seeps:		Cross drain structures:			Does road cross a water course or	WA DNR Water Type: S, F, Np, Ns, N, Ukn	road sloping down to crossing structure	
Start	End	clean and functional	eroding	connected to water course	On cut	On Fill	Type I culvert w/bar.	No.	# Functional			Length (FT)	Grade (%)

Road/Trail Segment # or GPS Code		Grade of stream at crossing ? <5%, 5-10%,	Crossing structure		If Not Functioning properly give reason or type of damage		Road adjacent & parallel to a water course or body				Is this a side cast or partially side cast	Other Issues or comments
Start	End		Type Bridge Culvert, Ford	Function properly?	Inlet	Outlet	(FT) Length of	(%) Grade of rd	(FT) Buffer width	(%) Slope of buffer		

Comments:

* or checkmark means the same. No or blank means the same.

WA NRCS Road Analysis Form 2014

Forestry TN: XX

Analysis of Benchmark Conditions and Practice Proposal

Participant Name: _____ Analysis Date: _____

Location: _____

Farm/Tract #: _____ Fields: _____

Analysis performed by: _____

Resource Concerns by Road Segment

Road Segment Start/End Point	Soil Erosion		Excess Water	Insuff. Water	Degrade Water Quality	Air Quality Impacts	Inadequate Habitat for Fish & Wildlife	Degraded Plant Condition	
	Sheet, rill and wind	Concentrated flow	Ponding, flooding, High WT seeps, snow	Ineff. Moist Mgt	Excess sediment in surface water	Emission of PM	Habitat degradation	Plant Prod. and health	Excess Plant Pest Pressure

Proposed Treatment (Practice/Component) By Road Segment

Road Segment Start/End Point	Treatments, Practice Code, Component and comments

Participant signatures will occur on site specific engineering design specifications or standard engineering design specification.

Comments:

WA NRCS Road Analysis Form 2014 Forestry TN: XX

Evaluation of Proposed Practices

Participant Name: _____ Evaluation Date: _____

Location: _____

Form/Tract #: _____ Fields: _____

Evaluation performed by _____

Evaluation of each treatment (Practice/Component)

Practice code-Road Segment (Start/End)	Conservation Practice Physical Effects by Practice and adjusted for Component								
	Soil Erosion		Excess Water	Insuff. Water	Degrade Water Quality	Air Quality Impacts	Inadequate Habitat for Fish & Wildlife	Degraded Plant Condition	
	Sheet, rill and wind	Concentrated flow	Ponding, flooding, High W.T. seeps, snow	Ineff. Moist. Mgt	Excess sediment in surface water	Emission of PM	Habitat degradation	Undesir. Plant Prod. and	Excess Plant Pest Pressure

Implementation checkout or "As Builts" and evaluator signatures will be done on site specific engineering design specifications or standard engineering design specifications

Comments:

Road/Trail Inventory Log

Client:			**Farm/Tract:**	**Date:**
Location:			Technician:	
Road	**Station**	**To Station**	**Description of Benchmark Condition or Proposed Treatment**	

Appendix D

Indicator of erosion

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Appendix E
Glossary

Berm: earthen embankment or ledge found at the edges of roads, which holds and concentrates water on the road surface instead of allowing the surface water to shed off the road in a dispersed sheet.

Gully: Channels caused by convergence of surface water runoff that degrades soil quality and tends to increase in size.

Rills: Convergence of surface water which can cause the detachment and transport of soil particles.

Ruts: Depression in the ground made by wheels.

Water bodies: Wetlands, lakes, ponds, bogs, and sloughs,

Water Courses: Rivers, streams, and creeks.

Washington DNR Water Types:
S: Shorelines of the State of Washington under chapter 90.58 RCW. Larger named rivers and streams.
F: Streams, Lakes and ponds that are used by fish, amphibians, wildlife and/or drinking water.
Np: These flow year round either on the surface of the stream bed or sometimes below the surface for some distance. Perennial nonfish habitat streams that do not go dry during any time of a year of normal rainfall.
Ns: These do not flow year round, but do connect to a Type S, F or Np stream. Seasonal, nonfish habitat streams in shich surface flow is not present for at least some portion of the year.
N: Nonfish habitat stream that needs field verification of being either perennial or seasonal.
U: Water type is unknown. Field verification needed.

Wetland: For this document, Wetlands is defined by the Food Security Act of 1985 (Part 527).

Wetland is defined as land that;

1. Has a predominance of hydric soils and
2. Is inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal circumstances, does support, a prevalence of hydrophytic vegetation typically adapted for life in saturated soil conditions.

Wetlands are identified through the confirmation of wetland criteria. All three wetland criteria, hydric soils, hydrophytic vegetation, and wetland hydrology, normally must be met for an area to be identified as wetland.

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