OREGON DEPARTMENT OF FORESTRY

Forest Practices Compliance Audit: 2016 Annual Report

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Acknowledgements

Private landowners and Oregon Department of Forestry (ODF) field staff helped design and implement this project. ODF thanks those private forest landowners that graciously gave us permission to use their timber harvest sites for this survey. The Compliance Audit is an entirely voluntary program and would not be possible without their cooperation.

The external review committee continues to provide valuable input. The authors thank all the ODF stewardship foresters who on a daily basis keep the goals and objectives of the Forest Practices Act in the forefront of their delivery of services to forest landowners, operators and the citizens of Oregon.

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COMMITTEES AND COORDINATORS

This study has periodic oversight by an external review committee. The committee's main functions were to review and provide feedback on the study design, field protocols and reports. This input was utilized by the Oregon Department of Forestry (ODF) in carrying out the study and completing the report. The committee met throughout the development of the project, and will continue to meet as needed.
Additionally, study design received input from department field staff, and the study coordinating group has conversed with field staff on an ad hoc basis throughout the project.

External Review Committee

The following stakeholder groups were represented on the External Review Committee:

Oregon Department of Forestry – State Forests Program

Stimson Lumber Company

Oregon Small Woodlands Association

Oregon Forest Industries Council

Olympic Resource Management

Weyerhaeuser Company

International Paper

Collins Pine

Oregon Department of Environmental Quality

Associated Oregon Loggers

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COMPLIANCE AUDIT REPORT: 2016

EXECUTIVE SUMMARY

In 2011, the Oregon Legislature directed the Oregon Department of Forestry (ODF) to conduct an audit of timber harvest practices regulated under the Oregon Forest Practices Act (FPA) and to use a private contractor. An initial audit of 200 sites was completed in December 2013; overall compliance was 96%. Again in 2014 and 2016 ODF employed a private contractor to collect data according to same protocols, on 100 sites. This report contains the 2016 results.

The compliance audit focuses on harvest and road rules, and a subset of the water protection rules. Contractors collected data at sites harvested between 2012 and 2014, and provided ODF with these data, photographs, and notes. ODF used database and Geographic Information System (GIS) software to analyze the data and assess compliance based on pre-set decision criteria. Analysis focused on implementation of FPA rules and potential or actual impacts to resources. Without a full enforcement investigation and legal decision on compliance, outcomes are apparent rates of compliance or non-compliance, although for readability the word "apparent" is not used but implied.

The study stratified harvest sites by FPA administrative areas (Eastern Oregon Area, Northwest Oregon Area, and Southern Oregon Area) and by ownership classes (Private Industrial, Private Non-industrial, and Other). The Other class represented governmental entities, including state and county forests.

The 2016 study revealed a 97% compliance rate when analyzed at the rule-level (Table ES1).

The highest compliance rates were with Division 625 (Road Construction and Maintenance; 98%), Division 640 (Water Protection Rules: Vegetation Retention along Streams; 99%) and Division 660 (Water Protection Rules: Specific Rules for Operations near Waters of the State; 99%).

The compliance rate for Division 655 (Water Protection Rules: Protection Measures for "Other Wetlands, Seeps and Springs) improved from 72% in 2013 to 98% in 2016.

The findings of the 2013 and 2014 studies are in use as topics for training efforts by agency and industry alike. Third party certification systems also use the findings in their process. Rates of compliance with the FPA rules are also a legislative key performance measure (KPM) for ODF.

Table ES1. Compliance rates for Areas and Ownership Class.

Compliance Rate	
Overall	**97%**
FPA Area	
Eastern Oregon Area	96%
Northwest Oregon Area	98%
Southern Oregon Area	97%
Ownership Class	
Private Industrial	98%
Private Non-industrial	96%
Other	97%

Compliance rates greater than 95% were found with all rule divisions tested. The lowest compliance rates at a Division level (92%) were found with rules involving Written Plan requirements, primarily on lands of Private, Non-Industrial ownerships.

Table ES2. Compliance rate for rule divisions.

Rule Division		Compliance Rate
Several	Written plans	92%
625	Road Construction and Maintenance	98%
630	Harvesting	96%
640	Vegetation Retention Along Streams	99%
655	Protection for “Other Wetlands”	98%
660	Operations Near Waters of the State	99%

INTRODUCTION

ODF regulates forestry operations on non-federal forest land by means of the FPA. Landowners and operators are subject to the FPA Rules when they conduct any commercial activity related to the growing or harvesting of trees. The purpose of the FPA is to:

> [E]ncourage economically efficient forest practices that assure the continuous growing and harvesting of forest tree species and the maintenance of forestland for such purposes as the leading use on privately owned land, consistent with sound management of soil, air, water, fish and wildlife resources and scenic resources within visually sensitive corridors as provided by ORS 527.755 that assures the continuous benefits of those resources for future generations of Oregonians. (ORS 527.630 Policy, Oregon Forest Practices Act)

FPA rules were developed to achieve the objective of FPA statutes, and are contained in Oregon Administrative Rules Chapter 629. The ODF Private Forests Program administers FOA rules, and monitors their implementation. The findings of the 2013 and 2014 compliance monitoring efforts (ODF 2013, 2014) are in use as topics for training efforts by agency and industry alike. Third party certification systems also use these findings in their process. Rates of compliance with the FPA rules are also a KPM for ODF.

History of Compliance Monitoring

Between 1998 and 2000, the ODF Forest Practices Monitoring Program implemented the Best Management Practice Compliance Monitoring Project (BMPCMP). The project was designed to identify the level of forest operations in compliance with FPA rules. Statistical rigor was a feature of the study, which was conducted by ODF employees. Results were summarized in a 2002 report (ODF, 2002).

In 2011, the Oregon Legislature directed ODF to audit rates of compliance with FPA rules[1]. In contrast with the BMPCMP study, the legislature stipulated that this work was to be conducted by contractors. ODF designed the program to have contractors responsible for collecting field data, but ODF retained responsibility for

[1] 2011 Legislative Session-Budget Note #1

interpreting field data and estimating compliance rates. Results from the first year efforts were summarized in the 2013 Compliance Audit Report (ODF, 2013).

Continuity in Sampling and Analysis 2013 -2016

In the 2016 study, ODF used the same contractor, and criteria for data collection as in the 2013 and 2014 studies. Rule compliance was assessed by ODF staff using the same methods as in the 2013 and 2014 efforts after the data were collected and submitted by the contractor.

The study design was prepared to answer the following monitoring questions at a broad spatial scale:

1. How often did operators comply with the FPA rules pertaining to harvesting, road construction and maintenance, and water protection?
2. How does compliance vary by FPA administrative area ("Area") and landowner type?
3. Which rules have relatively high and low compliance rates?
4. What is the scale of resource impacts resulting from non-compliance?
5. In what practices, if any, do landowners, operators and ODF staff need more training and education to reduce resource impacts?

The study was also intended to answer rule-specific questions regarding implementation of FPA rules that seek to avoid or eliminate:

- Ongoing or imminent delivery of sediment or organic debris to waters of the state. This was the criterion used in most rules to assess compliance.
- Logging debris and petroleum products in waters of the state.
- Petroleum products left in the forest.
- Stream channel disturbance.
- Loss of shade or other riparian functions.
- Disrupted hydrology.

Sample Site Selection - 2016

In 2016 the contractors collected data at 100 sites spread across all three Areas (Figure 1). The number of sites chosen from each Area were proportional to the total acreage for which notifications were received during the sample interval (Unit end dates January 1, 2013 to November 5, 2014). The process resulted in 46% of units being chosen in the Northwest Oregon Area; 35% of units were chosen in the Southern Oregon Area; 19% of units were chosen from the Eastern Oregon Area (Table 1).

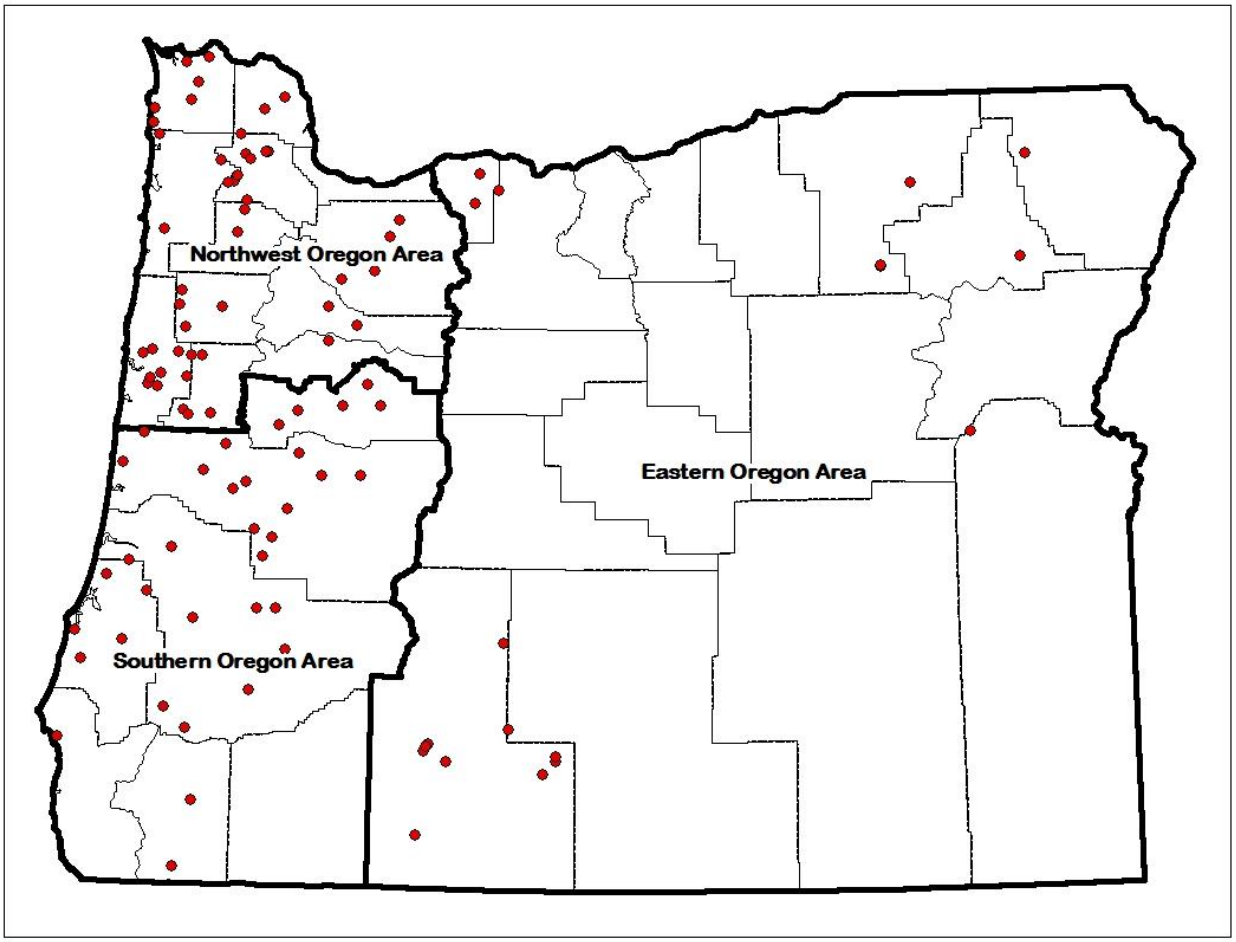

Figure 1. Locations of units surveyed for Oregon Department of Forestry 2016 Forest Practices Act compliance audit.

Ownership of sample sites was classified into three groups[2]:

1. Private Industrial (PI): private entities owning greater than 5,000 acres of land;
2. Private Nonindustrial (PNI): private entities owning less than 5,000 acres of land; and
3. Other (OTH): generally public entities such as state and county forests.

Note that federal and tribal ownerships are not covered by the FPA, and thus are not included in this study. The number of sites chosen from each Area was also stratified by ownership class as shown in Table 1.

Table 1. Units surveyed by Area and ownership class. PI – private industrial, PNI – private non-industrial, Other – public entities such as state or county.

Area	Total units	Landowner Class		
		PI	PNI	Other
Eastern Oregon	**19**	9	9	1
Northwest Oregon	**46**	32	12	2
Southern Oregon	**35**	18	13	4
Total	**100**	**59**	**34**	**7**

Notification numbers (i.e., an ODF-generated number identifying a forest operation) were randomly chosen from the Department's Forest Activities Notification System (FACTS) database for each Area and ownership class, stratified as previously mentioned. Landowners were then contacted by telephone and electronic mail for permission to access the site.

Sites were deemed unsuitable if harvest did not occur or was presently underway, or other reasons, based on input from landowners and ODF field staff. Other reasons included non-commercial harvests, ownership changes, and conversions to other land uses. There were 220 suitable sites in an initial draw of 418 (Table 2).

[2] Note that when landowners notify for harvest, they self-select into the categories as per these criteria.

Table 2. Suitability for study of 418 sites selected at random from FACTS database.

		Suitable		Unsuitable			Unknown
Ownership	**Inquiries**	**Permission Granted**	**Permission Refused**	**Did Not Operate**	**Active Harvest**	**Other**	**No Response**
PI	180	135 (75%)	3 (2%)	6 (3%)	5 (3%)	3(2%)	28 (16%)
PNI	204	38 (19%)	19 (9%)	19 (9%)	10 (5%)	34 (17%)	84 (41%)
Other	34	24 (71%)	1 (3%)	1 (3%)	3 (9%)	1 (3%)	4 (12%)
Total	418	197 (47%)	23 (6%)	26 (6%)	18 (4%)	38 (9%)	116 (28%)

Twenty-eight percent (28%) of landowners did not respond to our request, primarily from the Private Non-Industrial and Other ownership classes (Table 2). Six percent (6%) of landowners refused to participate. Landowners who did respond, and whose lands were suitable, granted permission in 47% of the queries. Permission was sought on 204 Private Non-Industrial sites to get 38 sites for study, and thus a rate 19% of requested permissions were suitable and permission granted.

When a site was found to be unsuitable, or landowner permission could not be obtained, replacement sites were chosen using the random process described previously. We do not have data as to whether or not there would be a difference in compliance results if the sites for which we did not obtain permission were included in the analysis (i.e., is there bias in the data due to our method for determining which sites are selected?)

Data Collection

The use of contractors for fieldwork affected project design. ODF selected a subset of quantifiable FPA rules for evaluation, and then designed a field protocol that emphasized quantitative measurements and identification of specific conditions. This protocol was used by contractors to collect the field data (see Appendix I – "Field Guide"). The contractors submitted these raw data to ODF. Department personnel applied a quality control check to the data (See Appendix I, Section 6, page 52). Once data quality met agency standards, ODF used database and GIS software to analyze the data to assess compliance rates. The software performed logical queries to determine the number of locations (e.g., landings, stream segments, road segments) at which rules applied, at which rules were met, and whether resource impact (sediment into streams, primarily) occurred or was likely

to occur. Metrics identified in ODF guidance for administration of FPA rules are the predominant measure of compliance or non-compliance for the purpose of the study.

A list of the assumptions used in determining apparent noncompliance and applicable rule applications is given in Appendix III. Without a full enforcement investigation and legal decision on compliance, outcomes are apparent rates of compliance or non-compliance, although for readability the word "apparent" is not used but implied.

Once the list of applications of rules and associated noncompliant sample points was determined, compliance rates were summarized by total number of applications and by unit. Compliance rates were calculated based on the total number of potential rule applications for a given stratification (e.g., by Area, ownership class).

RESULTS

Compliance by Area, Ownership Type & Rule Division

State-wide compliance rates by Area are given in Table 4. Rules in this case were pooled together, with the total number of noncompliant applications over all sites and rules being divided by the number of total number of rule applications. On this basis, compliance is 97%. This year, rule level compliance is highest in the Northwest Oregon Area (NWOA; 98%), yet the lowest compliance level, for Eastern Oregon and Southern Oregon Areas, is still above 96%.

Table 3. Rule level compliance based on pooled data (total number of times a rule applied).

Rule Applications			
	Non Compliance	Applicable	Compliance Rate
Overall	**675**	**25,611**	**97%**
Eastern Oregon Area	195	5,012	96%
Northwest Oregon Area	257	14,169	98%
Southern Oregon Area	223	6,430	97%

Compliance rates are broken down by ownership class in Table 5. Aggregate rule level compliance is highest for the Private Industrial ownership class. Compliance with individual rules varied between ownership classes. Sample size for certain individual rule applications may bear on comparisons between ownership classes.

Table 4. Rule level compliance by ownership class.

Rule Applications			
	Non Compliance	**Applicable**	**Compliance Rate**
Overall	**675**	**25,611**	**97%**
Private Industrial	384	17,354	98%
Private Nonindustrial	219	5,774	96%
Other	72	2,483	97%

Table 5 shows compliance totals broken down by rule division (note: Division 605 is assessed separately in the section devoted to written plan rules and administrative compliance). Compliance rates are generally high for all rule divisions. Results for individual rules assessed in this study are listed in Appendix III. Sample size (n) equaled or exceeded 50 sample points for all of the individual rules discussed in the following paragraphs, except as noted.

Table 5. Compliance by rule division[3].

		Number of Rule Applications		
Rule Division	**Description**	**Noncompliance**	**Total**	**Compliance Rate**
625	Road Construction and Maintenance	234	11,369	98%
630	Harvesting	403	10,607	96%
640	Vegetation Retention Along Streams	5	562	99%
655	Protection for "Other Wetlands"	1	50	98%
660	Operations Near Waters of the State	29	2,986	99%

Rules in Division 625, Road Construction and Maintenance, had a compliance rate of 98% (Appendix III). Rule subsection 500 dealing with rock pits had perfect compliance for the eleven quarries sampled. Of the 9 rules dealing with road drainage, 8 exceeded 98% compliance. The exception was OAR 629-625-330(4),

[3] There was also one application of Rule Division 645, dealing with significant wetlands. No compliance issues were found.

where road segments near stream crossings were found to have adequate filtration structures in 83% of the rule applications.

Drainage structures were often less functional than the 98% statistic implies. Gullies were found on 18% of road segments and 27% of drainage culverts were partially or completely blocked. Note that only those road segments and culverts that drained to streams were considered in the compliance rates.

The lowest compliance within Division 625 involved the rules dealing with stream crossing construction and the removal of temporary stream crossings on roads. The lowest compliance involved the removal of temporary stream crossings on roads (0%, n=9; OAR 629-625-0430(5)) and the construction of sediment barriers (2%; OAR 629-630-0800(6)). Seventy-three percent of culverts were adequately sized to pass the 50-year peak flow (OAR 629-625-0320(2)(a)). A compliance rate of 75% was measured for (OAR 629-625-0310(2)), the rule dealing with end hauling of waste material.

Rules in Division 630, Harvesting, had a compliance rate of 96%. Complete compliance was found for rules dealing with keeping waste metal out of waters of the state (OAR 629-630-0400(4)). There was little evidence that skid trails on steep slopes were contributing sediment to streams based on compliance for the applicable rules (OAR 629-630-0150(7) and (8), 100% compliance on each rule).

Like roads, the lowest compliance for skid trails involved temporary crossings. Rules dealing with construction of sediment barriers at these crossings (2%; OAR 629-630-0800(6)); design to minimize sedimentation (76%; OAR 629-630-0800(4)(a)), and crossing removal (88%; OAR 629-630-0800(4)(e)) all exhibited compliance rates well below the average for rule Divisions.

Rules in Division 640, Vegetation Retention along Streams had a compliance rate of 99%. The only instances of noncompliance with this division were observed for retention of trees within 20 feet of Type F streams (OAR 629-640-0100(2)(b)).

Rules in Division 655, Protection for Other Wetlands had a compliance rate of 98%. This was higher than was observed in prior years. This may point to increased awareness of the presence of these small wetlands.

Rules in Division 660, Operations near Waters of the State had a compliance rate of 99%, and the sample size is large. Whereas there were 29 sample points of small N streams that had been relocated or had soil material added or removed (OAR 629-660-

040(1 and 2)), these points were less than 0.1% of all surveyed stream segments (cumulative n=2986 for the two rules).

Unit-level Compliance

Compliance rates were summarized for each of the surveyed harvest units. Unit compliance rates were calculated as the total number of times a unit complied with the rules divided by the total number of rule applications. Figure 2 shows the number of units that had a given compliance level. For example, 46 of 100 units ranged from 99-100% compliance.

Compliance rates for individual units ranged from 75%-100%, averaged 97.5%, and had a median compliance rate of 98.8%. Sixty percent of units complied with all applicable rules in at least 99% of sample points.

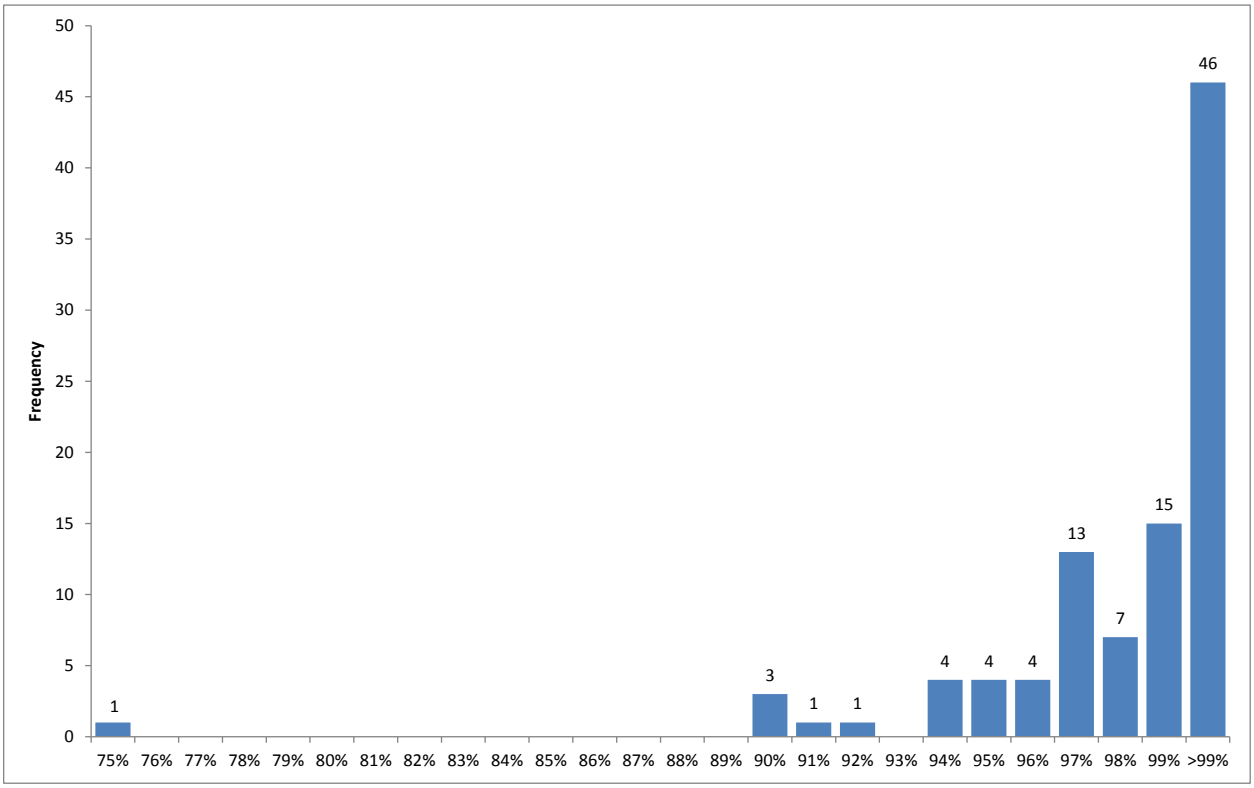

Figure 2. Frequency distribution of unit compliance rates

Scale of Estimated Resource Impacts

Contractors provided visual estimates of the amount of actual or potential sediment delivery at or to streams. Of the 139 recorded sample points where sediment was contributed, or potentially contributed, to waters of the state, 55% involved less than 1 cubic yard of sediment (Figure 3). These frequently involved trace amounts of sediment found in direct conveyance to, and within 10 feet of, streams. The five

sample points exceeding 10 cubic yards of sediment delivery were associated with roads. In three of these cases, sediment contribution exceeded 100 cubic yards and was associated with erosion below ditch culverts. These cases resulted twice in sediment contribution to small N streams, and once to a medium F stream. Note that RPA rules regarding stabilization of road fills, road cross drainage, and road surface maintenance mandate practices that would prevent the conditions observed at these three sites.

Sediment delivery was unevenly distributed among harvest operations. Two harvest units accounted for all five cases of sediment delivery exceeding 10 cubic yards, all of which were associated with roads. Thirty units delivered smaller amounts of sediment. The remaining 44 units that contained waters of the state did not deliver sediment to those waters, and 24 units had no waters of the state.

The bulk of this sediment delivery was to small water bodies. In 71% of these cases, sediment was delivered to Small Type N streams. Small and Medium F streams were responsible for another 25%. Delivery to wetlands <8 acres, Medium N streams, and Large F streams accounted for the remaining 4%.

The cases of sediment delivery noted in Figure 3 were associated with noncompliance with a variety of rules and a wide range of compliance rates (2-99%).

This indicates that even rules with high compliance rates can be associated with instances of significant sediment delivery.

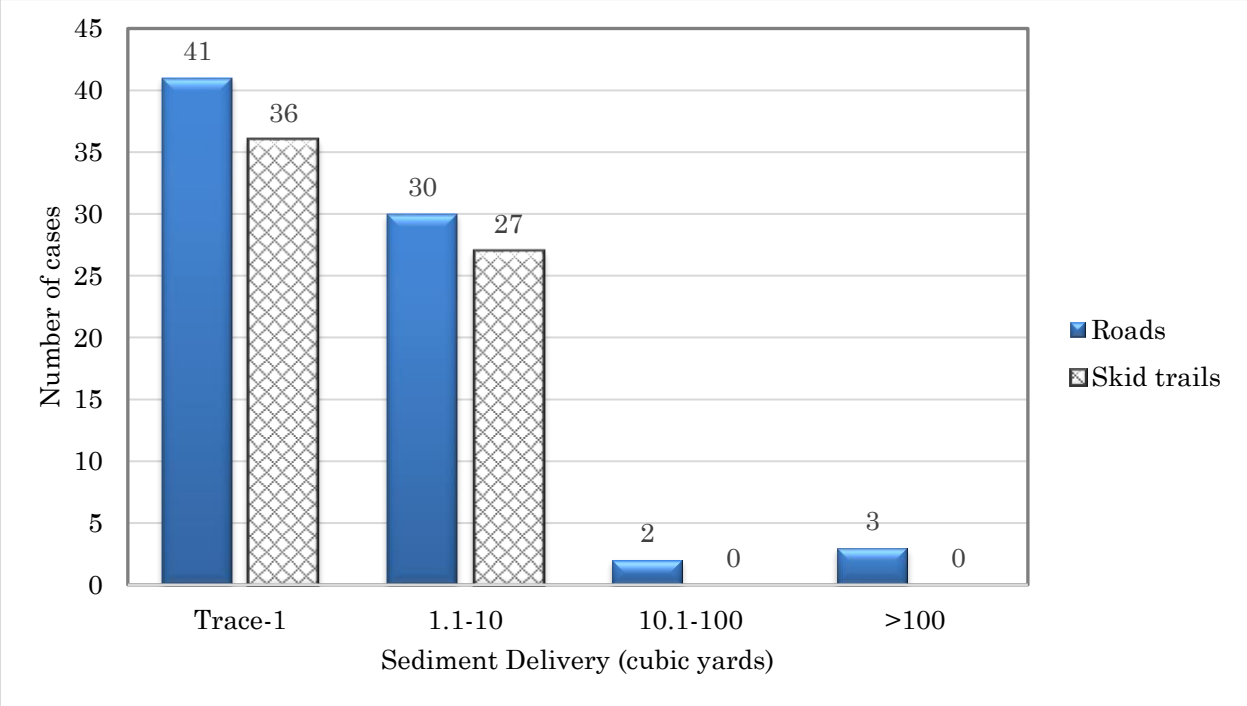

Figure 3. Number of cases of sediment delivery to waters of the state by bin of sediment volume and source of sediment (roads or skid trails).

Like sediment delivery, impacts from organic material in streams were concentrated in smaller water bodies. One hundred six of the 113 compliance issues related to slash in or near waters of the state occurred on Small Type N streams. Many of these streams were seasonal and steep. Wetlands less than 8 acres were responsible for another four slash events. On three occasions slash was observed in a fish-bearing body of water.

Grease tubes and other petroleum containers were found on 16% of landings. Operators are required to remove all petroleum product related waste material associated with the operation by an FPA rule (OAR 629-630-0400(3)).

Comparison with previous Results

In 2016, compliance rates for most rule divisions have increased from prior years (Table 6). Road construction and maintenance rules (Div. 625) again had compliance rates over 95%. Road drainage rules exceeded 98% compliance. The lowest compliance rates in all years were observed for rules related to drainage barriers at temporary stream crossings and skid trail crossings.

In 2016, the recorded effects of temporary stream crossings upon waters of the state, while still a problem, have improved from prior years (44% (2013), 48% (2014), and 76% (2016)).

Table 6. Compliance rate for rule divisions, 2013-2016.

Rule Division		2013	2014	2016
Several	Written plans	75%	83%	92%
625	Road Construction and Maintenance	97%	98%	98%
630	Harvesting	95%	93%	96%
640	Vegetation Retention Along Streams	98%	99%	99%
655	Protection for "Other Wetlands"	72%	83%	98%
660	Operations Near Waters of the State	99%	98%	99%

Overall Division level compliance rates for harvesting rules (Div. 630) in 2016 were 96%. This represented a slight improvement over both prior years.

Again, we found compliance rates of 98-99% with the vegetation retention rules (Division 640 and Division 660) governing operations near the waters of the state.

Compliance with the rules involving the protection of Other Wetlands (Division 655) increased over prior years, from 75% in 2013, to 83% in 2014, to 92% in 2016 (sample sizes were above 35 for all years). This 2016 compliance rate is now comparable to other rule divisions, and may be the result of increased ability to detect these wetlands.

Prevention of fill erosion at stream crossings (75%; OAR 629-625-0320(1)(c)) and the stabilization of fill material at crossings (86%; OAR 629-625-0310(5)) were issues identified in 2014. However, 2016 figures give compliance rates of 92% and 100%, respectively. Sample size in 2016 was 26 for both rules.

Compliance with culvert sizing requirements (OAR 629-625-0320(2)(a)) has varied over the three years of study. Compliance rates were less than 90% in 2013 (85%) and 2016 (73%), but compliance was 96% in 2014.

Compliance rates for ownership classes are both high (≥94%) and moderately stable, with increases of about 2% for both Private Industrial and Private Nonindustrial owners. The "Other" ownership class had compliance rates in the 97-98% range.

Table 7. Compliance rate by Ownership Class, 2013-2016.

	2013	2014	2016
Private Industrial	96%	96%	98%
Private Nonindustrial	94%	96%	96%
Other	98%	98%	97%

There were no apparent trends by Area between 2013 and 2016 (Table 9), with all compliance rates of at least 94%.

Table 8. Compliance rate by Area, 2013-2016.

	2013	2014	2016
Eastern Oregon Area	96%	94%	96%
Northwest Oregon Area	98%	96%	98%
Southern Oregon Area	95%	97%	96%

DISCUSSION

Overall 2016 compliance at the Area and ownership level are high (≥95%), as were 5 out of the 6 rule divisions assessed. Improved compliance rates since 2013 with written plan requirements and protection of small ("other") wetlands were also welcome results. Compliance rates are above 95% for 36 out of the 49 rule applications assessed[4]. Particular areas of high compliance include but are not limited to rules relating to rock pits, road drainage, keeping waste metal out of waters of the state, and skid trails on steep slopes. Compliance rates were between 90% and 95% for another four rules.

The goal of the compliance audit is not only to demonstrate areas of success but rules for which increased compliance can be achieved. Four rules had compliance rates between 80% and 90% and another five rules are below 80% compliance. Based on these findings, ODF will work with partners and both internal and external opportunities to emphasize and address these results.

Training and education efforts will continue to cover areas of high compliance in order to maintain this good performance. The following rules had either low

[4] Note: while this audit was designed to assess 57 rule, 8 rules had no sample points and are thus omitted from this discussion.

compliance rates or significant negative resource impacts, and warrant consideration for further attention:

- Identifying and protecting small water bodies: While there has been considerable improvement on this front (as noted in the previous section), this should remain a point of emphasis.
    - Small Type-N streams: Many operations occur near stream initiation points. Seventy-one percent (71%) of cases of sediment delivery to waters of the state were associated with Small Type N streams. These streams may not be recognized by operators and foresters, particularly under dry conditions. Improved standardization of methods for determining stream initiation is important.
    - Small wetlands: Measured compliance rates with rules concerning wetlands less than a quarter acre continuously improved over the 2013, 2014, and 2016 audit years (72%, 83%, and 98%, respectively). ODF plans to continue education and awareness about these small wetlands to minimize their susceptibility to mechanical entry.
- Properly removing temporary stream crossings on roads: Compliance has improved considerably over previous years, yet still remains below 90%. Although attempts were usually made to remove these crossings, they generally retained some steep fill, or the post-removal banks had over-steepened side slopes. Improvements could be made where erosion control measures are required on remaining fill materials. Perhaps greater understanding of appropriate erosion control techniques is necessary.
- Treating skid trails near streams: Skid trails often were constructed near, or crossed, small Type N streams. As noted in the Results section, these skid trails were generally considered to have inadequate barriers to keep sediment out of streams. Often, where skid trails crossed streams, at the completion of operations the crossing was not adequately removed.. While these crossings did not necessarily result in observed sedimentation at the time of the survey, it did increase the risk of sediment delivery to streams. This risk might be mitigated by training that emphasizes BMPs for skid trails near streams.
- Installing drainage and filtration for roads near stream crossings: In many cases, efforts at installing drainage ditches and waterbars were made, but these installations were often improperly constructed and maintained.

- Effective road maintenance and construction techniques on steep terrain: In the 2016 audit, compliance with road design rules to minimize landslide risk (OAR 629-625-0310) was lower than the average of previous years. Compliance was lowest with end-hauling ((OAR 629-625-0310(2)); 75%) and construction of stable fills ((OAR 629-625-0310(4)); 87%). Training focused on these practices could reduce sidecast failures in steep terrain. This must include proper culvert placement in these steep settings, as erosion below culverts was responsible for some of the largest cases of sediment delivery to streams.

- Removing petroleum products from the forest: Grease tubes, oil jugs, and oil filters were commonly found at landings, which is against the rules. Although they did not pose an immediate water quality hazard, they could have detrimental long-term impacts.

- Maintaining roads: Gullies in roads and blocked drains were frequently observed on the forest. Although these features usually did not contribute sediment to streams, properly maintaining roads prevents resource degradation.

- Designing culverts for 50 year flows: lack of compliance can lead to flooding and road failure.

- Sediment delivery to streams, from roads and skid trails: most instances (55%) of sediment delivery were less than 1 cubic yard but five cases exceeded 10 cubic yards, three of which were greater than 100 cubic yards. Sediment delivery was associated with noncompliance with a variety of rules and a wide range of compliance rates (2-99%). This indicates that even rules with high compliance rates can be associated with instances of significant sediment delivery.

In October 2014, a spatially-explicit online notification system (Forest Activity Electronic Reporting and Notification System, "FERNS") was implemented by ODF. This system has improved the management of notification information for statewide projects like the Compliance Audit. FERNS helps landowners and stewardship foresters to share information about protected resources, and remind them when a written plan or certain measures are required. Compliance studies after 2016 will draw from notifications of operation that began in the FERNS program, which affects the mechanics of identifying the sample sites.

References Available Upon Request

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Oregon Department of Forestry
Private Forests Program

2016

Forest Practices Act Compliance Audit

FIELD GUIDE for CONTRACTORS

June 28, 2016

Introduction

This Field Guide is provided to support efforts to collect data as described in the Statement of Work of **RFP # ODF – 2065 -12** issued by the Oregon Department of Forestry (ODF) in December 2012.

The information herein is intended to supplement and support the Contractor's Work Plan as a reference and a basis for consistent application of standards for data collection, collation and transmittal to the contracting Agency.

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SECTION 1. BACKGROUND INFORMATION

The Oregon Legislature (2011 Legislative Session – Budget Note # 1) directed the Agency to audit rates of compliance with Forest Practices Act standards, and to include the private sector in the process. The Forest Practices Compliance Audit Contract has been developed in response to those instructions. The Contractor and the Agency will work together, in different ways, toward developing useful information in response to the Budget Note. The initial Audit effort was conducted in 2013; 200 sites were visited.

The 2016 Audit effort will focus on visits to 100 sites.

Lessons learned in 2013 are reflected in minor editorial changes to the Field Guide for the 2016 Audit.

The Contractor will gather data to provide a factual basis with which ODF will assess statewide compliance rates of timber harvest activities with Oregon's FPA. The Contractor will collect data but will not evaluate rule compliance. This is the purview of ODF. The Contractor will report on specific site conditions and ODF will determine which rules apply to the conditions, and compare the measured conditions against pre-determined criteria for compliance. ODF analysis of the data will be primarily in the context of the Oregon Forest Practices Act and will reflect standards described in Statue, Rule, and Guidance.

Detailed consideration of standards for Forest Practices Act rules are considered in **Guidance Manuals** for individual rule sections. The Guidance may be viewed on-line at the following website: http://www.oregon.gov/odf/privateforests/pages/fpaguidance.aspx .

The contractor will gather data that will reflect conditions of roads, skid trails, landings, riparian areas, streambanks, and the margins of wetlands and lakes at the sample sites. Some units may not contain examples of all the FPA rules subject to the study.

Sampling will be limited to harvest units that were harvested in 2012 and 2013.

Sampling will be distributed among the three (3) Administrative Areas of ODF: Northwest Oregon, Southern Oregon, and Eastern Oregon. See Figure 5 for map of Area boundaries.

Land ownership categories will include industrial forestland, non-industrial privately owned forestland, and other ownerships, including state, county, and city ownerships. No federal ownerships will be sampled.

The major resource concern for this Compliance Audit is delivery or potential delivery of sediment to Waters of the State.

The Contractor will submit field data to ODF in an electronic digital format.

The ODF will assess the accuracy and consistency of data collected by contractors to ensure the integrity of the expanded values derived from analysis of the data.

Table 1

Typical Data to be gathered at each Sample Unit			
Roads Data	**Waters of State Data**	**Stream Crossings Data**	**Quarries/ Landings Data**
Road Type – entire	Stream Classification	Stream Classification	GPS point
Road Type – section	GPS Points	GPS Point	Type of feature: Q or L ?
GPS point	Stream segment type	Road type	Hillsope at landing
Road Use	Stumps within 20' of Type F or D stream	Fill length	Quarry / Landing issues
Road hillslope	Skid trails within 35' Type F or D stream	Fill Angle	Location of waste at landing
Road width	Cable Corridor Status	Fill Depth	Type of waste at landing
Sidecast/Fill Angle	S/N stream gradient	Culvert inlet diameter	Landslide present at quarry or landing Y/N?
Sidecast/Fill on steep slopes	Vegetation condition within 10 feet of stream	Culvert outlet diameter	Drainage of landing or quarry to streams?
Fill condition	Slash present in stream	Temporary Crossing condition	Photo I.D. of issues
Road cut condition	Slash cover stream, cause ponding	Drainage features above stream crossing	
Gullies present Y/N ?	Disturbance to stream channels	Distance to drainage features above crossing	
Culvert status	Skid trails in stream	Status of water bars	
Water flowing onto road?	Amount of Sediment delivered to stream	Road slope to crossing	
Water flowing onto Slope- issues, slope	Distance of road to stream	Sediment issues	
Connectivity to Waters of State	Photo I.D. of issues	Fill stability issues	
Sediment deliver to Streams? Amount ?		Photo I.D. of issues	
Photo I.D. of issues			

General Data to be gathered:

(n=100)

Notification # **Forester's Name** **Date** **Stream Presence / Classification**

Timber Harvest type **Stream crossings - present/absent** **Access Issues ? Skid trails used: Y/N**

Road Construction: present/absent **Was Road Oiled or Not: Y/N**

Photograph(s) of each Data Type sampled, notes and observations

SECTION 2. PROJECT WORK PLAN

Access to study sites Contractors and ODF District and Unit

The ODF will obtain permission from landowners for the Contractor to access study sites.

ODF Staff will contact landowners for permission to access sample sites, and District/Unit offices to obtain Notifications, Maps, Written Plans and other pertinent data on the sample sites.

ODF will provide Contractor with copies of Notifications, Notification Maps, Written Plans of Operation. Landower Permission to Enter forms will be on file with ODF. Copies will be available to Contractor.

Contractors should contact landowners according to the stated wishes of landowners regarding notification of site visit, or as a courtesy regarding their visit to the site. Likewise, Contractors may wish to inform the local ODF office of their presence in the vicinity. Site specific records have been catalogued on the FTP site in an effort to avoid creating unexpected priorities for local ODF folk.

A map of the locations of ODF offices, and contact information for each, is included in Figure 4 and Section 8.

Contractor Site Visits

First - Contractor provide a weekly work plan to ODF and affirm access information.

At the site - Contractors are encouraged to tread lightly and demonstrate due respect for private lands. If roads have been treated following logging and vehicle traffic is likely to impact road structure or surface, Contractor should defer to walking. If access problems arise, Contractor should contact the Agency Administrator or the local Stewardship Forester for assistance.

When you Leave Notify the Agency Administrator that the site visit has been completed. Submit Unit Data in a timely fashion.

SECTION 3. DEFINITIONS

The Oregon Forest Practices Act, and the forest industry at large, employ some unique nomenclature. The Forest Practices Act contains a collection of definitions.

For general definitions, see OAR 629-600-0100 (Oregon Forest Practices Act – Definitions).

Some terminology will be unique to the Compliance Audit contract. A list of terms is provided here.

"Agency" is the Oregon Department of Forestry. Used interchangeably with "ODF".

"Agency Administrative Area" refers to portions of the area in which the ODF administers the Oregon Forest Practices Act. They are Eastern Oregon Area, Northwest Oregon Area, and Southern Oregon Area. A map of the areas is provided.

"Collector Road" is a principal haul route for > 500 acres (<20,000 acres).

"Contractor" is a person or organization selected by ODF and retained by contract # **RFP # ODF – 2065 -12** to do the work described in the Scope of Work.

"Delivery Schedule" is a list of dates by which various portions of the project should be completed. The delivery schedule is described in the Contractor's Project Work Plan.

"Gully" is an eroded portion of a road, fill, or ditch. Evidence of channelized flow, should be present. For the purpose of the Audit, a gully has a defined edge and is 2" wide and/or 2" deep.

"Landing" is an area constructed for logging equipment and log handling operations. Landings may be at the end of roads, or constructed as wide spots in the road. They are typically wider than the rest of the logging road (ODF State Forests Program Roads Manual). During the 2016 Audit we will consider landings to be areas within the operation area in which earthwork was done to create a surface for the activity. Those areas where shovel logging decked and loaded logs along roads, and no earthwork was done to create a greater footprint than the road prism itself, will not be considered landings. Data on those portions of the operation area will be considered in the Roads Unit Data. The intent of the inquiry for the Landings and Quarries Data Type is to evaluate erosion control measures and the placement of materials generated during the construction and subsequent use of sites that were specifically created for the activity.

"Mainline" – regarding roads, a principal haul route for >5000 acres. Mainlines have outlets onto a state or county public road.

"**Overburden**" – Material removed from one area to access different soil conditions that is placed at another location; soil, duff and stumps, for example. "Sidecast" (see below) could comprise Overburden, but not exclusively. Overburden is a concept typically associated with the preparation of Landings and/or Quarries.

"Sidecast" is soil & rock that has been pushed over the edge of a road or skid trail, or landing . Sidecast can be the product of Road Contruction and/or Road Maintenance, or generated when keeping landings clear. Forest Practice Act Standards consider placement of materials on steep slopes. Typically less than 40% of volume of sidecast is slash. Slash though, could be "sidecast" over the edge of a road, but the method and manner of placement would be about "Slash Placement", not "Sidecast".

"Skid trail" is a track on, or in the forest floor, that has been bladed, excavated or created by repeated traverses toward a landing.

"Slash pile" is a mass of woody debris , limbs, top wood and log trimmings created by logging process. Piles with a rock or soil content of more than about 40% should be coded as "Waste" rather than "Slash". Slash volume and arrangement in the forest varies with logging method.

"Slump" is part of the inquiry about road prism conditions. It is defined as "Downward intermittent movement of rock debris, usually the consequence of removal of buttressing earth at the foot of a slope of unconsolidated material. It commonly involves a shear plane on which a back-tilting of the slumped mass occurs" (Brittanica.com). Slumps of soil, rock, stumps and the like can occur along roads. For purposes of this project, slumps exceeding one cubic yard in volume are recorded.

"Spur Road" is the most outer component of a road system; they dead-end, typically at a landing, and lead to collectors and/or mainlines.

"Stream Crossing" – where logging equipment crosses a stream or wetland of any size. The phrase is both noun and verb. Stream crossings are parts of roads or skid trails, or individual one time events. Elements of Stream Crossings include approach (either side), material placed over the stream (if any – the fill) and the structure that conveys the stream through the fill. The Audit process includes measurements of the elements of the stream crossing which are recorded in a unique data type.)

When Written Plan of Operation is required for Stream Crossings:

A) Crossings of Type F or D streams of any size

B) Unless waived, Permanent Crossings of Type N streams with a fill depth > 15 feet.

C) Unless waived, Temporary Crossings of Type N streams with a fill depth >8 feet.

"Temporary Crossing" is a bridge, ford, or other structure installed across a stream or watercourse for short-term use by logging equipment, construction vehicles or other machinery. The Oregon Forest Practices Act standards for Temporary Stream Crossings and Permanent Stream Crossings differ.

Temporary structures can be designed for site conditions during a limited period of use. Permanent Structures should be designed and constructed to standards for a range of conditions for an indefinite time.

"ODF" is the Oregon Department of Forestry.

"**ODF Area"** means one of three Administrative Areas where the Oregon Department of Forestry administers the Oregon Forest Practices Act. A map of the Areas is included in Attachment 1.

"Ravel" - erosion of a slope that is a result of the steepness of the slope, limits of soil cohesion and/or drying of the slope face. It is considered here in conjunction with sediment delivery to ditches and then possibly streams.

"River Left" is the left bank of a stream facing downstream

"River Right" is the right bank of a stream facing downstream

"Rill" is a stage in the erosional process in which surface runoff concentrated in numerous small (< 2" width) downslope channels that are uniformly spread apart. The presence or absence of rills is a consideration when recording Unit Data for Roads, regarding Fill Condition.

"Road" is a conveyance over which log truck traffic is to pass. Road Construction and Maintenance are the subject of FPA Division 625 – "Forest Roads". The road width is measured from the edge leading

down to a ditch (or the exterior disturbed area if no ditch present) to the other edge. May be unsurfaced or surfaced. (See Figure ___).

- **New**: Built to accommodate the sampled Units harvest.
- Reconstructed: Refurbished pre-existing road, work done to accommodate the sampled Units harvest.
- Pre-exist**ing:** All other road types including decommissioned roads.

"Road Fill" is material placed to support a road. There is an important distinction be tween "fill" and "sidecast", noted below.

"**State**" means the State of Oregon.

"**Stream sample segment" –** streams are defined in the Forest Practices Act.

The "stream sample segment" is introduced to allow determination of the upper extent of the stream sample when streams are discontinuous at the upper end of the stream reach. Use the FPA definition of a stream.

For the **2016 Compliance Audit** consider the **stream sample segment** to begin at the lowest place on the landscape within the unit, and to end at a point beyond which there is 50 feet without a channel, or wetland condition.

If channelized flow is interrupted by a wetland condition, the stream sample segment should include the wetland condition and be continued above it.

If channelized flow is interrupted by a debris flow and there is channelized flow above the debris, continue the stream sample segment above the debris flow.

Unit – A geographic area indicated in a Notification of Operations to State Forester ("Notification"). Units will vary in size and complexity.

For the purpose of the 2016 Audit individual unit boundaries will define the work area for contractors, and the Contractor will be paid on a per-unit basis. Contractors will measure and assess conditions on the ground that were created by timber harvesting activity.

The format for Notification of Operations is a combination of year (4 digits) - ODF office (3 digits) – operation number (5 digits) and unit number (one digit). This would appear as:
2011511000431 for 2011, office 511, operation 00043, and unit 1.

Unit Data – Unit Data is the collection of information Contractors will gather at each unit through measurement and visual estimation.

Unit Data Topics – Unit Data Topics classify Unit Data. There are five (5) Unit Data Topics:

- General Data
- Waters of the State
- Roads
- Stream Crossings
- Landings and Quarries

Not all Units will contain examples of all Unit Data Topics; all units will contain General Data.

Unit Data Values – Unit Data Values are the currency of information collected by Contractors. A Unit Data Value represents one measurement or observation. Unit Data Values are either discrete (yes/ no, present/absent) or continuous (length/slope/depth/width).

Unit Data Standards – The Unit Data Standards describe the required accuracy and precision necessary for the Unit Data

Unit Data Package – A collection of data of **10** units submitted to ODF for review.

Unit Data Package Receipt Date – The date on which ODF receives Unit Data Package from Contractor.

Unit Data Quality Review – Process in which data from Unit Data Packages will to sampled to determine if the Contract standards for precision and accuracy have been met by the contractor.

Unit Data Quality Review Interval - The period of time between the receipt of a Unit Payment Package by ODF and the determination of the conditions of Acceptance for Payment.

Unit Payment Package - A collection of data from 10 units that have been field checked and accepted for payment by ODF. The contractor will submit the Unit Payment Packages with an invoice for payment.

Unit Payment Package Receipt Date – The date on which ODF receives Unit Payment Package from Contractor

Acceptance for Payment indicates the **Unit Data Quality Review** has been applied to a Unit Data Package and the contents of the Package meet the Unit Data Standards. Upon **Acceptance for Payment**, ODF Agency Administrator will submit invoice to ODF Fiscal Services within 3 business days. Payment to contractor must be completed within 45 days of receipt of invoice by Fiscal Services.

Agency Contract Administrator: An employee of ODF will be designated as Contract Administrator to represent the Agency in matters regarding the Contract, work to be done, to periodically inspect the work for conformance with specifications, and to certify work as acceptable for payment.

Contract Supervisor - The person or persons who direct the activities described in the Scope of Work on behalf of the Contractor. The Contract Supervisor must have authority to act on behalf of the Contractor.

Contract Field Foresters - The person or persons actively engaged in gathering data on the subject units. The Contractor, Contract Supervisor and Field Foresters may or may not be the same person.

Landowner - The owner of the land where the Units to be sampled are situated. The Landowner may or may not have conducted the timber harvesting operation that created the conditions that are the subject of the audit. Written Landowner permission is required before data gathering on a particular unit may commence.

ODF Stewardship Forester - ODF Stewardship Foresters administer the Forest Practices Act throughout the state, from the various District and/or Unit offices of the Department of Forestry. Stewardship Foresters and can be a source of useful local information.

Pending Payment Period - The interval between the Acceptance for Payment and the issuance of payment to Contractor. This period is not to exceed 45 days.

SECTION 4. FIELD PROCEDURES

Contractor Field Foresters will visit the sample sites and collect data on each of 5 Unit Data Topics.

Unit Data Topics – Unit Data Topics classify Unit Data. There are five (5) Unit Data Topics:

- General Data
- Waters of the State
- Roads
- Stream Crossings
- Landings and Quarries

Not all Units will contain examples of all Unit Data Topics; all units will contain General Data.

- Contractor will deliver data from individual harvest units in digital form to Agency in a manner described in the approved Project Communications Plan in groups of ten (10) units that will comprise a Unit Data Package.
- Inspection and Certification: Before certifying work as acceptable, Agency will sample work for compliance with contract specifications on a minimum of 10% of the sample units, portions of units or more entire units to ensure contract specifications are met.
- Agency will inspect the data in a Unit Data Package according to the Unit Data Quality Review process and report findings to Contractor.
- Agency will make every attempt to perform all inspections in a timely manner in order to support Contractor's work and payment schedule. However, during certain periods of the field season, availability of Agency personnel may be affected due to emergency situations such as forest fires. This could cause a delay in timely contract administration (unit inspection) that may result in a delay or impact the Contractor. Contractor agrees to release ODF from any liability arising out of delays due to circumstances beyond ODF's control including, without limitation, any delays due to forest fire emergencies.

Section 4.1. Description of Data Collection

The following four data types (waters of state, road, stream crossings, quarries & landings) each have their own associated protocol. For each data type we provide information on data collection, variable definitions and units, and database fields for inclusion. We recommend that each data type include as a final entry a notes section. The notes section allows the Field Forester to provide a description of the situation at the site, and include information not coded in the Unit Data fields.

4.1.A. General Data Collection

Photo documentation

Contractors shall take photographs to document at each unit the unit appearance and conditions. Photographs provide a lot of value to the process and are an essential part of the process of describing the results of the Audit. Each photograph should clearly display the condition it is intended to illustrate. Contractor shall include notes describing why the photograph was taken, along with any other information that might aid with interpretation. Photographs should include a scale reference, such as a stadia rod, person, hardhat, etc. Depending upon conditions at the site, Contractor will photograph the following:

1. General Unit Photos. A representative photograph of each data type should be taken on each unit to document overall location and topography of the unit. The type of operation (clearcut, thin) should be readily apparent.
2. Sediment delivery to streams. Take photographs any time that sediment appears to be delivered from an operational activity to a stream. Examples include (but are not limited to) delivery from an eroding road, unstable road fill, or a quarry in the stream. If possible, take a photograph that shows both sediment source and delivery site. If this is not possible, show source and delivery in separate photographs and clearly record sufficient information to indicate that both photographs are of the same incident.
3. Waste delivery to streams. Take photographs any time other types of operational waste are reaching a stream. Guidelines for photograph content are similar to those for sediment delivery.
4. Petroleum products waste. One or two photographs of typical petroleum waste at the site will suffice. Do not take a picture of every grease tube, for example. Landings and Quarrys Unit Data will provide an opportunity to attribute Petroleum Waste to a particular landing.
5. Equipment tracks in streams and wetlands – stream crossing or mere activity within the waters of the state. Photographs should display the tracks, together with enough of the surrounding area to provide evidence that the tracks are in a stream or wetland.
6. Stream diversion down ditches. Photographs should show enough of the contributing stream and the ditch to establish that diversion is taking place.
7. Quarries in stream boundaries. These will likely be rare. If present, the photograph should be of sufficient scale to show that the quarry is indeed within stream boundaries.

Other General Unit Data

For each unit visited, the contractor will be responsible for collecting unit-level data that provide a context for the other data types. These data include recording:

1. Whether road construction or reconstruction took place within the unit **(yes/no)**.
2. Whether skid trails were used or constructed within the unit **(yes/no)**.
3. The number of stream crossings present within the unit.
4. The types of Waters of State present in the unit (see Waters of State; WOSType).
5. The timber harvest type (**clearcut, thin**).
6. Whether oil was applied to roads in unit (**yes/no**)

Miscellaneous Comments - contractor should provide notes that describe access issues (necessary keys, contacts, best routes for entry to the unit, dogs, impassable obstacles, roads blocked by fallen trees, etc.)

such that the Unit Data Quality Review process may efficiently access units after they have been surveyed by the Contractor. Additionally, pertinent information not suited for the data fields listed should be provided in the miscellaneous comments.

4.1.B. Waters of State Data Collection

Waters of the State

"Waters of the State" and certain features thereof are defined in various sections of the FPA. The initial reference is in "Definitions" - OAR 629-600-0100 (83)(see Appendix A). A portion of the FPA that covers virtually all of the variants is OAR 629-635-0200. Water Protection Rules are outlined in Divisions 635, 640, 645, 650 & 655 of the Oregon Forest Practices Act. Water protection standards are also noted in other Divisions of the FPA rules as well.

We break out size and type categories in the Waters of State Definitions Table (below). Streams are classified by size as Large, Medium, and Small (L, M, S). They are also classified as Domestic Use, Fish-bearing, and Non-fish bearing (D, F, N). These abbreviations are often combined, size first. A large fish-bearing stream may be referred to as LF.

Lakes, for the purpose of this project, are recorded as large or small if they are fish-bearing (LFL, SFL for large & small [> or < 0.5 acres] fish lake), and simply as NL (non-fish bearing lake) if they are > ½ acres.

Wetlands are considered under different rule conditions if they > 8 acres ("Significant Wetland" ("SWL")) or > ¼ acres but < 8 acres ("W1/4") or <1/4 acres ("W<1/4"). If they are < 8 acres and part of a stream course and adjacent to a stream, they are considered stream associated wetlands (SAW), which are to be treated as a portion of the stream with which they are associated .

Seeps or springs should be considered wetlands according to their size (SWL, W1/4, W<1/4). See definitions for (stream) channel and wetland. A bold flowing spring might be included in the upper end determination of a stream channel, in certain circumstances.

Table 2 – Waters of State Definitions

	Abbrev.	Definition	Citation
Water Classifications			629-635-0200
Stream Types			629-600-0100(68)
Fish	F	Fish use	629-600-0100(22), 629-600-0100(77)
Non-fish	N	No fish use	629-600-0100(78)
Domestic	D	Domestic use	629-600-0100(17), 629-600-0100(76)
Stream Sizes			
Large	L	average annual flow > 10 cubic feet/second	629-635-0200(14)(c)
Medium	M	average annual flow > 2, < 10 cubic f/s	629-635-0200(14)(b)
Small	S	average annual flow < 2 cubic feet/second	629-635-0200(14)(a)
Lakes - Types & Sizes			629-600-0100(36)
Large with fish	LFL	> 8 acres, fish use	629-600-0100(38)
Small with fish	SFL	< 0.5 acres, fish use	see guidance for 629-630-0600(3)(b)
Non-fish	NFL	> 0.5 acres, no fish use	see guidance for 629-630-0600(3)(b)
All lakes	AL	> 0.5 acres	
Wetlands			
Significant wetlands	SWL	Wetland > 8 acres	629-600-0100(64), 629-635-0200(16)(a)
Wetland>1/4 acres	W1/4	Wetland > 1/4 acre, < 8 acres	629-635-0200(16)(c)
Wetland<1/4 acres	W<1/4	Wetland < 1/4 acre	629-635-0200(16)(c)
Stream Assoc. Wetland	SAW	Wetland at stream margin < 8 acres	629-635-0200(16)(b)

Riparian Management Area Widths for Streams of Various Sizes and Beneficial Uses are noted in OAR 629-635-0310 (Table 1, pg. 50 January 2016 Oregon Forest Practices Act).

"Waters of the State (WOS) Data Collection Procedure:

"Waters of the State" data are collected on foot. All streams, lakes, and wetlands within the harvest Unit are sampled. GPS points should be taken along the stream course. Additionally on streams where RMAs are warranted (FPA Table 1, pg. 50) the Field Forester will inspect Riparian Management Areas associated with the harvest to observe harvesting if, any, that may occur within the specified distance from the stream.

The Contractor shall determine if harvest occurred within 100' of one or more of the following:

Type F Stream – regardless of size

Type D Stream – regardless of size

Significant Wetland (> 8 acres)

A bog (OAR 6290600-0050(8))

An important spring in Eastern Oregon (OAR 629-645-0000).

For Type F or D streams, and Large or Medium Non-Fish Bearing Streams, the Contractor will identify:

Disturbance to Understory Vegetation within 10 feet of the high water level

Stumps indicating timber harvested < 20' from the edge of the channel,

Evidence of removal of trees that leaned over the channel.

In addition, for Type F or D streams only, the Contractor will identify skid trails within 35' of a channel, and damage associated with cable corridors. Note method of measurement in remarks.

Record a single data point for wetlands and lakes. For streams that are other than small non-fish streams, data are recorded in 200' intervals starting at the edge of the harvest unit. If a stream associated wetland is encountered, record data for the stream and data for the wetland.

While inspecting the RMA, data collectors will search for slash in the stream, road construction waste materials, and incoming equipment tracks, gullies and ruts caused by logging equipment that appear deliver sediment to the stream in question or deposit material close enough to the stream that delivery to the stream is suspected (within 10' of the bankfull width). Observations of distances associated with RMA requirements bears on compliance determinations; precision is important.

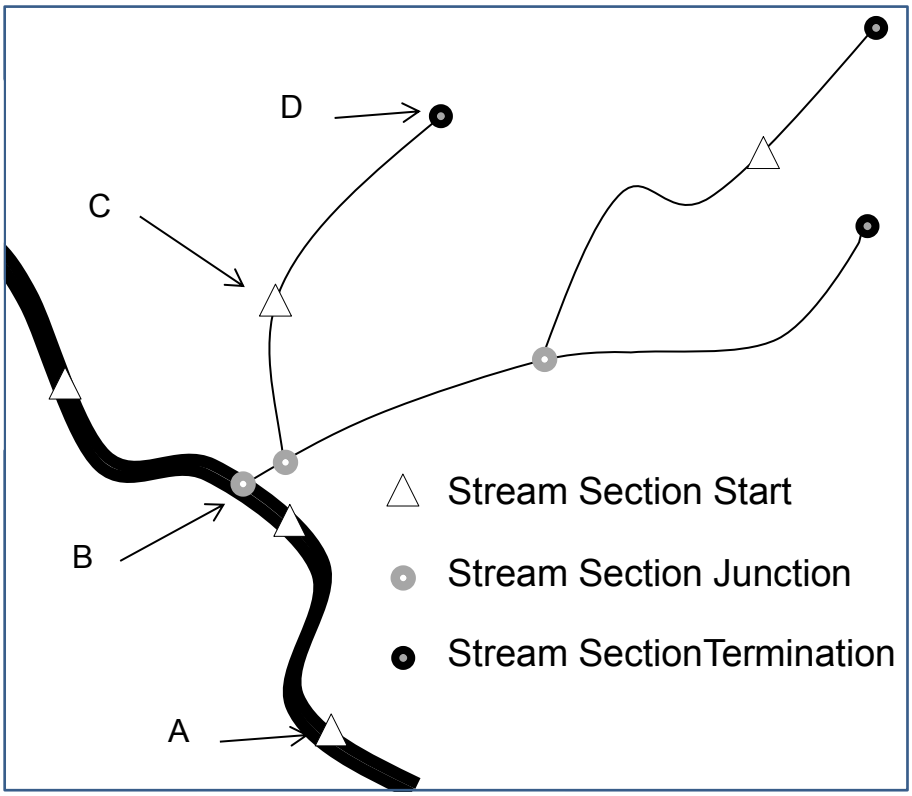
For cable yarding units with RMAs, we strongly recommend that the Contractor travel to all landings where towers were located. From this vantage point any yarding corridors across the RMA should be most visible and easier to count and note. Data are collected either continuously or discretely. For instance, data collection within a section of an RMA-buffered stream will include a tally of stumps within 20' of a channel. Discrete data collection events are conditions encountered that truncate the sampled section. For WOS data collection the conditions that trigger the truncation of a data-collection section include encountering:

- A skid trail within 35' of an F or D stream
- A cable corridor through an RMA
- A slash pile near WOS
- Disturbance to WOS such as machine tracks through a wetland (see WosDisturb below)
- Delivery of sediment from a skid trail
- A road, skid trail, or temporary crossing
- A stream junction or termination point

Data collection for small non-fish (SN) streams differs from other stream types in that the stream section length may be greater than 200'. This is to facilitate data collection along the common SN stream type and to collect slash data in a manner that is consistent with rule language. For small non-fish (SN) streams the Contractor shall collect data while travelling upstream or downstream along the channel. For SN streams begin data recording at their junction with another stream, at the stream initiation point, or at the downstream portion of the stream where it leaves the Unit boundaries. Record the starting point for the SN section and travel along the stream channel until the slope of the stream either becomes greater than 10% or becomes less than 10% for a distance of > 50'. Mark the starting point by noting the point i.d. on a piece of plastic flagging secured at the point at which the GPS coordinates are taken. The point of change represents the end of the previous sampling section and the beginning of the next sampling section. This procedure will produce variable-length stream sections for the purpose of estimating slash cover on the lower gradient portions of the streams. If a stream section is > 100' in length and an incident is discovered (i.e., the conditions listed above), begin a new stream WOS section and record the incident in the new section. Review the definition of **"Stream Sample Segment"** in Definitions, page 6.

When sampling M/N streams where cut stumps are within 50 feet of stream , determine the upper and lower limit of the stream segment that is within 50 feet of the timber harvest (RMA length) by identifying first stump above and below segment that is > 50 feet from stream. There could be more than one such interval per unit. Within that segment (RMA of 50 ft width), collect data for WOS in that segment for following values: **Seg Type, WOST, Stumps 20, Stumps20_other, Cable Corridor, WOSDisturb, Skid Issues, SkidSedVol, RoadDist, and WOS photo.**

Figure 1- Stream Sampling Layout



The start-points of all sections shall be given a unique (within the Unit) GPS location name. A default name provided by the GPS unit is sufficient so long as it is correctly recorded along with the appropriate data and is unique within the unit. Contractor shall record whether the stream GPS points represent a section start, junction, or termination point. The figure above may be used to describe how this process would work. Point A is a starting point for a stream section along an RMA of, say, a fish-bearing stream. It is 100' from the edge of the unit. Other sections along the RMA are spaced evenly at 200' intervals. The data collectors travelled from A towards B. At B they create another stream section start point before they reach 200' but ensure it is labeled as a junction. Data collection continues along the RMA at 200' intervals. The crew returns to travel up the small N stream starting at the junction B. They create a new data entry at the junction to capture the gradient category of the small N stream. They soon reach another junction and sample up that Small N stream towards C. The gradient remained <10% from the junction until they reached a change in gradient, point C. Point C serves as a start point along the N stream. They collect data along the stream until reaching its terminus at D. Because they are recording data for a terminal point, they ensure that data collection for the section to that point is complete. Aside from recording the GPS location of the point, stream type, and the point type (terminal), the crew does not record other data at D. They then travel back to the last junction and continue data collection up the N stream.

While traveling along a section of stream, record all sediment connectivity (channels or gullies delivering sediment to the channel), channel disturbances (e.g., tracks for machinery), metallic waste from the most recent logging operation, slash-caused stream pooling, or bank erosion from slash placement. Record the amount of slash over the channel if the gradient <10%.

Data are listed below that need to be recorded and reported for each section of WOS data. They are to be compiled according to the specifications listed in the table WOS Segment Data:

DataType: This variable is recorded for all WOS data.

Variable Name	**DataType**
Value(s)	"WOS"
Level	Unit

Notification: Provide the Agency notification number for all data collected within a specific harvest unit.

Variable Name	**Notification**
Value(s)	Text
Record for	Unit

Surveyors: Record the name or names of surveyors conducting the data collection on the unit in use.

Variable Name	**Surveyors**
Value(s)	Text
Record for	Unit

Date: Record the date of data collection. Record in the format of "MM/DD/YYYY".

Variable Name	**Date**
Value(s)	MM/DD/YYYY
Record for	Unit

Side: Record the side of the stream RMA data collection is occurring on. Values are "RR" and "RL" for "River Right" and "River Left". River right is the right bank facing downstream. This is recorded only when data are being collected from along the edge of an RMA. Otherwise it is omitted.

Variable Name	**Side**
Value(s)	"RR", "RL"
Record for	WOS Section
Condition	Type F/D (all sizes) and L/M type N streams

SegGPS: A GPS point is recorded at the beginning of each WOS segment. The point name is associated with the data collected for that WOS section. Hang flagging with the GPS point noted on it with marking pen.

Variable Name	**SegGPS**
Value(s)	Text
Record for	WOS Section

Record: The individual record number (starting at 1) begins here. If there are multiple entries to be made for a WOS section, each entry has a subsequent Record number. It could happen that a stream is in a road.

Variable Name	**Record**
Value(s)	Numeric
Record for	WOS Section

SegType: Record whether the GPS point is a start point ("S"), a junction ("J"), or a terminal point ("T"). Terminal points are assigned if a stream ceases to be a stream (lack of bank and/or lack of sorted material) or if a stream passes out of a unit.

Variable Name	**SegType**
Value(s)	"S", "J", "T"
Record for	WOS Section

WOSType: Record type of Waters of State. Record for each WOS section. See above description for types. "AL" stands for "All Lakes". For this audit procedure, "AL" suffices in place of "NFL" and "LFL". Any of these 3 options may be used. Of particular note, if you encounter a "SAW" less than 8 acres, the wetland is to be considered a portion of the stream. Therefore, data recorded for the wetland would be coded according to the corresponding stream type (e.g., "LF" or "SN"). If the wetland were > 8 acres, then it would be considered a significant wetland "SWL". Therefore, "SAW" does not exist as a recorded data type.

Variable Name	**WOSType**
Value(s)	"LF", "MF", "SF", "LN", "MN", "SN", "LD", "MD", "SD", "LFL" " SFL", "NFL", "AL", "W1/4", "W<1/4", "SWL"
Record for	WOS Section

Stumps20: Tally all stumps within 20' of the bankfull width for all streams except SN. If stumps lie within a cable corridor or the felled tree is present, tally under Stumps20_Other.

Variable Name	**Stumps20**
Value(s)	Numeric (tally)
Record for	WOS Section
Condition	All streams but SN

Stumps20_other: Tally of stumps within 20' of the bankfull width of all streams but SN. Use this value for stumps created in conjunction with road construction, skid trail construction, or site preparation, not in the apparent course of timber felling within the unit.

Variable Name	**Stumps20_other**
Value(s)	Numeric (tally)
Record for	WOS Section
Condition	All streams but SN, in cable corridor or felled tree remains

Skid35: Within a WOS section, record the closest distance a skid trail approaches the bankfull width of a D or F stream. Record if ≤ 35' between edge of skid trail and stream bankfull width. If a skid trail lies within 35' and delivers to a stream, it would be reported in the column Skid35 (distance to stream if < 35') and in SkidIssues as SOTH.

Variable Name	**Skid35**
Value(s)	Closest approach of skid trail
Record for	WOS Section
Condition	F, D streams. Record for all skid trails within 35' of bankfull width
Units	Feet

CableCorridor: Within a WOS section, record (if present) whether a cable corridor caused soil disturbance within 20' of a stream's bankfull width (CYS), a cable corridor is present but no soil damage is evident (P), or if damage is present but apparent repairs have taken place (DR; mulching, seeding, or other stabilization activities).

Variable Name	**Cable Corridor**
Value(s)	"CYS", "P", "DR"
Record for	WOS Section
Condition	Record if cable corridor through RMA is present. All streams except SN., and record for SWL and AL.

SN_Grad: Record at the beginning of a SN WOS section where a gradient change occurs (see text above) for an upstream distance of > 50'. Record whether the gradient changes to <10% or ≥10% (absolute value – not a change from [e.g.] 30% to 20%).

Variable Name	**SN_Grad**
Value(s)	"< 10%", "≥ 10%"
Record for	WOS Section
Condition	SN

Veg10: Determine if all < 6" conifers & vegetation retained within 10' of SN perennial bankfull width. Record for all perennial SN streams except those in Coast Range and Western Cascades (for map see Figure 1 in FPA; a GIS version of the map will be provided to Contractor). Record for damage beyond minor disturbance required for extracting trees (e.g., harvester tracks along channel edge). Obtain perennial status from information supplied by Stewardship Forester. Does not apply to cable corridors or stream crossings.

Variable Name	**Veg10**
Value(s)	"Y", "N"
Record for	WOS Section
Condition	Perennial SN in regions specified in FPA Table 5 (Page 51); regions in Figure 1 (Page 48). Does not apply to cable corridors or crossings.

SlashCover: Estimate the percentage of the SN WOS section (<10% gradient only) that was covered with slash.

Variable Name	**SlashCover**
Value(s)	Continuous
Record for	WOS Section
Condition	SN channel < 10% gradient
Units	Percentage (5% increments)

WosDisturb: This is a column that covers a substantial number of conditions. Be aware that not all conditions apply to all WOS. Streams may receive values that other WOS types do not. Values:

SPI: Slash pile within a channel,wetland, or lake. If the slash pile is outside of a channel's bankfull width, see SP10.
SP10: Slash within 10' of a channel's bankfull width but not in the channel's bankfull width
SPO: Slash in a stream causes ponding of water, slash is left in ponded water, or slash left in a lake, or evidence that ponding has occurred due to slash in a channel that is dry at the time of survey.
SE: Slash erosion. The stream banks are eroding due to the flow of water around slash.
TR: Track or rut. Machinery has been operated into a lake or into the channel of a stream. Look for treadmarks (paired linear depressions) in the shore or channel.
SI: Sidecast. Dirt or rock that has been moved aside in the act of harvest or road building and has ended up in the WOS.
ST: Stumps. Tree stumps are present in WOS, stream bankfull width, lake high-water marks.
MW: Metallic Waste. Metallic waste (cables, treads) from *recent harvest activities* (not legacy) is detected within WOS or their high-water marks.
RR: Road rock. Road rock has entered WOS as a consequence of road building.
CR: Channelized or Relocated. A stream channel at a temporary crossing has been channelized, relocated, or diverted due to something other than road construction (e.g., log decking from a landing).
AR: Add or remove soil/rock. A stream channel has had soil or rock material added to it or had it taken away due to activities other than road construction (e.g., landing construction).

Variable Name	**WosDisturb**
Value(s)	"SPI", "SP10", "SPO", "SE", "TR", "SI", "ST", "MW", "RR", "CR", "AR"
Record for	WOS Section
Condition	Streams: CR, AR, SPO, SE Wetlands: see "All" Lakes: see "All", SPO All: MW, SI, ST, SPI, RR, TR, SP10

SkidIssues: Record connectivity issues for skid trails. If a skid trail is connected to the WOS , determine whether the skid trail is oriented straight up a steep (>60% or >40% for highly eroding soils) hillslope for a distance of >100 feet ("SUC"). If the skid trail is connected to WOS and steep (connectivity originated from slopes >60% or >40% for highly eroding soils) but not oriented directly up a hillslope, record "SSC".

The final category is more general. If a skid trail does not meet the previous conditions but is still connected to a WOS, record "SOTH".

Variable Name	**SkidIssues**
Value(s)	"SUC", "SSC", "SOTH"
Record for	WOS Section
Condition	Skid trail connected to WOS

SkidSedVol: Record the estimated amount of delivery for any detected inputs of sediment into WOS that originated from skid trails. Values are in cubic yards and are recorded as 0-1, 1-10, 10-100 or > 100 cubic yards of sediment. If gully erosion has occurred leading to the WOS, use the gully shape to assist in estimating the delivered volume.

Variable Name	**SkidSedVol**
Value(s)	"0-1", "1-10", "10-100", ">100"
Record for	WOS Section
Condition	Skid trail connected to WOS

RoadDist: If a road is **less than 50 ft. away** (<50'), record "integer" (<50). If road is **greater than 50 ft** away, enter "**999".** Do not include skid trails in this measurement (but do include the distance to temporary crossings).

Variable Name	**RoadDist**
Value(s)	"integer (<50)" "999"
Record for	WOS Section
Condition	All WOS
Units	Feet

WrittenPlan: Record whether the following conditions are encountered: stumps and/or yarding corridors found within 100' of an F or D stream (WP100) or Significant Wetland.

If found, please note in comments if the logs were removed. Note if yarding corridors through RMAs (WP Yard) of Type F or D or Medium or Large Type N streams and all Lakes and Significant Wetlands (SWL). Once one of these conditions is detected or measured, it does not need to be recorded again for any WOS section within that harvest Unit, but the notes should reflect multiple occurences.

Variable Name	**WrittenPlan**
Value(s)	"WP100", "WP_Yard"
Record for	WOS Section
Condition	WP100: F/D WP_Yard: no SN, Wetlands=SWL

WOS_Photo: Record photographs of issues regarding WOS connectivity and vehicle tracks within wetlands, stream channels, or lake banks. See photograph requirements in section 1.A.

Variable Name	**WOS_Photo**
Value(s)	Text
Record for	WOS Section
Condition	WOS connectivity, vehicle tracks

4.1.C. Roads Data Collection

Data collection procedure:

Roads are defined as conveyances over which log trucks may pass. Road data collection begins at the location where a road enters a harvest unit or from a junction of one road from another. It may be best to sample Waters of the State data first to ensure all the intersections between roads, logging practices and streams are identified and noted.

Road data collection takes place at some point after WOS data collection; other data types may be collected prior to the road data. We suggest collecting information on Roads, Landings, Quarries, and new Stream Crossings together. That is, as road data is collected the Contractor will encounter landings and new crossings. We encourage them to collect information on these other features as is most efficient.

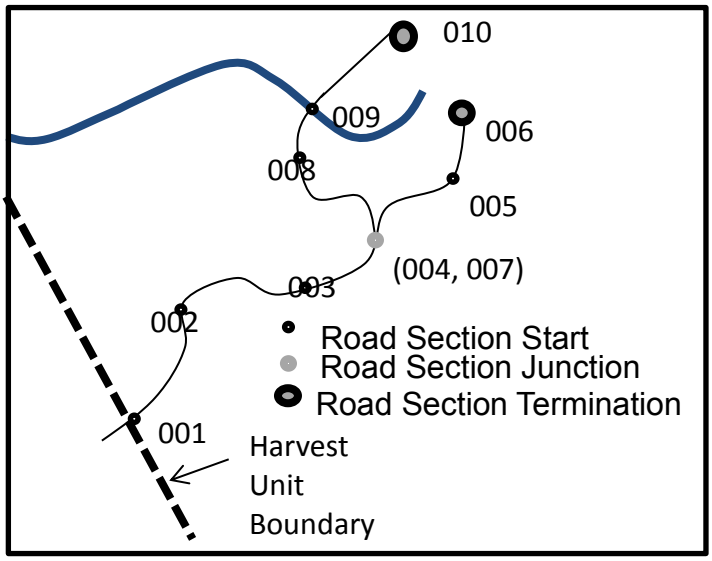
Road data are collected in 200' sections. The distance between sections may be determined using pacing, laser rangefinder, stringbox, or GPS unit that determines distance traveled. Data are collected at the startpoints of each section and between the startpoint and endpoint as encountered. Startpoints shall be individually recorded as GPS points, and those points given names unique within the Unit. GPS points should be identified with paint on the road surface or a piece of flagging with the point i.d. noted. The termination point will often be at a landing; truncate the road section length where data collection for the landing is appropriate.

Similar to WOS data collection, road data are collected at start points, junction points, and between points as conditions are encountered. Conditions that would trigger the starting point of a new road section include encountering:

- Any delivery of sediment to WOS
- Stream crossings, landings, and quarries
- Road junctions

For instance, in the following figure, the field crew started data collection at 001 and indicated that it is a road section start point. They collect data every 200' and reach start points 002 and 003. Point 004 is a road junction and came sooner than the 200'. The crew continued up the right fork and obtained data at 005 and then came to the end of the road and recorded a termination point at 006. The crew went back to 004, recorded that they were starting anther road section by recording 007 in the same location, traveled 200' to 008, and soon came to a stream crossing, recorded data on the crossing, and began a new road station. They finished data collection for the section between 009 and 010, recorded 010 as a termination point and did not record any more road data.

Figure 2 – Roads Sampling Layout



The FPA does not define different types of roads yet the guidance does indicate that rules apply differently (see Guidance for 629-625-310[4]). In this case, we have three road types and three conditions for those roads. The types are Spur, Collector, and Mainline. A Mainline is a principal haul route for >5000 acres. Mainlines have outlets onto a state or county public road. Collectors are principal haul routes for > 500 acres (<20,000 acres) and connect other roads. Spurs dead-end and split off from collectors and/or mainlines.

The Forest Practices Act defines roads (OAR 629-600-0050 as (3) Active (logs are being hauled),(39) Inactive (logging is done but the road is being used for other management purposes, and (88) Vacated (roads that have been removed from the system, are no longer passable.

For the purpose of this study Road conditions include New Roads, Reconstructed Roads, and Legacy, or Pre-Existing Roads. The same rules apply to road construction and road re-construction. If it the road was Reconstructed during the subject operation,we will apply current standards for road construction..

The Legacy roads that are being sampled are those that were used for haul in the recent harvest event.

There may be legacy roads in the Unit that were not used. If not used, do not sample.

Roads used during the operation may be decommissioned or vacated in a number of ways. The FPA defines "vacated" roads. These roads still require a Roads Section survey effort to evaluate delivery of sediment to WOS, if they were used during the harvest operation.

A primary concern with roads is their connection to WOS. Perhaps a road ditch leads directly to a stream without a settling basin or appropriate cross-drain. Sediment could enter WOS from gullies on the road surface, over the road fill, from a cross-drain, etc. Establishing connectivity to WOS and the circumstances of the road condition associated with the connectivity allows the Agency to determine compliance and the pertinent rule..

If gullies or other deposited sediment are visible and lead from the road surface, fills, or drainages, the Contractor shall physically follow the sediment or gully from the road downhill to where the gully or sediment disappears /deposits (disperses) away from WOS or delivers/lies within 10' of WOS.

An important distinction about Road Segment data collection relative to Stream Crossings has to do with road ditches. If a road ditch has a gully in it and delivers sediment to WOS, it is important to ask how the ditch delivered the sediment. Did the ditch enter a ditch-out that was not at a stream crossing, but led to WOS anyway? In that case, the Road Section data would indicate that the ditch was gullied (**Gullies; D**) and that the road section connected to WOS (**WOS_Conn**).

If the gullied ditchline ran straight to a stream crossing and deposited sediment within 10' of the stream, once again the Contractor records that the ditch was gullied and that it connected to WOS in the Road Segment data sheet (WOS_Conn; DI). But because a stream crossing was involved, the Contractor also records that the ditch delivered sediment within 10' of a stream on the Stream Crossing data sheet. If a stream crossing is involved, the Contractor records the status of the road leading to the stream crossing (Road Section) separately from the condition of the stream crossing itself (Stream Crossing); some data may be recorded twice – once for Roads and once for Stream Crossings.

A concern related to connectivity is the potential for road building activities to result in conditions that could trigger a landslide that could deliver material to WOS. For this reason Roads data collection requires frequent measurements of hillslope angles. Presence of sidecast (or overburden) and road cut and fill conditions are evaluated. We define the difference between sidecast and fill to avoid confusion when quantifying conditions of either. The two can be of similar or identical material and/or origin. Sidecast is excess material placed at the side of or over the edge of a road, potentially over the top of existing fill.

While collecting data on road sections, record data on road condition (width, presence of gullies), hill slope, cut and fill conditions, drainage condition, and delivery to WOS. Data that need to be recorded and reported for each road section's data are listed below and compiled with example entries in the table Road Segment Data:

DataType: This variable is recorded for all Roads data.

Variable Name	**DataType**
Value(s)	"Road"
Level	Unit

Notification: Provide the Agency notification number for all data collected within a specific harvest unit.

Variable Name	**Notification**
Value(s)	Text
Record for	Unit

Surveyors: Record the name or names of surveyors conducting the data collection on the unit in use.

Variable Name	**Surveyors**
Value(s)	Text
Record for	Unit

Date: Record the date of data collection. Record in the format of "MM/DD/YYYY".

Variable Name	**Date**
Value(s)	MM/DD/YYYY
Record for	Unit

SecGPS: A GPS point is recorded at the beginning of each road section. The point name is associated with the data collected for that WOS section.

Variable Name	**SecGPS**
Value(s)	Text
Record for	Roads Section

Record: The individual record number (starting at 1) begins here. If there are multiple entries to be made for a Roads Section, each entry has a subsequent Record number.

Variable Name	**Record**
Value(s)	Numeric
Record for	Roads Section

RSecType: Record the road section data type: road section start point ("S"), junction ("J"), and termination ("T"). Road section data are not recorded for termination points.

Variable Name	**RSecType**
Value(s)	"S", "J", "T"
Record for	Roads Section

RoadType: Record the type of road for data collection. Roads types include mainline, connector, or spur (M, C, S, respectively. See above for definitions). If the road is pre-existing prior to the unit harvest it will get one of those three labels. The three categories of road types are recorded as "NM", "NC", or "NS" if the road was new or reconstructed at the time of the harvest.

Variable Name	**RoadType**
Value(s)	"M", "C", "S", "NM", "NC", "NS"
Record for	Roads Section

RoadUse: Record the use and accessibility of the road section. If a road is generally used only for the purposes of forestry, record "F". This is the default value. If the road section has been receiving non-forestry traffic, record the section as multiple uses "MU".

Variable Name	**RoadUse**
Value(s)	"MU", "F"
Record for	Roads Section

RoadHSlope: Road hill slope. At the beginning of each Roads Station record the native slope at the low side of the road, in percent.If the road is on a ridgetop and less than one road width to the top of the slope, record the native slope on the low side of the road and record "**Ridgetop Road"** in the remarks. If there is no downhill slope (road is lower than the surrounding slopes) then record a zero. If the road is perpendicular to the contour of the hill, the slope of the road surface may provide this measurement as long as the difference between the slope of the road and slope of the hill is within the range noted in Table 12 on Page 52.

Variable Name	**RoadHSlope**
Value(s)	Numeric
Record for	Roads Section
Units	ones, %

RoadWidth: Record at beginning of station. Road width is measured from one edge of the road surface to the other. The road surface includes the running surface and associated surfaces that could support travel. Measure width from the top of the toe of fill, edge of ditch, or the edge of soil disturbance. Take the measurement 50' beyond the starting point if the point coincides with a turnout or curve widening. If the measurement location still coincides with a curve widening or turnout, move another 50' along the Roads Section.

Variable Name	**RoadWidth**
Value(s)	Integer
Record for	Roads Section
Units	ones, Feet

SteepSdcastFill: Where sidecast or fill are present and the hill slope at those locations is greater than 60% (40% for granitic soils), record their presence; "S" for sidecast, "F" for fill.

Variable Name	**SteepSdcastFill**
Value(s)	"F", "S"
Record for	Sidecast or Fill present on slope > 60% or 40% (granitic soils)

FillCond: Record the condition of fill for a road section if fill is present. "OK" indicates that the following conditions were not encountered. "SL" indicates slumps or depression along edge of road over fill that is greater than a square yard in area. "BD" indicates that drainage from a berm is directed onto fill. "WA" indicates that organic waste such as slash, stumps, or logs is incorporated in the road fill, usually at the fill base. "ER" indicates that the road fill is evidencing erosion in the form of rills or gullies. If multiple conditions are present, record them as separate Records under the same SecGPS identifier.

Variable Name	**FillCond**
Value(s)	"OK", "SL", BD", "WA", "ER"
Record for	Roads Section
Condition	Fill present

RoadCutCond: Record if road cut is present. If individual slumps or dry ravel in the road cut result in the movement of > 1 cubic yard of earth ? material, record “SL”. If rills or gullies are evident in the cut, record “ER”. If neither condition is present, record “OK”. If both conditions are present, record “SLER”.

Variable Name	**RoadCutCond**
Value(s)	"OK", "SL", "ER", “SLER”
Record for	Roads Section
Condition	Road cut present

Gullies: Record when gullies are present in the road surface, fill, hillslope, or ditch. Gullies in the hillslope, road surface, fill, and ditch are recorded respectively as "H", "R", "F", and "D". If gullies are present in multiple surfaces types record the types they occur in (e.g., “RF”).

Variable Name	**Gullies**
Value(s)	"H", "R", "F", "D", or combinations
Record for	Roads Section
Condition	Record when gullies present

CulvertStatus: Record when stream or ditch culverts are present. If the culvert is a stream culvert on a new or reconstructed road, fill in this value and record appropriate information for New Stream Crossings. For stream culverts record “S-OK” if the culvert is <10% blocked, “S-PB” if partially blocked (10-70% blocked), and “S-CB” if completely blocked (>70%). The same blockage percentages apply to drain culverts (“D-OK”, “D-PB”, “D-CB”).

If a second drain culvert is encountered in a road segment, a second record for the road section is entered-record the status of all culverts at the site.

Variable Name	**CulvertStatus**
Value(s)	"S-OK", "S-PB", "S-CB", "D-OK", "D-PB", "D-CB"
Record for	Roads Section
Condition	Record when culverts present

FlowDirFrom: If flow is directed onto a road, indicate if the source was a blocked stream culvert (“C”), blocked cross-drain (“X”), blocked ditch “D”, or from a wet area (spring, seep, etc.; “W”) that road construction uncovered or crossed.

Variable Name	**FlowDirFrom**
Value(s)	"C", "X", "D", "W"
Record for	Roads Section
Condition	Flow directed onto road

FlowDirTo: Record if road drainage is directed onto an unarmored fillslope ("U"). The presences of rills or gullies in the fillslope is evidence that armor is absent.

Variable Name	**FlowDirTo**
Value(s)	"U"
Record for	Roads Section

WOS_Conn: Record if road conditions result in connectivity to WOS. We interpret connectivity as occurring if sediment is visibly deposited with 10 feet of WOS and/or an erosive gully leads from the incident to WOS. Record whether the initiation point for delivery was a drain outflow ("DO"), blocked cross-drain or culvert ("BXD"), a ditch ("DI"), road runoff ("RR"), berm drainage ("BD"), erosion or gullying of a road cut or fill ("FC"), if there was connection between an oiled road surface and the WOS ("OR"), or if there is another connective path from the road ("OT"; source not listed here). The final code, "DIV", is recorded when Contractor encounters a stream that is diverted along the road ditch or road surface instead of passing under the road in a stream culvert. Road conditions related to these connectivity sources are recorded individually. If two or more **WS_Conn** conditions occur within 50 feet of each other, Contractor may use the same GPS point but shall record separate data entries to capture conditions relating to each source. If one **WOS_Conn** condition (BXD, for example) results in another **WOS_**Conn condition (DIV, for example) more than 50 feet away, record two separate GPS points. When road conditions are affected by drainage conditions, good notes are important. Take photos of WOS _Conn situations that will tell the story well.

Road drainage conditions could result in streams flowing over, or down roads for a distance. One instance of "BXD" could create multiple instances of "DIV".

Variable Name	**WOS_Conn**
Value(s)	"DO", "BXD", "DI", "RR", "BD", "FC", "OR", "OT", "DIV"
Record for	Roads Section
Condition	WOS connectivity detected

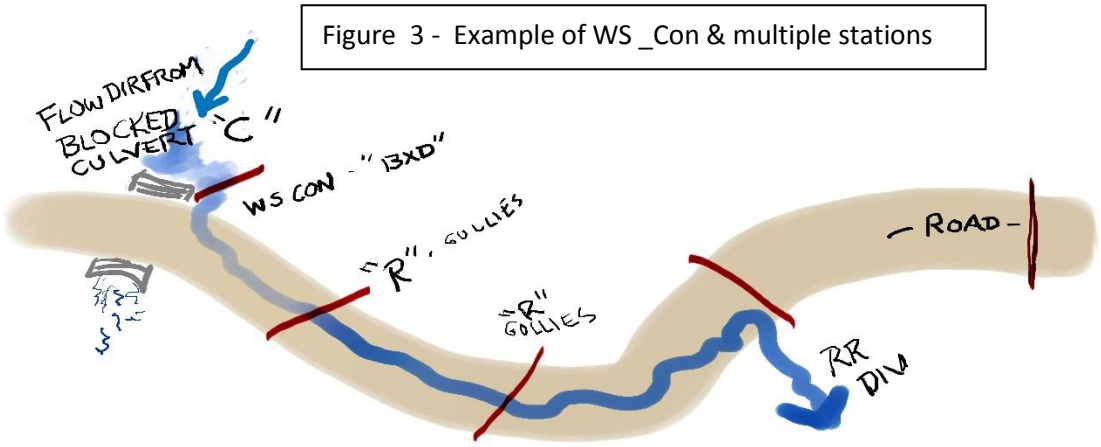
WOS_AmtDeliv: For WOS that received sediment from a road-related activity, record a visually-deduced amount of sediment delivery. Amounts are recorded as categories of magnitude: 0-1 cubic yards, 1-10 cubic yards (10 = 1 dump truck load), 10-100 cubic yards, and > 100 cubic yards.

Variable Name	**WOS_AmtDeliv**
Value(s)	"0-1", "1-10", "10-100", ">100"
Record for	Roads Section
Condition	Delivery of sediment to WOS

PhotoID: Record the identifier for photographs associated with a specific condition, primarily WOS connectivity for Roads Section data. See photograph requirements in section 1.A.

Variable Name	**PhotoID**
Value(s)	Text
Record for	Roads Section
Condition	WOS connectivity

Figure 3 - Example of WS _Con & multiple stations



4.1.D. Stream Crossings

Data collection procedure:

Stream crossings in roads or skid trails may occur at streams or wetlands of any size. Stream crossings include temporary crossings as well as the placement of more permanent structures.

For each stream crossing the Contractor will determine the fill depth of the crossing either directly for shallow installations or, for deeper fills, by recording the downstream fill length and angle as measured from the road surface; ODF will then derive fill depth. Fill Depth is an element of certain rule requirements.

Culvert size, as a reflection of area drained and region, is also an element of rule requirements.

The use of effective erosion control practices are an element of rule requirement for the construction, and the use and subsequent removal of temporary crossing stream crossings for both skid trails and roads. Unit Data will reflect conditions at the site.

The distinction between crossings that were intended for temporary use and not removed, and permanent installations will require professional judgement by Field Foresters. Describe the condition in the Notes.The determination should reflect the apparent intended future use, if any, of the skid trail or road for which the crossing was installed. If the approaches are fully blocked with slash, for example, it's a good bet the crossing was intended as a temporary measure, and should be considered as such.

Crossings installed on Type F or Type D streams should be described in a Written Plan of Operation.

Crossings with a fill depth in excess of 8 feet in any stream (F,D or N) should be described in a Written Plan unless the requirement was waived by ODF.

Data collection focuses on the crossing itself and the condition of the road/skid trail leading to the crossing. Data gathered on the skid trail/road approaches are divided into river right (RR) and river left (RL; see Definitions). Data are collected on delivery of sediment from the road/skid trail surface or ditches and the placement of drainage features to assist in determining the adequacy of the installation relative to the requirements of the FPA rules.

It is critical for the Contractor to be aware of issues arising that are related to Road Sections, WOS Sections, and Stream Crossings within close proximity to one another. For example, say a stream culvert is plugged, causing a diversion of flow onto a road. That information is recorded under the Road Station **CulvertStatus** (e.g., **CulvertStatus** = SCB and most likely **WOS_Conn** = BXD) entry. Contractor would also collect data for the stream crossing.

The columns for "Issues" may require multiple entries. If more than one issue is detected at a crossing, record multiple Record values for the crossing with each containing one of the issues. Retain the XingGPS value for the additional entries; all other values except for Issues do not need to be filled in. Repeat this procedure until all of the detected issues are recorded.

Data that need to be recorded and reported for each stream crossing used during the operation are listed below:

DataType: This variable is recorded for all Stream Crossing data.

Variable Name	**DataType**
Value(s)	"Stream Crossing"
Level	Unit

Notification: Provide the Agency notification number for all data collected within a specific harvest unit.

Variable Name	**Notification**
Value(s)	Text
Record for	Unit

Surveyors: Record the name or names of surveyors conducting the data collection on the unit in use.

Variable Name	**Surveyors**
Value(s)	Text
Record for	Unit

Date: Record the date of data collection. If data collection spans multiple days, record the specific date that data collection for a specific crossing occurred. Record in the format of "MM/DD/YYYY".

Variable Name	**Date**
Value(s)	MM/DD/YYYY
Record for	Unit

XingGPS: A GPS point is recorded at the stream crossing; if the crossing is a road crossing, use the GPS point name recorded for the road data startpoint beginning at the crossing. If the crossing is a skid trail crossing that was encountered while taking WOS data then use the same GPS point name as was used to define the next GPS start point for the WOS data. The same GPS point, identified here or for WOS, will be used again if the crossing is a road (not skid trail) crossing. We are not concerned about which data sheet the GPS identifier is named under. Instead, we are interested in these convergent data-collection points to simply share the same identifier.

Variable Name	**XingGPS**
Value(s)	Text
Record for	Stream Crossing

Record: The individual record number (starting at 1) begins here. If there are multiple entries to be made for a Stream Crossing, each entry has a subsequent Record number.

Variable Name	**Record**
Value(s)	Numeric
Record for	Stream Crossing

StreamType: Record the type of stream that the Stream Crossing crosses over. Streams include all combinations of stream size (Large, Medium, Small; L, M, S) with stream type (Non-fish, Domestic, Fish-bearing, Significant Wetland; N, D, F, SWL)

Variable Name	**StreamType**
Value(s)	"LN", "LD", "LF", "MN", "MD", "MF", "SN", "SD", "SF", "SWL" "WL ¼" "W<1/4"
Record for	Stream Crossing

CrossingType: Record the type of crossing. These include new ("N"), reconstructed ("R"), present pre-harvest ("P"), and skid trail ("S"). A new or reconstructed crossing is one that appears to have been altered at the time of the operation (i.e., less than 5 years ago).

Variable Name	**RoadType**
Value(s)	"N", "R", "P", "S",
Record for	Stream Crossing

FillLength: Record the downstream fill length from the edge of the road surface to the toe of the fill adjacent to the stream culvert. Measurements are made in feet, rounded to the nearest foot. **FillLength** and **FillAngle** will be used to calculate the fill depth. If fill depth is directly measurable (see FillDepth, below) then **FillLength** does not need to be recorded.

Variable Name	**FillLength**
Value(s)	Integer
Record for	Stream Crossing
Condition	Crossing fill present
Units	Feet
Allowable Error	3 feet

FillAngle: Record the downstream fill angle of the edge of the road surface at a point along the road perpendicularly adjacent to the culvert.

Variable Name	**FillAngle**
Value(s)	Integer
Record for	Stream Crossing
Condition	Crossing fill present
Units	%

FillDepth: In instances where the fill depth is shallow (<8 feet), the depth may be measured by pocket leveling rod. This measurement can be used in place of recording **FillLength**.

Variable Name	**FillDepth**
Value(s)	Integer
Record for	Stream Crossing
Condition	Crossing fill present
Units	Feet

CulvertWidth_In: Record the diameter of the stream crossing culvert inlet for a crossing. If the crossing is a bridge, enter 999. If the crossing is a box culvert, record the width. If the inlet of the culvert has been damaged or compromised (partially crushed, bent, torn, etc.) record the minimum diameter. If the culvert is a pipe arch culvert record the span here and the rise in PARise_In. All measurements are in inches, rounded to the nearest inch.

Variable Name	**CulvertWidth_In**
Value(s)	Integer
Record for	Stream Crossing
Condition	
Units	Inches

PARise_In: If a pipe arch culvert is present, record the pipe arch's rise at the inlet. If the culvert is partially buried by stream sediment record the maximum rise. All measurements are in inches, rounded to the nearest inch.

Variable Name	**PARise_In**
Value(s)	Integer
Record for	Stream Crossing
Condition	Pipe Arch Culvert
Units	Inches

CulvertWidth_Out: Record the diameter of the stream crossing culvert outlet for a crossing. If the crossing is a bridge, enter 999. If the crossing is a box culvert, record the width. If the outlet of the culvert has been damaged or compromised (partially crushed, bent, torn, etc.) record the mzinimum diameter. If the culvert is an arch culvert record the span here and the rise in PARise_Out. All measurements are in inches, rounded to the nearest inch.

Variable Name	**CulvertWidth_Out**
Value(s)	Integer
Record for	Stream Crossing
Condition	
Units	Inches

PARise_Out: If an arch culvert is present, record the arch culvert's height at the outlet. If the culvert is partially buried by stream sediment record the maximum height. All measurements are in inches, rounded to the nearest inch.

Variable Name	**PARise_Out**
Value(s)	Integer
Record for	Stream Crossing
Condition	Pipe Arch Culvert
Units	Inches

TempXing: For all temporary crossings used during the harvest,record whether the structure associated with the temporary crossing has altered streamflow and led to erosion of bed or banks (Streamflow alteration, SFA), whether the crossing structure has experienced stream erosion (SE), whether the structure has not been removed (XNR)-(if fill slopes are at a 1:1 slope, or greater, record XNR), or whether there is ponding behind fill associated with the temporary crossing (Sidecast ponding, SCP), or if the temporary crossing is in OK condition (OK). Additionally, if the fill depth appears to have been > 8 feet deep based on the depth of the approaching road or skid trail, record "Fill".

Variable Name	**TempXing**
Value(s)	Blank, "SFA", "SE", "XNR", "SCP", "OK", "Fill"
Record for	Stream Crossing
Condition	All streams

If the temporary stream crossing has been removed , have the slopes been laid back and made stable? Vegetated ?

Drainage_RR: Record the drainage feature type to the river right of crossings and temporary crossings. The drainage types include cross drains ("X"), cross ditches ("C"), water bars ("W"), other ("O"), and none ("N"). The "N" value would be assigned if no structure were present within 50 feet of a stream. A cross-ditch is an exaggerated version of a water bar. It has a ditch and berm that alone or together would prevent vehicle passage. A water bar looks similar but is drivable. In the case that there is more than one variety to the river right of a crossing, record the type closest to the river-right stream bank.

Variable Name	**Drainage_RR**
Value(s)	Blank, "W", "C", "O", "N", "X"
Record for	Stream Crossing

Drainage_RL: Record the drainage feature type to the river left of crossings and temporary crossings. The drainage types include cross drains ("X"), cross ditches ("C"), water bars ("W"), other ("O"), and none ("N"). The "N" value would be assigned if no structure were present within 50 feet of a stream. In the case that there is more than one variety to the river right of a crossing, record the type closest to the river-right stream bank.

Variable Name	**Drainage_RL**
Value(s)	Blank, "W", "C", "O", "N", "X"
Record for	Stream Crossing

RR1: Record the distance to the first drainage feature encountered along the river-right skid trail or road. For temporary crossings the distance is measured from the stream bankfull width midpoint in the temporary crossing. For roads the distance is measured from the midpoint of the road above the stream culvert. If the distance is > 50' or is not apparent, record 999.

Variable Name	**RR1**
Value(s)	Integer
Record for	Stream Crossing
Condition	
Units	Feet

RR2: Record the distance to the second drainage feature encountered along the river-right skid trail or road if the stream is a medium or large stream. If it is a small stream record nothing. For temporary crossings the distance is measured from the stream bankfull width midpoint in the temporary crossing. For roads the distance is measured from the midpoint of the road above the stream culvert. If the distance is > 125' or is not apparent, record 999.

Variable Name	**RR2**
Value(s)	Integer
Record for	Stream Crossing
Condition	M or L stream
Units	Feet

RL1: Record the distance to the first drainage feature encountered along the river-left skid trail or road. For temporary crossings the distance is measured from the stream bankfull width midpoint in the temporary crossing. For roads the distance is measured from the midpoint of the road above the stream culvert. If the distance is > 50' or is not apparent, record 999.

Variable Name	**RL1**
Value(s)	Integer
Record for	Stream Crossing
Condition	
Units	Feet

RL2: Record the distance to the second drainage feature encountered along the river-left skid trail or road if the stream is a medium or large stream. If it is a small stream record nothing. For temporary crossings the distance is measured from the stream bankfull width midpoint in the temporary crossing. For roads the distance is measured from the midpoint of the road above the stream culvert. If the distance is > 125' or is not apparent, record 999.

Variable Name	**RL2**
Value(s)	Integer
Record for	Stream Crossing
Condition	M or L stream
Units	Feet

BarDitch_RR: In the case that cross ditches or water bars are used as sediment barriers to the crossing, record the status of the water bars or cross ditches to the river right of the stream crossing. The ditches/bars have no issues ("OK"), lack excavation into the road surface (built on the road surface, not in; "ON"), have an outlet that is not lower than the road surface ("OUT"), is not angled to direct the flow off the road ("ANG"), or exhibit vehicle tracks over them that are compromising their effectiveness (permitting flow through the bar; "TR").

Variable Name	**BarDitch_RR**
Value(s)	Blank, "OK", "ON", "OUT", "ANG", "TR"
Record for	Stream Crossing
Condition	Water bars or cross ditches used as sediment barrier

BarDitch_RL: In the case that cross ditches or water bars are used as sediment barriers to the crossing, record the status of the water bars or cross ditches to the river left of the stream crossing. The ditches/bars have no issues ("OK"), lack excavation into the road surface (built on the road surface, not in; "ON"), have an outlet that is not lower than the road surface ("OUT"), is not angled to direct the flow off the road ("ANG"), or exhibit vehicle tracks over them that are compromising their effectiveness (permitting flow through the bar; "TR").

Variable Name	**BarDitch_RL**
Value(s)	Blank, "OK", "ON", "OUT", "ANG", "TR"
Record for	Stream Crossing
Condition	Water bars or cross ditches used as sediment barrier

RoadSlope_RR: Record the slope of the road from the crossing to a point 50' up the river-right portion of the road or skid trail surface.

Variable Name	**RoadSlope_RR**
Value(s)	Integer
Record for	Stream Crossing
Units	1%

RoadSlope_RL: Record the slope of the road from the crossing to a point 50' up the river-left portion of the road or skid trail surface.

Variable Name	**RoadSlope_RL**
Value(s)	Integer
Record for	Stream Crossing
Units	1%

Issues_RR: Record issues with sediment deposition arising from conditions with the river-right road/skid trail condition. If sediment is deposited within 10' of a stream as a result of connectivity with a ditchline, record "D". If sediment is deposited within 10' of a stream as a result of delivery from a road surface (e.g., gullies in the road), record "R". If deposition is from a skid trail crossing, record "S". If no delivery issues are found record "No".

Variable Name	**Issues_RR**
Value(s)	Blank, "No", "D", "R", "S"
Record for	Stream Crossing

Issues_RL: Record issues with sediment deposition arising from conditions with the river-left road/skid trail condition. If sediment is deposited within 10' of a stream as a result of connectivity with a ditchline, record "D". If sediment is deposited within 10' of a stream as a result of delivery from a road surface (e.g., gullies in the road), record "R". If deposition is from a skid trail crossing, record "S". If no delivery issues are found record "No".

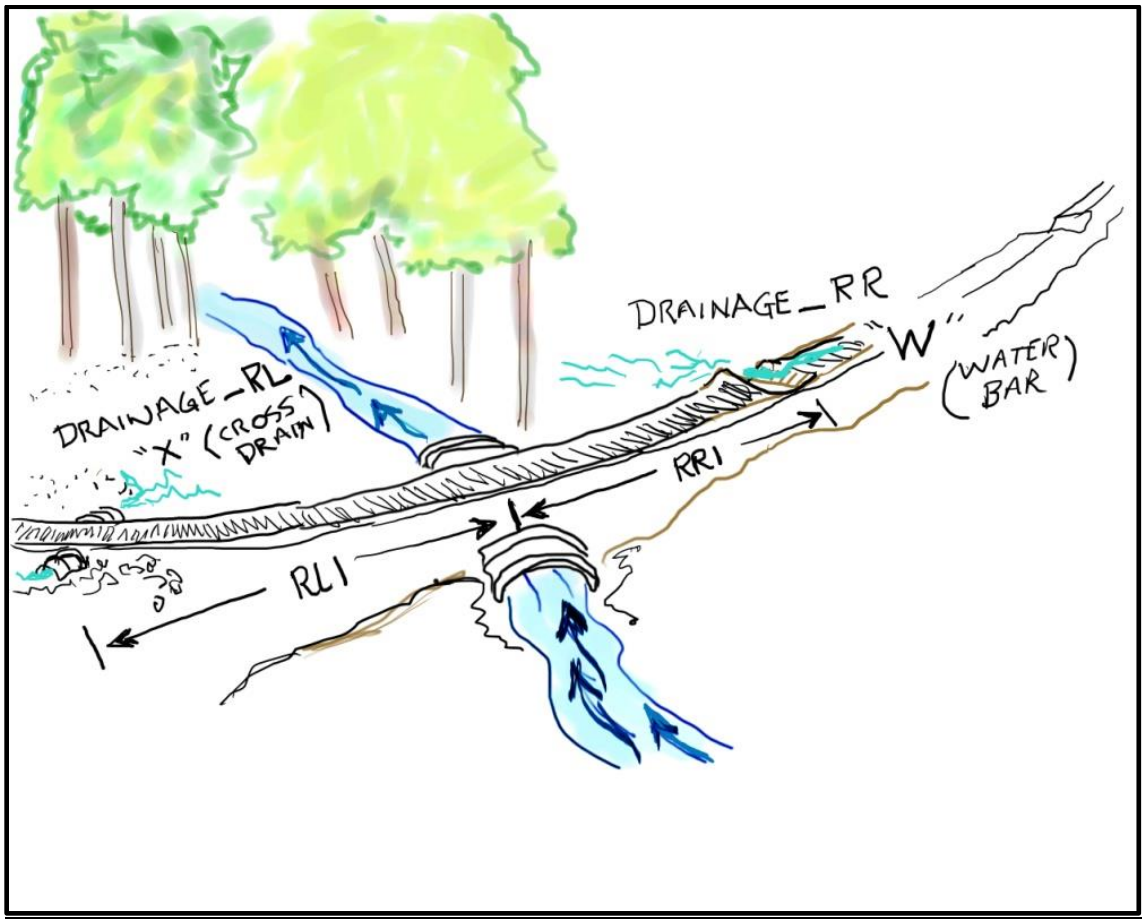
Variable Name	**Issues_RL**
Value(s)	Blank, "No", "D", "R", "S"
Record for	Stream Crossing

Issues_Fill: Record if the crossing fill has gullies in it greater than 2" wide or deep ("G"), slumps of a volume > 1 cubic yard ("S"), cracks parallel to the road surface ("C"), or if it is unarmored ("U") (unarmored slopes are those that have not had rock or other erosion resistant material applied to prevent erosion of the fill – rills or gullies in the fill indicate lack of armor). A crack in the fill would have dimensions 1 foot long or longer parallel to the road surface on or along road fill. The unarmored condition can be combined with the other issue types ("UG", "UC", "US"). This information is not applicable for temporary crossings where crossing has been removed and the fill slopes made stable. This **will** apply to temporary crossings (that may be identified as such) that were not removed, or in which the remaining slopes are equal or greater than 1:1.

Variable Name	**Issues_Fill**
Value(s)	"No", "G", "C", "S", "U" , "UG", "UC", "US"
Record for	Stream Crossing
Condition	Crossing fill present

PhotoID: Record the identifier for photographs associated with a specific condition, primarily related to WOS connectivity Issues. See photograph discussion & requirements in section 4.1.A.

Variable Name	**PhotoID**
Value(s)	Text
Record for	Stream Crossing
Condition	WOS connectivity



4.1.E. Landings and Quarries

Data collection procedure:

Review definitions of "Landing" in Definitions (Section 3).

Contractor shall collect data on the condition of all landings and quarries in the Unit. Quarries are either active (evidence of current use including machinery tracks and fresh rock piles) or inactive (lacking machinery tracks, settled rock piles, and possibly vegetated). See our definition of Landing. For each landing and quarry the Contractor will determine connectivity with WOS including location within RMAs, WOS, or unfiltered drainage leading to WOS.

One issue that may present itself more in landings than elsewhere is petroleum waste. Petroleum waste includes spilled oil, jugs containing oil residue or oil, oil filters, grease tubes, ether cans, and other similar waste. Spent containers of petroleum product are still considered petroleum waste if left within the Unit. Tannins from certain tree bark produce what appears to be a black slick on puddles and should not be confused with petroleum waste.

Multiple features may exist at a single quarry. If there is more than one Issue (see below) record separate entries for the same landing or quarry by Issue type. Record more than one entry for a landing or quarry if more than one variety of waste is encountered. Ensure that the same QL_GPS code is recorded for all entries pertaining to a single quarry or landing and use sequential Record numbers for each entry.

Data that need to be recorded and reported for each quarry and landing are listed below and compiled with example entries in the table Quarries & Landings:

DataType: This variable is recorded for all quarries and landings.

Variable Name	**DataType**
Value(s)	"Quarry_Landing"
Level	Unit

Notification: Provide the Agency notification number for all data collected within a specific harvest unit.

Variable Name	**Notification**
Value(s)	Text
Record for	Unit

Surveyors: Record the name or names of surveyors conducting the data collection on the unit in use.

Variable Name	**Surveyors**
Value(s)	Text
Record for	Unit

Date: Record the date of data collection. If data collection spans multiple days, record the date for which data collection occurred for that particular quarry or landing. Record in the format of "MM/DD/YYYY".

Variable Name	**Date**
Value(s)	MM/DD/YYYY
Record for	Unit

QL_GPS: A GPS point is recorded for each quarry and landing encountered. The GPS value from a nearby road section (SegGPS) may be used for a quarry or landing if within 100 feet.

Variable Name	**QL_GPS**
Value(s)	Text
Record for	Quarries & Landings

Record: The individual record number (starting at 1) begins here. If there are multiple entries to be made for Quarries & Landings, each entry has a subsequent Record number.

Variable Name	**Record**
Value(s)	Numeric
Record for	Quarries & Landings

QLType: Record the quarry or landing type. All landings are "L", inactive quarries are "QI", active quarries are "QA".

Variable Name	**Type**
Value(s)	"QI", "QA", "L"
Record for	Quarries & Landings

LandingHSlope: If greater than 50% slope, record the downhill native slope adjacent to the landing opon which drainage is directed or directly upon which waste (WasteType) is located. Waste is considered on the slope if it has been placed on the slope face, up to the edge of the landing, or overhanging the slope face. Hillslope measurement does not include the slope of fill.

Variable Name	**LandingHSlope**
Value(s)	Numeric
Record for	Quarries & Landings
Condition	Landing (Type="L"), waste (WasteType) on hillslope with >50% angle or landing drainage onto hillslope with > 50%.
Units	%

Issues: For quarries, record if the quarry lies within a channel ("QC"). For landings, record whether the landing lies within an RMA ("LR"), stumps/slash/logs are embedded in the landing fill ("LF"), or if the landing is located on an existing slump ("SLU") or slide ("SLI"). If the landing is or obviously was in the channel itself, determine if the channel flow direction was altered (e.g., by decking in the channel; "LCD") or if material was added to or removed from the channel to create the landing ("LCAR")

Variable Name	**Issues**
Value(s)	"LR", "QC", "LCAR", "LCD", "LF", "SLU", "SLI"
Record for	Quarries & Landings
Condition	Quarry: In channel Landing: multiple conditions

WasteLoc: Record the location of waste found in quarries and landings. See WasteType for a list of waste types of concern. Waste locations include waste from a quarry or landing that have ended up within the bankfull width of a WOS ("BFW"), in an erosion channel leading to a WOS ("CTW"), or within the quarry ("Q") or landing ("L") itself. Petroleum containers may be found to the side of a landing away from a burn pile but not on the driving surface of the landing; these items would be considered as within the landing area.

Variable Name	**WasteLoc**
Value(s)	"BFW", "CTW", "Q", "L"
Record for	Quarries & Landings

WasteType: Record the type of waste found at landings, active/inactive quarries, bankfull widths of streams leading through quarries or landings, or the erosion channels leading from the quarries/landings to WOS. Types include overburden ("OB"; top layer of material removed for road construction, may have been treated as sidecast or piled), solid waste ("SW"; rocks), and petroleum waste ("PW") including spilled oil, jugs containing oil or oil residue, oil filters, grease tubes, ether cans, and other similar waste. Other varieties include general waste from operations ("OW"), household (non-operational) waste ("HW"), and stumps from landing construction ("ST"). Types also include slash piles ("SP") and sidecast ("SI"). Solid waste (AKA: rocks) would be correctly recorded as waste for a quarry entry if it was evident that quarry rocks were entering a WOS, e.g., quarry rock placed in a stream that passed through the quarry.

Variable Name	**WasteType**
Value(s)	"OB", "SW", "PW", "OW", "HW", "ST", "SI", "SP"
Record for	Quarries & Landings

QuarryLandslide: Record the location of any landslide originating above and into the quarry ("A"), below and from the quarry ("B"), or both ("AB").

Variable Name	**QuarryLandslide**
Value(s)	"A", "B", "AB"
Record for	Quarries & Landings
Condition	Active & inactive quarries

Connectivity: Record whether a quarry and landing drains to WOS without filtering ("W"), if landing drainage is focused onto hillslopes ("H"), or if runoff disperses ("D").

Variable Name	**Connectivity**
Value(s)	"W", "H", "D"
Record for	Quarries & Landings
Condition	All quarries and landings (W & D) Landings (H)

PhotoID: Take digital photographs of connectivity issues on quarries and landings as well as representative examples of petroleum waste. It is not necessary to photograph all petroleum waste. Count them all, note them all, and take a photograph of an example.

Variable Name	**PhotoID**
Value(s)	Text
Record for	Quarries & Landings
Condition	Connectivity, Petroleum waste

Table 3 – SAMPLE DATA SHEET – WOS Section Data

Oregon Dept of Forestry 2012 **Waters of State Data**
Forest Practices Compliance Audit **Notification #**
Surveyors
Bold = always record *Italics = record if present* **Date** **Page** **of**

1	2		3	4	5	6	7	8	9	10	11	12	13	14	15
Side: RR RL			All Streams Except SN			*SN Channel*		*Veg*							
SegGPS/ record	**Seg Type**	**WOS Type**	*Stumps w/in 20'*	*Skid Dist w/in 35'*	*Cable Corridor*	*Gradient <10%*	length	*Retent 10' (y/n)*	*Slash Cover (%)*	*WOS Disturb*	*Skid Issues*	*Skid Sed. Volume*	*Xing/Road Dist*	*WP Details*	*Photo #*
			(Stumps20				Differs							Some	
			Other)				from FG							inconsistencies	

WOS Type		Cable Corridor		RoadDist		WOS Disturb				Written Plan	
LMS	**L/M/S**	Cable yard-soil	**CYS**	<50'	<50'	Slash pile channel	**SPI**	Stumps	**ST**	Harvest w/in 100'	**WP100**
F/N/D	**F/N/D**	Present-no damage	**P**			Slash w/in 10'	**SP10**	Metallic			
Wetland < 1/4 ac	**W<1/4**	Damage Repaired	**DR**	>50'	0	Slash pond	**SPO**	waste	**MW**	Road within RMA	**WP_Road**
Wetland > 1/4 ac	**W1/4**	**SkidIssues**				Slash erosion	**SE**	Road rock	**RR**	Machinery in lake	**WP_ML**
F lake < 1/2 ac	**SFL**	Straight up & connecte	**SUC**			Track/Rut	**TR**	Channelized/		Yarding Corridors in RMA	**WP_Yard**
N lake>1/2 ac	**NL**	Steep Skid Connectivity	**SSC**			Sidecast	**SI**	relocated	**CR**		
Wetland > 8 ac	**SWL**	Other connectivity		**Seg Type**				Add/remove			
All lakes	**AL**	issues	**SOTH**	Start pt	S			soil/rock	**AR**		
St. assoc. wet.	**SAW**			Junction	J						
				Terminal Point	T						

Table 4 – SAMPLE DATA SHEET – Road Stations

Oregon Dept of Forestry 2012 | **Roads Datasheet** | **Page** of

Forest Practices Compliance Audit | **Notification #**

Bold = always record | **Surveyors**

Italics = record if present | **Date** | Waste: Station & type

Underline: record if fill present | <Types: oil, other petroleum, household, other>

1	2		3	4	5	6	7	8	9	10	11	12	13	14
	Rsec		Road	Road	*SteepSdcast*	***Fill***	***Road cut***			***Flow***	***Flow***	**WOS**	**WOS**	**Photo**
GPS ID	**Type**	**RoadType**	**Hslope**	**Width**	*Fill*	***cond***	***condition***	*gullies*	*CulvertStatus*	***DirFrom***	***DirTo***	**Conn**	**Amt**	**#**
/record		(combines												
		w/ RoadUse)												

Road Type

Spur	**S (NS)**
New	**N**
Collector	**C (NC)**
Mainline	**M (NM)**
Multiple Use	**MU**

SteepSdcastFill

On slopes > 60/40	
Sidecast	S
Fill	F

Fill Cond(ition)

Present/OK	**OK**
Slumps	**SL**
Berm drainage	**BD**
slash/stumps	
/logs	**WA**
Erosion	**ER**

RSecType

Start	**S**
Junction	**J**
Termination	**T**

Gullies

None	**N**
Hill slope	**H**
Road	**R**
Fill	**F**
Ditch	**D**

Road Cut Condition

OK	**OK**
Slumps	**SL**
Erosion	**ER**

Drainage Tally

None	**N**
Grade Reversal	**G**
Sloping	**S**
Ditch	**D**
Culvert	**C**
Waterbar	**W**
Rolling dip	**R**

CulvertStatus

<type>	
Stream culvert	**S**
Ditch culvert	**D**
<Issue>	
OK	**OK**
Complete Block	**CB**
Partially blocked	**PB**

FlowDirFrom

<onto road from>	
blocked culvert	**C**
blocked x-drain	**X**
blocked ditch	**D**
wet area	**W**

FlowDirTo

unarmored	**U**
fillslope	
~~headwall~~	~~**H**~~
~~slide~~	~~**SLI**~~
~~steep&erodible~~	**S**

WOS Conn

Drain outflow	**DO**
Blocked cross-drain	**BXD**
Ditch	**DI**
Road runoff	**RR**
Berm drainage	**BD**
Fill/cut	**FC**
Oiled road runoff	**OR**
Other	**OT**
Diverted Stream	**DIV**

WOS Amt

0-1
1-10
10-100
>100

Take photo of:	**WOS connectivity**		**Culvert/cross drain damage or impedence**		**Gullies**	**Fill conditions**		**road flow**		

Table 5 – SAMPLE DATA SHEET –Stream Crossings

Oregon Dept of Forestry 2012
Forest Practices Compliance Audit

Notification #
Surveyors
Date

Stream Crossings
Data Sheet

Bold = always record
Italics = record if present

Xing GPS	Stream Type	Crossing Type	Fill length	Fill angle	*Fill depth*	Culvert width (in.) inlet	Culvert width (in.) outlet	*Temp Xing*	Drainage Feature type RR	Drainage Feature type RL	Distance to Drainage Feature RR1	Distance to Drainage Feature RR2	Distance to Drainage Feature RL1	Distance to Drainage Feature RL2	*Bar/XDitch Status* RR	*Bar/XDitch Status* RL	Road Slope RR	Road Slope RL	Issues RR	Issues RL	Issues Fill	Photo ID
& Record						PARise_in	PARise_Out															

Stream Type		CrossingType		TempXing		Drainage Feature		Bar/Ditch Status		Issues	
Large	L	New	N	X-ing not removed	XNR	Water bar	W	OK	OK	Sed deposition w/in 10' of stream from ditch	D
Medium	M	Reconstructed	R	Temp Xing fill >8'	Fill	Cross ditch	C	On road surface, not in	ON	Sed deposition w/in 10' of stream from from road	R
Small	S	Pre-harvest	P	Streamflow Alteration	SFA	other	O	Outlet not lower	OUT	Sed deposition w/in 10' of stream from skid trail	S
Fish	F	Skid trail	S	Sidecast Pond	SCP	none	N	Angled incorrectly	ANG	Gullies present in crossing fill	G
Non-fish	N			Structure Erosion	SE	cross drain	X	Compromised by tracks	TR	Fill slumping	S
Domestic	D			Temp Xing OK	OK					Fill cracking	C
Sig Wetland	W									Unarmored fillslope	UA

Table 6 – SAMPLE DATA SHEET – Quarries & Landings

Oregon Dept of Forestry 2012
Forest Practices Compliance Audit

Notification # _____ Landings & Quarries
Surveyors _____
Date _____

Bold = always record
Italics = record if present

QL_GPS /record	**QL Type**	*Landing Hslope*	*Issues*	*Waste Loc*	Waste *Type*	*Quarry Landslide*	*Connectivity*	*Photo*

Type	
Quarry-active	QA
Quarry-inactive	QI
Landing	L

WasteLoc	
In BFW	BFW
channel to WOS	CTW
In quarry	Q
On landing	L

Issues	
Landing in RMA	LR
Quarry in channel	QC
Landing in channel, material added/removed	LCAR
channel diverted	LCD
Landing fill = slash, stumps, logs	LF

Waste: Type	
Overburden	OB
Solid waste	SW
Trash-petroleum	PW
Trash-operations	OW
Trash-household	HW
Stumps	ST
Sidecast	SI
Slash pile	SP

Quarry Landslide	
Location (above, below)	A,B

Connectivity	
WOS	W
Hillslope	H
Disperses	D

SECTION 5. DATA SUBMISSION

Sample data collection sheets are provided in Tables 3-6 for illustration purposes only

Contractors may wish to contrive any suitable method for capturing data in the field; the contractor's strategy should be reflected in the Project Work Plan.

For submittal to ODF, data will be submitted to ODF electronically as specified in the Communications Plan portion of the Project Work Plan.

The data specifications as listed in the following tables 7-10 provide, for each data type, an example entry (Example), the variety of entry (categorical, text), values that are entered (integer, specific list of categories, text), the general data type the entry corresponds with (e.g., Unit, Stream Crossing), conditions that trigger recording a specific data entry, and data recording units (feet, percent).

The tables below list the codes for entry of various types of data. The Contractors Communication Plan should include the use of the codes listed for each of the various data types.

Table 7

Waters of State Data Specifications

		DataType	Notification	Surveyors	Date	Side	SegGPS	Record	SegType	WOSType	Stumps20	Stumps20_ other	Skid35
	Example	"WOS"	2010332003411	"Jason James"	"03/21/2013 "	"RL"	"3SN12"	1	"J"	"SN"	4	2	34
Data Entry Values and Conditions	Entry	Categorical	Numeric	Text	Text	Categorical	Text	Numeric	Categorical	Categorical	Numeric	Numeric	Numeric
	Value(s)	"WOS"	Integer	Text	MM/DD/YYYY	"RR", "RL"	Text	Integer	"S", "J", "T"	"LF", "MF", "SF", "LN", "MN", "SN", "LD", "MD", "SD", "W<1/4", "W1/4", "SFL", "NL", "SWL", "AL"	Numeric (tally)	Numeric (tally)	Distance
	Record for	Unit	Unit	Unit	Unit	WOS Section	WOS Section	WOS Section	WOS Section	WOS Section	WOS Section	WOS Section	WOS Section
	Condition					Type F/D and L/M N streams					All streams but SN	All streams but SN, in cable corridors or felled tree remains	F, D streams. Record for all skid trails within 35' of bankfull width
	Units												Feet

Table 7 (Continued)

Waters of State Data Specifications

		Cable Corridor	SN_Grad	Veg10		SlashCover	WosDisturb	SkidIssues	SkidSedVol	RoadDist	WrittenPlan	WOS_Photo
	Example	"DR"	"<10%"	"Y"		25	"TR"	"SUC"	"0-1"	">50' "	"WP100"	"Pic213"
Data Entry Values and Conditions	Entry	Categorical	Categorical	Categorical		Numeric	Categorical	Categorical	Categorical	Categorical	Categorical	Text
	Value(s)	"CYS", "P", "DR"	"< 10%", "> 10%"	"Y", "N"		0 to 100	"SPI", "SP10", "SPO", "SE", "TR", "SI", , "ST", "MW", "RR", "CR", "AR"	"SUC", SSC", "SOTH"	"0-1", "1-10", "10-100", ">100"	"<50' "" ">50' = "0"	"WP100", "WP_roads", "WP_ML", WP_Yard	Text
	Record for	WOS Section	WOS Section	WOS Section		WOS Section	WOS Section	WOS Section	WOS Section	WOS Section	WOS Section	WOS Section
	Condition	Record if cable corridor through RMA is present. All streams except SN.	SN	Perennial SN in regions specified in FPA Table 5 (Page 51); regions in Figure 1 (Page 48). Does not apply to cable corridors or crossings.		SN channel < 10% gradient	Streams: CR, AR, SPO, SE, SP10 All: MW, SI, ST, SPI, RR, TR	Skid trail connected to WOS	Any WOS	All WOS	WP100: F/D; WP_roads: F, D, L/M N, SWL; WP_ML: AL	WOS connectivity, vehicle tracks
	Units					5% increments				Feet		

Table 8

Roads Section Data Specifications

		DataType	Notification	Surveyors	Date	SecGPS	Record	RSecType	RoadType	RoadUse	RoadH Slope	RoadWidth
	Example	**"ROAD"**	**201033200 3411**	**"Jason James"**	**"03/21/2013"**	**"R1C"**	**1**	**“T”**	**"NC"**	**"MU"**	**18%**	**13**
Data Entry Values and Conditions	Entry	Categorical	Numeric	Text	Text or date/time	Text	Numeric	Categorical	Categorical	Categorical	Numeric	Numeric
	Value(s)	"ROAD"	Integer	Text	MM/DD/YYYY	Text	Integer	“S”, “J”, “T”	"M", "C", "S", "NM", "NC", "NS"	"F", "MU"	Integer	Integer
	Record for	Unit	Unit	Unit	Unit	Roads Section	Roads Section	Roads Section	Roads Section	Roads Section	Roads Section	Roads Section
	Condition											
	Units										%	Feet
	Allowable Error										10%	+/- 2 feet

Table 8 (Continued)

Roads Section Data Specifications

		SteepSdcastFill	FillCond	RoadCut Cond	Gullies	Culvert Status	FlowDirFrom	FlowDirTo	WOS_Conn	WOS_ AmtDeliv	PhotoID
	Example	**SI**	**"CR"**	**"ER"**	**"R"**	**"D-OK"**		**"U"**	**"BXD"**	**"0-1"**	**"Pic112"**
Data Entry Values and Conditions	Entry	Categorical	Categorical	Categorical	Categorical	Categorical	Categorical	Categorical	Categorical	Categorical	Text
	Value(s)	SI, F	"OK", "SL", " BD", "WA", "ER"	"OK", "SL", "ER"	"H", "R", "F", "D"	"S-OK", "S-PB", "S-CB", "D-OK", "D-PB", "D-CB"	C, "X", "D", "W	", U"	DO, "BXD", "DI", "RR", "BD", "FC", "OR", OT, DIV	"0-1", "1-10", "10-100", ">100"	Text
	Record for	Roads Section	Roads Section	Roads Section	Roads Section	Roads Section	Roads Section	Roads Section	Roads Section	Roads Section	Roads Section
	Condition		Fill Present	Road cut present	Record when gullies present	Record when culverts present	Flow directed onto road	Flow directed off road to unarmored fillslope	WOS connectivity detected	Delivery of sediment to WOS	WOS connectivity
	Units										
	Allowable Error										

Table 9

Stream Crossing Data Specifications

		DataType	Notification	Surveyors	Date	XingGPS	Record	Stream Type	Crossing Type	FillL ength	FillAngle	FillDepth	Culvert Width_In	PARise _In	CulvertWi dth _Out	PARise_ Out	Temp Xing
	Example	**" Stream Crossing"**	**201033200 3411**	**"Jason Frank"**	**"03/21/ 2013"**	**"R1C"**	**1**	**"SF"**	**"S"**	**8**	**60%**	**8**	**32**	**18**	**28**	**18**	**"XNR"**
Data Entry Values and Conditions	Entry	Categori cal	Numeric	Text	Text or Date/ Time	Text	Numeric	Categori cal	Categori cal	Numeric	Numeric	Numeric	Numeric	Numeric	Numeric	Numeric	Categori cal
	Value(s)	"Stream Crossing"	Integer	Text	MM/DD/ YYYY	Text	Integer	LN, "LD", "LF", "MN", "MD", "MF", "SN", "SD", "SF", "SWL"	"N", "R", "P", "S"	Integer	Integer	Integer	Integer	Integer	Integer	Integer	"SFA", "SCP", "XNR", "OK", "SE", "Fill"
	Record for	Unit	Unit	Unit	Unit	Stream Crossings	WOS Section	Stream Crossings	Stream Crossings	Stream Crossings	Stream Crossings	Stream Crossings	Stream Crossings	Stream Crossings	Stream Crossings	Stream Crossings	Stream Crossings
	Condition									Crossing fill present	Crossing fill present	Crossing fill present		Record for pipe arch culverts		Record for pipe arch culverts	
	Units									Feet	%	Feet	Inches		Inches		

Table 9 (Continued)

Stream Crossing Data Specifications

		Drainage _RR	Drainage _RL	RR1	RR2	RL1	RL2	BarDitch_ RR	BarDitch_ RL	RoadSlope_ RR	Road Slope_RL	Issues_RR	Issues_RL	Issues_Fill
	Example	**"W"**	**"W"**	**18**	**52**	**15**	**44**	**"OUT"**	**"TR"**	**12%**	**8%**	**"No"**	**"D"**	**"G"**
Data Entry Values and Conditions	Entry	Categorical	Categorical	Numeric	Numeric	Numeric	Numeric	Categorical	Categorical	Numeric	Numeric	Categorical	Categorical	Categorical
	Value(s)	Blank, "W", "C", "O", "N", "X"	Blank, "W", "C", "O", "N", "X"	Integer	Integer	Integer	Integer	Blank "OK", "ON", "OUT", "ANG", "TR"	Blank "OK", "ON", "OUT", "ANG", "TR"	Integer	Integer	Blank, "D", "R", "S"	Blank, "D", "R", "S"	Blank, "G", "C", "S", "U", "UG", "US", "UC"
	Record for	Stream Crossings	Stream Crossings	Stream Crossings	Stream Crossings	Stream Crossings	Stream Crossings	Stream Crossings	Stream Crossings	Stream Crossings	Stream Crossings	Stream Crossings	Stream Crossings	Stream Crossings
	Condition				M or L streams		M or L streams	Water bars or cross ditches used as sediment barrier	Water bars or cross ditches used as sediment barrier					
	Units			Feet	Feet	Feet	Feet			%	%			

Table 10 – Data Specifications

	DataType	Notification	Surveyors	Date	QL_GPS	Record	QLType	Landing HSlope
Example	**"Quarry_Landing"**	**2010332003411**	**"Jason James"**	**"03/21/2013"**	**"Q12"**	**1**	**"QA"**	**18%**
Entry	Categorical	Numeric	Text	Text	Text	Numeric	Categorical	Numeric
Value(s)	"Quarry_Landing"	Integer	Text	MM/DD/YYYY	Text	Integer	"QA", "QI", "L"	Integer
Record for	Unit	Unit	Unit	Unit	Quarries & Landings	WOS Section	Quarries & Landings	Quarries & Landings
Condition								Landing (Type="L"), waste (WasteType) on hillslope with >50% angle or landing drainage onto hillslope with > 50%.
Units								%

		Issues	WasteLoc	WasteType	QuarryLandslide	Connectivity	PhotoID
	Example	"LCAR"	"BFW"	"SW"	"A"	"H"	"Pic112"
Data Entry Values and Conditions	Entry	Categorical	Categorical	Categorical	Categorical	Categorical	Text
	Value(s)	"LR", "QC", "LCAR", "LCD", "LF"	"BFW", "CTW", "Q", "L"	"OB", "SW", "PW", "OW", "HW", "SI", "SP", "ST"	"A", "B", "AB"	"W", "H", "D"	Text
	Record for	Quarries & Landings	Quarries & Landings	Quarries & Landings	Quarries & Landings	Quarries & Landings	Quarries & Landings
	Condition	Quarry: "QC" Landings: all other issue codes			Active & inactive quarries	All quarries and landings (W & D); Landings (H)	Connectivity, petroleum waste
	Units	%					

SECTION 6. UNIT DATA QUALITY REVIEW

Observed data submitted to agency by Contractor must meet specified minimum standards for measurements of presence/absence, length, width, depth, slope, culvert diameter, classification of drainage features, types of road use, hydrologic connectivity, volume and other general data.

Unit Data Packages should be submitted with an identifying element, as in a cover sheet or label. The Data Package identity should include the date submitted, a tracking code (alphanumeric) and a list of the units contained in the package. The method of identifying individual Unit Data Packages should be used consistently for the duration of the contract.

When the Contractor submits a Unit Data Package, the Contract Administrator will select one of the ten units from the Package for review. The **Unit Data Quality Review Interval** ("review interval") will begin.

The ODF will visit the sample site and check the work of the Contractor, and compare the results to the Data Standards listed in Tables 10-13.

If the Unit Data Quality Review determines that the data meets the standards, ODF will notify the Contractor of the acceptance of the Unit Data Package. Contractor may then include the units in the Data Package in a Unit Payment Package.

Data submitted by Contractor that does not meet the Data Standards will be reported to Contractor within five (5) business days of the inspection.

If the data submitted by the Contractor does not meet the Data Standards, the Unit Data Package will be returned to the Contractor.

Contractor will revisit sites within the Unit Data Package as necessary to make corrections as needed to meet Unit Data Standards, and re-submit data sets to for additional review at no cost to the Agency.

Upon receipt of re-submitted Unit Data Package, the Contract Administrator will select a second site for evaluation, visit the site and replicate the work of the Contractor.

If the second Unit Data Quality Review determines that the Unit Data meets the Data Standards, ODF will notify the Contractor of the acceptance of the Unit Data Package. Contractor may then include the units in the Data Package in a Unit Payment Package.

If the data in the re-submitted Data Package does not meet the Data Standards, the Unit Data Package will be returned to the Contractor and ODF will schedule a meeting with the Contractor to assess future of the project.

Agency shall pay Contractor only for those Units for which data submitted meets criteria for precision and accuracy described in the Unit Data Quality Review process.

Figure 4 – Agency Inspection and Certification of Contractor Work

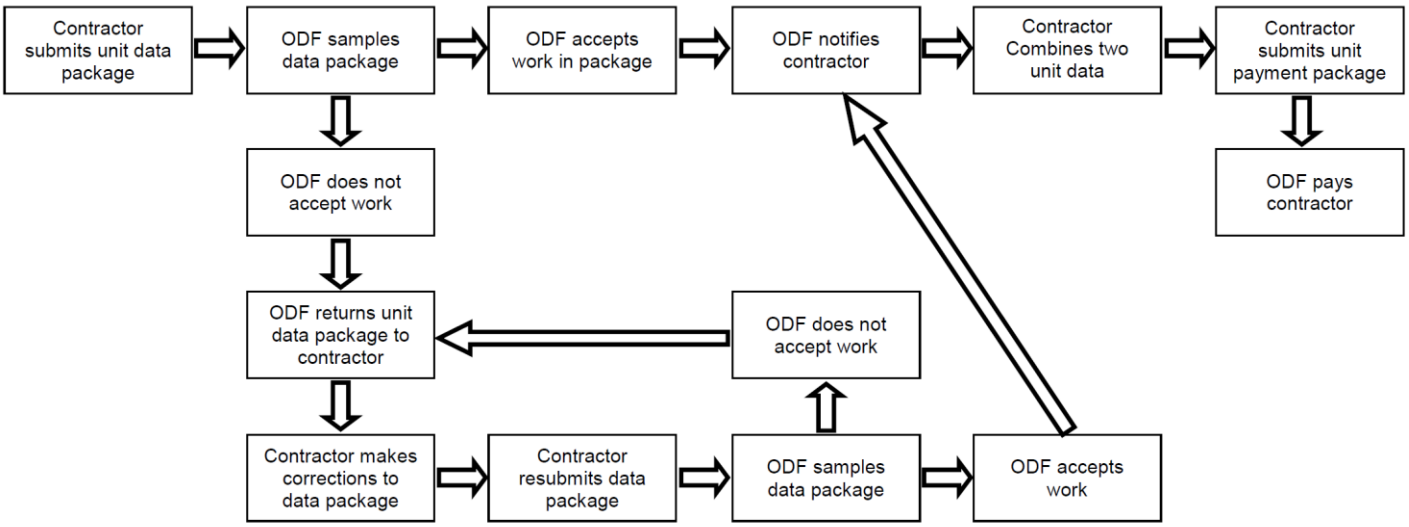


Table 11

Oregon Forest Practices Audit WOS DATA STANDARDS			
Data Types - Stream Channels		**Data Criteria**	**Required Accuracy / Precision**
A	Streams	Water Classification: Stream type, etc.	90 % per unit correctly identified
B	Streams	Stumps w/in 20' Type F/D. Ccable corridor calls	95% of stumps meeting criteria are identified per unit. One cable corridor omitted per unit allowed.
B	Streams	Stream channel segment: Length & Gradient	All slopes measured @ <10% within 5%; all segment length calls within 20'.
D	Streams	Presence / Absence of Vegetation Retention within 10 feet of Type F / D stream	Presence / Absence 90% within unit correct. Distance measures +/- 2 feet per unit.
E	Streams	Presence / Absence of skidding within 35' of stream.	Presence / Absence 90% within unit correct. Distance measures +/- 5 feet per unit.
F	Streams	Slash pile within 10 ft of Type F/D presence / absence.	Presence / Absence 90% within unit correct. Distance measures +/- 3 feet per unit.
G	Streams	Slash in streams: presence / absence.	Presence / Absence 80% within unit correct.
H	Streams	Stream channel disturbance: presence / absence / Type	95% correct within each unit.
I	Streams	Skidding through channel: presence / absence.	Essential Data - No pemissable error.
J	Streams	Stream Crossings: Distance to drainage structure.	95 % correct to +/- 5 feet distance per unit

Table 12

ODF Forest Practices Audit ROADS DATA STANDARDS		
Roads Data Topic		**Required Accuracy / Precision**
A	Road Presence / Absence	95 % of observations per unit must be true.
B	Road segment GPS point types are incorrectly identified or missing	<10% of sections per unit with missing/misidentified points
C	RoadType -- Size	< 20% of sections incorrectly recorded
D	RoadType – New, Reconstructed or pre existing.	Two sections may be misidentified
E	RoadUse – Multiple Use or Forestry Only	<5 stations misrecorded
F	Road Hill Slope incorrect † (see notes below)	< 5% of measurements per unit incorrect
G	Road width measurement is > 2 feet in error	<10% of measurements incorrect
H	FillAngle or FlowHSlope Angle ‡	< 5 % of measurements in error per unit
I	Sidecast: presence / absence	Steep :(granitic>35%, non-granitic>55%) < 5% error on unit. Not Steep: (Granitic < 35%, non-granitic <55%) ,10% error on unit
J	Fill Condition is misclassified	<5% misclassified or missed FillCond item
K	RoadCutCondition or Gullies	<5% misclassified or undetected sections
L	FillCond, RoadCutCond, Gullies, Flow Directed From – connected to Waters of State	Essential data - no passable threshold
M	Culvert – stream crossing: Presence / absence	Essential data - no passable threshold- no missed or misidentified stream culverts
N	Ditch / culvert are misidentified	<5% of missed road culverts permitted
O	Culvert Status: Culvert status is incorrectly recorded	<5% incorrectly classified culverts
P	Road Runoff Flow Directed From is missed or misidentified within a segment	<10% FlowDirFrom misclassification
Q	Road Runoff Flow Directed To is missed or misidentified	95% correctly identified
R	Waters of State Connectivity misidentified	No passable threshold
S	Waters of State amount of sediment deposition – an estimate	Cubic Yards : (0-1, 1-10, 10-100, > 100) : off by one category
T	Section length	Except for shorter sections due to detected issues or road termination, 30' error permissible for < 20% of sections
U	PhotoID: photo not taken when delivery/petroleum issue detected	One missed photo allowed per unit

†Non-granitic soils: if slope less than 40%, may record anything less than 40%.

Between 40 and 50%, error may be +/-10%.

Granitic soils: if slope less than 20%, may record anything less than 20%.

Between 20 and 30% error may be +/- 10%.

Between 30 and 50% error may be +/- 5%.

Greater than 50% error may be +/- 10%.

Between 50 and 70%, error may be +/- 5%. Greater than 70% error may be +/- 10%.

‡ If fill slopes less than 70%, may record anything less than 70%. At 70% and greater the error may be +/- 10%.

Table 13

ODF Forest Practices Audit STREAM CROSSINGS DATA STANDARDS			
Data Types – Stream Crossings		**Data Quality Criteria**	**Required Accuracy / Precision**
A	Stream Crossing	Presence / Absence Proper Identification	95% of observations per unit must be true.
B	Stream Crossings	Riparian segments with missing/ wrong Stream type	<10% of segments may be in error
C	Stream Crossings	fill length	No Fill Length calls off by more than 3' (if total fill length <= 30'), or off by more than 8' (total fill length >30')
D	Stream Crossings	Fill Angle	No Fill Angle calls off by more than 10%
E	Stream Crossings	Fill Depth	< 10% Fill Depth calls off by more than 2 feet
F	Stream Crossings	Temp crossings Drainage Feature Type	No more than 3 entry omitted or falsely entered per Unit
G	Stream Crossings	Stream crossing Issues	< 5% omitted or falsely entered per Unit
H	Stream Crossings	stream crossings culvert diameter	All calls within 2"
I	Stream Crossings	Temp crossings with incorrect Dist to Drainage Feature calls	All calls within 5 feet of ODF-measured values
J	Stream Crossings	Bar/Xditch Status misclassified.	80 % of all observations must be true.
K	Stream Crossings	Road slope measurement	All calls within 5% of ODF-measured slope
L	Stream Crossings	PhotoID: photo not taken when delivery/petroleum issue detected	One missed photo allowed per unit

Table 14

ODF Forest Practices Audit LANDINGS AND QUARRIES DATA STANDARDS			
	Data Types	**Data Quality Criteria**	**Required Accuracy / Precision**
A	Landings/Quarries	Landing :Presence / Absence	90% of landings must be identified (not missed) and correctly identified (true landings)
B	Landings/Quarries	Landings/quarries slope of hillside.	90 % of measurements within 90%
C	Landings/Quarries	Classifications of Landings/Quarries	90 % correct
D	Landings/Quarries	Issues at Landings/quarries; Presence / absence.	95 % correct
E	Landings/Quarries	Waste at landings & quarries : location	90% correct
F	Landings/Quarries	Waste at Landings/quarries Classification of type. (One Photo/landing o.k.)	90% correct
G	Landings/Quarries	Landslide associated with Landings / Quarries:	95% correct
H	Landings/Quarries	Drainage at Landings/Quarries – Connectivity to Waters of State	95% correct.
J	Landings/Quarries	Landings/quarries in RMA with WP details misclassified/missing	Up to 15% not noted
K	Landings/ Quarries	Photographs : Included as required.	90 % correct

SECTION 7. UNIT PAYMENT PACKAGE SUBMITTAL

Unit Payment Packages should be submitted with an identifying element, as in a cover sheet or label. The Payment Package identity should include the date submitted, a tracking code (alphanumeric) and a list of the units contained in the package. The method of identifying individual Unit Payment Packages should be used consistently for the duration of the contract.

An invoice should accompany the Unit Payment Package.

Upon receipt of a Unit Payment Package, the Agency Administrator will forward the invoice, with approval for payment, to the ODF Finance Section.

Payment to Contractor will then be made according to Administrative Rule requirements.

Table 15

OREGON DEPARTMENT OF FORESTRY - PRIVATE FORESTS PROGRAM

2012 - 2013 Forest Practices Compliance Audit

Unit Tracking Sheet

Notification Number ( )	Unit Office ( )	Stewardship Forester ( )	Contact Phone ( )	E-mail ( )	Landowner Permission ( )	Work Plan Visit Week ( )	ODF Contacted ( )	Date of Visit ( )	Data Submitted ( )	Data Checked ( )	Unit Billed ( )	Unit Paid ( )

Section 8. List of Agency Offices, Contact Information, Maps

OREGON DEPARTMENT OF FORESTRY OFFICES

Eastern Oregon Area

OFFICE	PHONE	FAX
Eastern Oregon Area PO Box 670 3501 E Third Street Prineville, OR 97754	(541) 447-5658	(541) 447-1469
Central Oregon District PO Box 670 3501 E Third Street Prineville, OR 97754	(541) 447-5658	(541) 447-1469
The Dalles Unit 3701 W 13th The Dalles, OR 97058	(541) 296-4626	(541) 298-4993
Prineville Unit PO Box 670 3501 E Third Street Prineville, OR 97754	(541) 447-5658	(541) 447-1469
Sisters Sub-Unit 16721 Pine Tree Lane Sisters, OR 97759	(541) 549-2731	(541) 549-9422
John Day Unit 415 Patterson Bridge Road P.O. Box 546 John Day, OR 97845	(541) 575-1139	(541) 575-2253
Fossil Sub-Unit 45945 Hwy 10 Fossil, OR 97830	(541) 763-2575	(541) 763-2027
Klamath/Lake District Office 3200 DeLap Road Klamath Falls, OR 97601	(541) 883-5681	(541) 883-5555
Klamath Unit 3200 DeLap Road Klamath Falls, OR 97601	(541) 883-5681	(541) 883-5555
Lakeview Unit 2290 North 4th Street Lakeview, OR 97630	(541) 947-3311	(541) 947-3078

Northeast Oregon District Office 611 20th Street La Grande, OR 97850	(541) 963-3168	(541) 962-1058

OFFICE	PHONE	FAX
La Grande Unit 611 20th Street La Grande, OR 97850 (541) 962-1058	(541) 963-3168	
Baker City Sub-Unit 2995 Hughes Lane Baker City, OR 97814	(541) 523-5831	(541) 523-5874
Pendleton Unit 1055 Airport Road Pendleton, OR 97801	(541) 276-3491	(541) 276-0710
Wallowa Unit 802 W. Hwy. 82 Wallowa, OR 97885	(541) 886-2881	(541) 886-9085

Northwest Oregon Area

OFFICE	PHONE	FAX
Northwest Oregon Area 801 Gales Creek Road Forest Grove, OR 97116-1	(503) 359-7426	(503) 359-9514
Astoria District 92219 HWY 202 Astoria, OR 97103	(503) 325-5451	(503) 325-2756
North Cascade District 22965 North Fork Road SE Lyons, OR 97358	(503) 859-2151	(503) 859-2158
Molalla Unit 14995 S Hwy 211 Molalla, OR 97038-8441	(503) 829-2216	(503) 829-4736
Santiam Unit 22965 North Fork Road SE Lyons, OR 97358	(503) 859-2151	(503) 859-2158
Forest Grove District 801 Gales Creek Road Forest Grove, OR 97116	(503) 357-2191	(503) 357-4548

Columbia City Unit 405 E Street Columbia City, OR 97018	(503) 397-2636	(503) 397-6361

OFFICE	PHONE	FAX
Tillamook District 5005 3rd Street Tillamook, OR 97141-2999	(503) 842-2545	(503) 842-3143
West Oregon District - Philomath 24533 Alsea HWY Philomath, OR 97370	(541) 929-3266	(541) 929-5549
Dallas Unit 825 Oak Villa Road Dallas, OR 97338	(503) 623-8146	(503) 623-9034
Toledo Unit 763 NW Forestry Road Toledo, OR 97391	(541) 336-2273	(541) 336-5261

Southern Oregon Area

OFFICE	PHONE	FAX
Southern Oregon Area 1758 NE Airport Road Roseburg, OR 97470-1499	(541) 440-3412	(541) 440-3419
Coos District 63612 Fifth Rd Coos Bay, OR 97420	(541) 267-4136	(541) 269-2027
Gold Beach Unit PO Bos 603 Gold Beach, OR 97444	(541) 247-6241	none
Roseburg Unit 1758 NE Airport Road Roseburg, OR 97470-1499	(541) 440-3412	(541) 440-3424
South Cascade District 3150 Main Street Springfield, OR 97478	(541) 726-3588	(541) 726-2501
Eastern Lane Unit 3150 Main Street Springfield, OR 97478	(541) 726-3588	(541) 726-2501
Sweet Home Unit 4690 HWY 20 Sweet Home, OR 97386	(541) 367-6108	(541) 367-5613

OFFICE	PHONE	FAX
Southwest Oregon District 5286 Table Rock Road Central Point, OR 97502	(541) 664-3328	(541) 664-4340
Grants Pass Unit 5375 Monument Drive Grants Pass, OR 97526	(541) 474-3152	(541) 474-3158
Medford Unit 5286 Table Rock Road Central Point, OR 97502	(541) 664-3328	(541) 664-4340
Western Lane District 87950 Territorial HWY Veneta, OR 97487-0157	(541) 935-2283	(541) 935-0731
Florence Unit 2660 Kingwood Street Florence, OR 97439	(541) 997-8713	(541) 997-3737

Table 16 – Contact Information – Stewardship Foresters

AREA	DISTRICT/ ASSOC	Unit	Name	Office Phone	E-Mail
EOA	Central OR	Prineville	OTTO Stu A	541-447-5658x232	SOTTO@ODF.STATE.OR.US
EOA	Central OR	Prineville	WARD Elden	541-447-5658x235	EWARD@ODF.STATE.OR.US
EOA	Central OR	Prineville	ZIMMERLEE, Boone	541-447-5658x	BZIMMERLEE@ODF.STATE.OR.US
EOA	Central OR	The Dalles	BEHLING Chet	541-296-4626	CBEHLING@ODF.STATE.OR.US
EOA	Central OR	John Day	AUSLAND Kirk	541-575-1139x230	KAUSLAND@ODF.STATE.OR.US
EOA	Central OR	John Day	MUND Mitchell M	503-575-1139x231	MMUND@ODF.STATE.OR.US
EOA	Klamath/Lake	Klamath	MALONEY Anne	541-883-5681	AMALONEY@ODF.STATE.OR.US
EOA	Klamath/Lake	Klamath	CANTRELL, Sarah	541-883-5681	SBCANTRELL@ODF.STATE.OR.US
EOA	Klamath/Lake	Lake	CARLSEN Kellie L	541-947-3311	KACARLSEN@ODF.STATE.OR.US
EOA	Klamath/Lake	Klamath	BRUSH Jason A	541-883-5681	JBRUSH@ODF.STATE.OR.US
EOA	Northeast OR	Pendleton	RUDOLF Hans	541-276-3491	HRUDOLF@ODF.STATE.OR.US
EOA	Northeast OR	La Grande	WAGNER, Rick	541-963-3168	RWAGNER@ODF.STATE.OR.US
EOA	Northeast OR	Wallowa	MEYER Steve	541-886-2881	SMEYER@ODF.STATE.OR.US
EOA	Northeast OR	Baker City Sub-Unit	McCRAE Logan	541-523-5831	LMCCRAE@ODF.STATE.OR.US
NWOA	Forest Grove	Forest Grove	ONION Brent	503-359-7442	BONION@ODF.STATE.OR.US
NWOA	Forest Grove	Forest Grove	AGALZOFF Nathan V	503-359-7461	NAGALZOFF@ODF.STATE.OR.US
NWOA	Astoria	Astoria	LERTORA Ashley M	503-325-5451	ALERTORA@ODF.STATE.OR.US
NWOA	Astoria/ Tillamook	Astoria	MCCOY Jason		JMCCOY@ODF.STATE.OR.US
NWOA	Forest Grove	Columbia City	KRAUSE John E	503-397-2636	JKRAUSE@ODF.STATE.OR.US
NWOA	Forest Grove	Columbia City	REED Mark R	503-397-2636	MREED@ODF.STATE.OR.US
NWOA	Forest Grove	Forest Grove	NELSON Kevin	503-359-7493	KNELSON1@ODF.STATE.OR.US
NWOA	North Cascade	Santiam	WEST, Scott	503-859-4343	SWEST@ODF.STATE.OR.US
NWOA	North Cascade	Molalla	WHITTINGTON, Thomas	503-829-2216	TWHITTINGTON@ODF.STATE.OR.US
NWOA	North Cascade	Molalla	HAASKEN Mike A	503-829-2216	MHAASKEN@ODF.STATE.OR.US
NWOA	North Cascade	Molalla	HEPLER Jeff D	503-829-2216	JHEPLER@ODF.STATE.OR.US
NWOA	North Cascade	Santiam	BALDWIN Keith D	503-859-4324	KBALDWIN@ODF.STATE.OR.US
NWOA	Tillamook	Tillamook	MAIN Mark R	503-815-7052	MMAIN@ODF.STATE.OR.US
NWOA	West Oregon	Philomath	MAHR Bill S	541-929-9160	BMAHR@ODF.STATE.OR.US
NWOA	West Oregon	Dallas	THOMPSON Dave K	503-623-8146	DKTHOMPSON@ODF.STATE.OR.US
NWOA	West Oregon	Dallas	ERDMANNN, Jennifer	503-623-8146	JERDMANN@ODF.STATE.OR.US
NWOA	West Oregon	Toledo	SIEVERS, Scott	541-336-2273	SSIEVERS@ODF.STATE.OR.US
NWOA	West Oregon	Toledo	HITSELBERGER, Joe	541-336-2273	JHITSELBERGER@ODF.STATE.OR.US
NWOA	West Oregon	Dallas	RHEA Jennifer	503-623-8146	JREHA@ODF.STATE.OR.US
SOA	Western Lane	Florence	HALL James L	541-997-8713	JHALL@ODF.STATE.OR.US
SOA	Western Lane	Veneta	MENK, Dan	541-935-2283	DMENK@ODF.STATE.OR.US
SOA	Western Lane	Veneta	PETERSON, Brian	541-935-2283	BPETERSON@ODF.STATE.OR.US
SOA	Western Lane	Veneta	BIESECKER Robin	541-935-2283	RBIESECKER@ODF.STATE.OR.US
SOA	Coos	Coos Bay	HOGAN Mike A	541-267-1749	MHOGAN@ODF.STATE.OR.US
SOA	Coos	Coos Bay			
SOA	Coos	Coos Bay	MORRIS Nick	541-267-1747	NMORRIS@ODF.STATE.OR.US
SOA	Coos	Gold Beach	SAVONA, Stacy	541-469-5040	SSAVONA@ODF.STATE.OR.US
SOA	Coos	Coos Bay	DEVINE Delos G	541-267-1750	DDEVINE@ODF.STATE.OR.US
SOA	SOA Office	Roseburg Unit	DEWEY Mike	541-440-3412	MDEWEY@ODF.STATE.OR.US
SOA	SOA Office	Roseburg Unit	MOREY, Jay	541-440-3412	JAY.C.MOREY@ODF.STATE.OR.US
	SOA Office	Roseburg Unit	WALTERS, Jay	541-440-3412	
SOA	SOA Office	Roseburg Unit	WALDRON Keith	541-440-3412	KWALDRON@ODF.STATE.OR.US
SOA	South Cascade	Eastern Lane/ Springfield	VETTER Marvin J	541-726-3588	MVETTER@ODF.STATE.OR.US
SOA	South Cascade	Sweet Home	EWING James	541-367-6108	JEWING@ODF.STATE.OR.US
SOA	South Cascade	Eastern Lane/ Springfield	MEEHAN Tim R	541-726-3588	TMEEHAN@ODF.STATE.OR.US
SOA	South Cascade	Sweet Home	KENDALL Steve	541-367-6108	SKENDALL@ODF.STATE.OR.US
SOA	Southwest OR	Medford	MARCU Bob L	541-664-3328	BMARCU@ODF.STATE.OR.US
SOA	Southwest OR	Medford	WINSLOW Lee C	541-664-3328	LWINSLOW@ODF.STATE.OR.US
SOA	Southwest OR	Grants Pass	SCHULTZ Tyson	541-471-4244	TSCHULTZ@ODF.STATE.OR.US
SOA	Southwest OR	Grants Pass	WETMORE Stephen K	541-471-4253	SWETMORE@ODF.STATE.OR.US
		Prineville	Miller, Ryan		

Figure 5

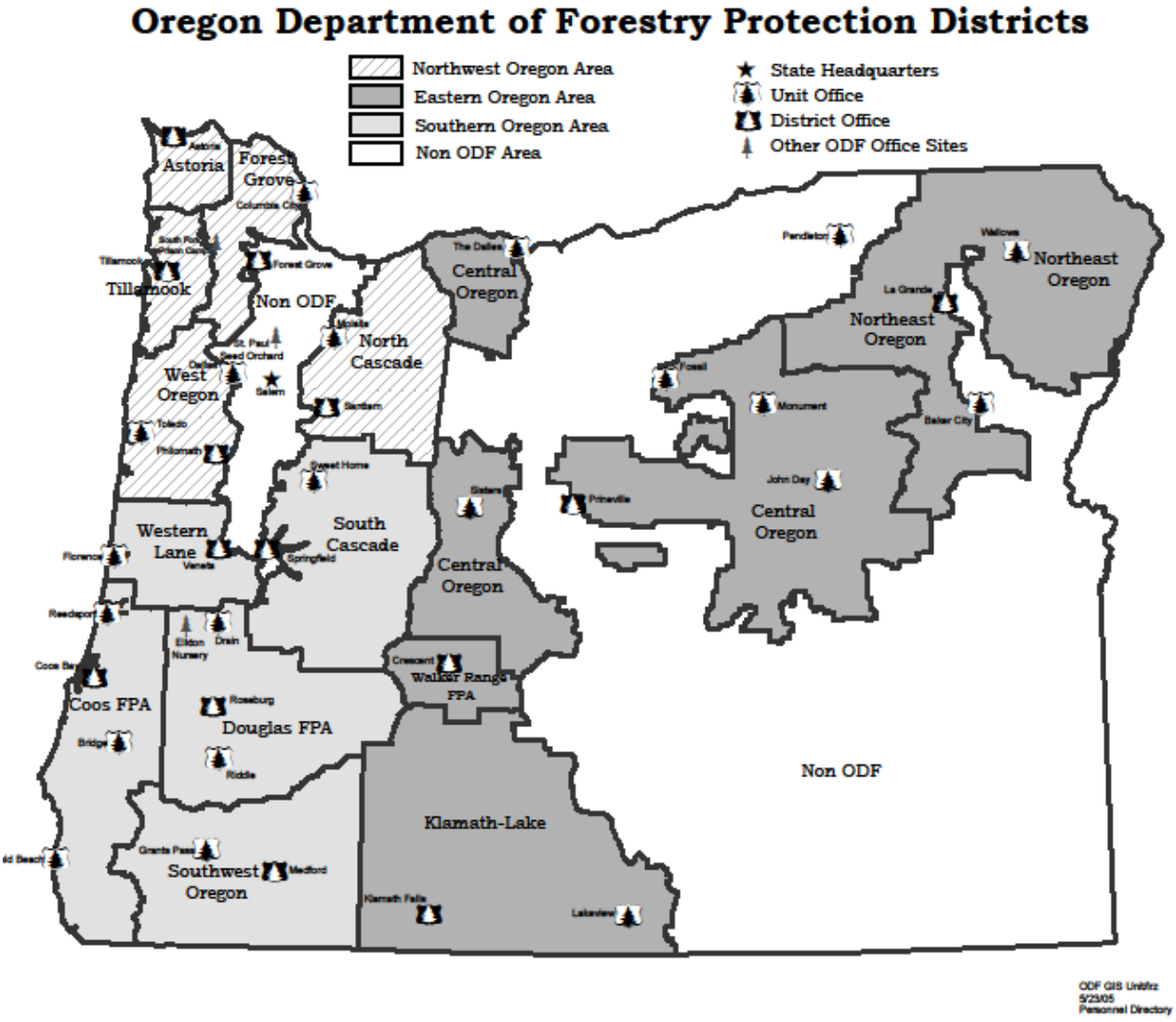
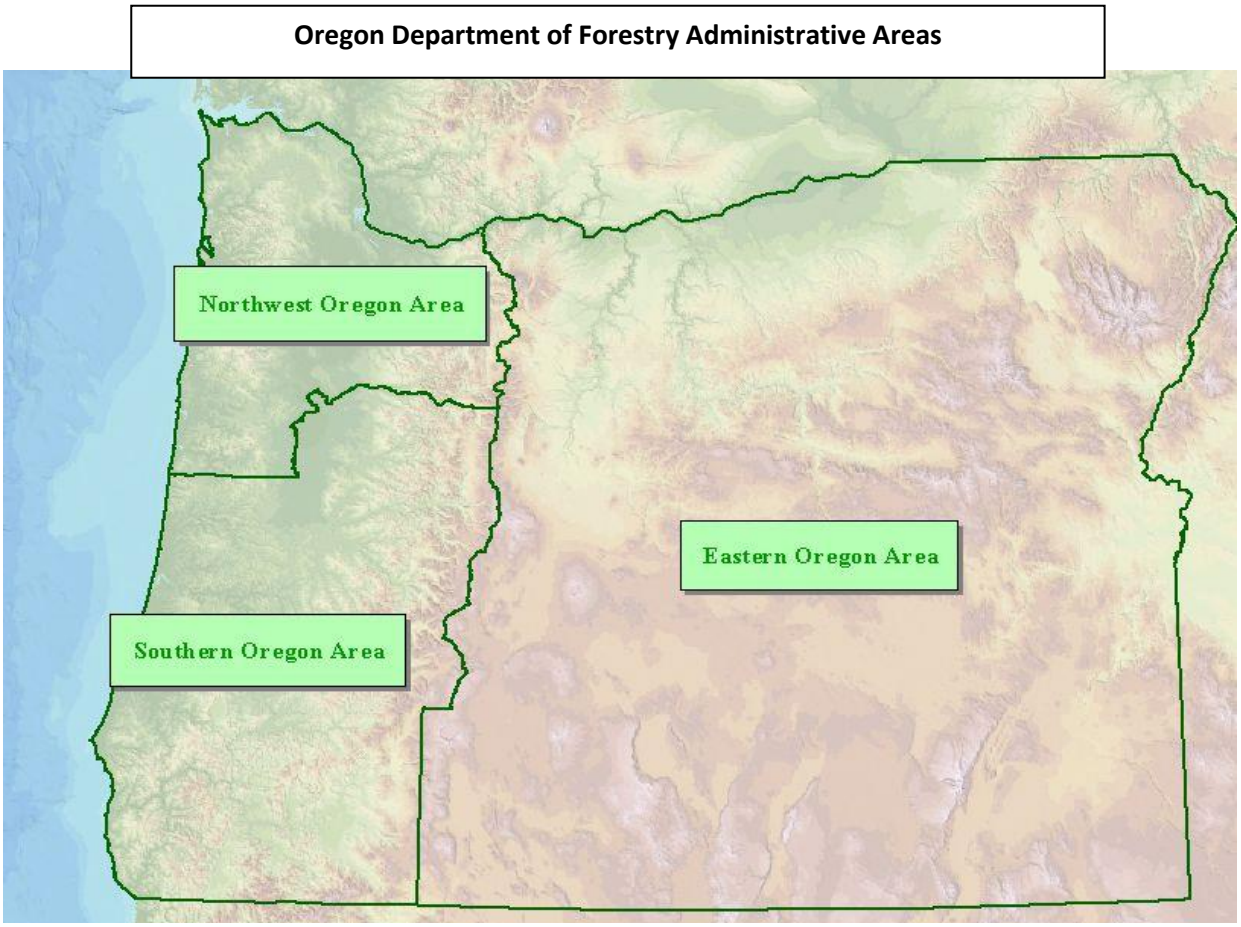

Oregon Department of Forestry Protection Districts
Northwest Oregon Area
Eastern Oregon Area
Southern Oregon Area
Non ODF Area
State Headquarters
Unit Office
District Office
Other ODF Office Sites
Astoria
Forest Grove
Tillamook
Non ODF
North Cascade
Central Oregon
West Oregon
Western Lane
South Cascade
Central Oregon
Coos FPA
Douglas FPA
Walker Range FPA
Southwest Oregon
Klamath-Lake
Non ODF
Northeast Oregon
Northeast Oregon
Central Oregon
ODF GIS Unit/rz
5/23/05
Personnel Directory

Figure 6


Oregon Department of Forestry Administrative Areas
Northwest Oregon Area
Eastern Oregon Area
Southern Oregon Area

Appendix A: Forest Practices Act Definitions

The Oregon Administrative Rules contain OARs filed through October 15, 2012

DEPARTMENT OF FORESTRY

DIVISION 600

DEFINITIONS

OAR 629-600-0100

Definitions

As used in OAR chapter 629, divisions 605 through 669 and divisions 680 through 699, unless otherwise required by context:

(1) "Abandoned resource site" means a resource site that the State Forester determines is not active.

(2) "Active resource site" means a resource site that the State Forester determines has been used in the recent past by a listed species. 'Recent past' shall be identified for each species in administrative rule. Resource sites that are lost or rendered not viable by natural causes are not considered active.

(3) "Active roads" are roads currently being used or maintained for the purpose of removing commercial forest products.

(4) "Aquatic area" means the wetted area of streams, lakes and wetlands up to the high water level. Oxbows and side channels are included if they are part of the flow channel or contain fresh water ponds.

(5) "Artificial reforestation" means restocking a site by planting trees or through the manual or mechanical distribution of seeds.

(6) "Basal area" means the area of the cross-section of a tree stem derived from DBH.

(7) "Basal area credit" means the credit given towards meeting the live tree requirements within riparian management areas for placing material such as logs, rocks or rootwads in a stream, or conducting other enhancement activities such as side channel creation or grazing exclosures.

(8) "Bog" means a wetland that is characterized by the formation of peat soils and that supports specialized plant communities. A bog is a hydrologically closed system without flowing water. It is usually saturated, relatively acidic, and dominated by ground mosses, especially sphagnum. A bog may be forested or non-forested and is distinguished from a swamp and a marsh by the dominance of mosses and the presence of extensive peat deposits.

(9) "Channel" is a distinct bed or banks scoured by water which serves to confine water and that periodically or continually contains flowing water.

(10) "Chemicals" means and includes all classes of pesticides, such as herbicides, insecticides, rodenticides, fungicides, plant defoliants, plant desiccants, and plant regulators, as defined in ORS 634.006(8); fertilizers, as defined in ORS 633.311; petroleum products used as carriers; and chemical application adjuvants, such as surfactants, drift control additives, anti-foam agents, wetting agents, and spreading agents.

(11) "Commercial" means of or pertaining to the exchange or buying and selling of commodities or services. This includes any activity undertaken with the intent of generating income or profit; any activity in which a landowner, operator or timber owner receives payment from a purchaser of forest products; any activity in which an operator or timber owner receives payment or barter from a landowner for services that require notification under OAR 629-605-0140; or any activity in which the landowner, operator, or timber owner barters or exchanges forest products for goods or services. This does not include firewood cutting or timber milling for personal use.

(12) "Completion of the operation" means harvest activities have been completed to the extent that the operation area will not be further disturbed by those activities.

(13) "Conflict" means resource site abandonment or reduced resource site productivity that the State Forester determines is a result of forest practices.

(14) "Debris torrent-prone streams" are designated by the State Forester to include channels and confining slopes that drain watersheds containing high landslide hazard locations that are of sufficient confinement and channel gradient to allow shallow, rapid landslide movement.

(15) "Department" means the Oregon Department of Forestry.

(16) "Diameter breast height" (DBH) means the diameter of a tree inclusive of the bark measured four and one-half feet above the ground on the uphill side of the tree.

(17) "Domestic water use" means the use of water for human consumption and other household human use.

(18) "Dying or recently dead tree" means a tree with less than ten percent live crown or a standing tree which is dead, but has a sound root system and has not lost its small limbs. Needles or leaves may still be attached to the tree.

(19) "Estuary" means a body of water semi-enclosed by land and connected with the open ocean within which saltwater is usually diluted by freshwater derived from the land. "Estuary" includes all estuarine waters, tidelands, tidal marshes, and submerged lands extending upstream to the head of tidewater. However, the Columbia River Estuary extends to the western edge of Puget Island.

(20) "Exposure categories" are used to designate the likelihood of persons being present in structures or on public roads during periods when shallow, rapidly moving landslides may occur.

(21) "Filling" means the deposit by artificial means of any materials, organic or inorganic.

(22) "Fish use" means inhabited at any time of the year by anadromous or game fish species or fish that are listed as threatened or endangered species under the federal or state endangered species acts.

(23) "Fledging tree" means a tree or trees close to the nest which the State Forester determines are regularly used by young birds to develop flying skills.

(24) "Foraging area" means an area (usually a body of water) where bald eagles concentrate their hunting activities.

(25) "Foraging perch" means a tree or other structure that overlooks a portion of a foraging area and is habitually used by bald eagles as a vantage point while hunting.

(26) "Forestland" means land which is used for the growing and harvesting of forest tree species, regardless of how the land is zoned or taxed or how any state or local statutes, ordinances, rules or regulations are applied.

(27) "Free to grow" means the State Forester's determination that a tree or a stand of well distributed trees, of acceptable species and good form, has a high probability of remaining or becoming vigorous, healthy, and dominant over undesired competing vegetation. For the purpose of this definition, trees are considered well distributed if 80 percent or more of the portion of the operation area subject to the reforestation requirements of the rules contains at least the minimum per acre tree stocking required by the rules for the site and not more than ten percent contains less than one-half of the minimum per acre tree stocking required by the rules for the site.

(28) "Further review area" means an area of land that may be subject to rapidly moving landslides as mapped by the State Department of Geology and Mineral Industries or as otherwise determined by the State Forester.

(29) "Geographic region" means large areas where similar combinations of climate, geomorphology, and potential natural vegetation occur, established for the purposes of implementing the water protection rules.

(30) "High landslide hazard location" means a specific site that is subject to initiation of a shallow, rapidly moving landslide.

(31) "High water level" means the stage reached during the average annual high flow. The "high water level" often corresponds with the edge of streamside terraces, a change in vegetation, or a change in soil or litter characteristics.

(32) "Hydrologic function" means soil, stream, wetland and riparian area properties related to the storage, timing, distribution, and circulation of water.

(33) "Important springs" are springs in arid parts of eastern Oregon that have established wetland vegetation, flow year round in most years, are used by a concentration of diverse animal species, and by reason of sparse occurrence have a major influence on the distribution and abundance of upland species.

(34) "Inactive roads" are roads used for forest management purposes exclusive of removing commercial forest products.

(35) "Key components" means the attributes which are essential to maintain the use and productivity of a resource site over time. The key components vary by species and resource site. Examples include fledging trees or perching trees.

(36) "Lake" means a body of year-round standing open water.

(a) For the purposes of the forest practice rules, lakes include:

(A) The water itself, including any vegetation, aquatic life, or habitats therein; and

(B) Beds, banks or wetlands below the high water level which may contain water, whether or not water is actually present.

(b) "Lakes" do not include water developments as defined in section (82) of this rule.

(37) "Landslide mitigation" means actions taken to reduce potential landslide velocity or re-direct shallow, rapidly moving landslides near structures and roads so risk to persons is reduced.

(38) "Large lake" means a lake greater than eight acres in size.

(39) "Large wood key piece" means a portion of a bole of a tree, with or without the rootwad attached, that is wholly or partially within the stream, that meets the length and diameter standards appropriate to stream size and high water

volumes established in A Guide to Placing Large Wood in Streams, Oregon Department of Forestry and Oregon Department of Fish and Wildlife, May 1995.

(40) "Live tree" means a tree that has 10 percent or greater live crown.

(41) "Local population" means the number of birds that live within a geographical area that is identified by the State Forester. For example: the area may be defined by physical boundaries, such as a drainage or subbasin.

(42) "Main channel" means a channel that has flowing water when average flows occur.

(43) "Natural barrier to fish use" is a natural feature such as a waterfall, increase in stream gradient, channel constriction, or other natural channel blockage that prevents upstream fish passage.

(44) "Natural reforestation" means restocking a site with self-grown trees resulting from self-seeding or vegetative means.

(45) "Nest tree" means the tree, snag, or other structure that contains a bird nest.

(46) "Nesting territory" means an area identified by the State Forester that contains, or historically contained, one or more nests of a mated pair of birds.

(47) "Operation" means any commercial activity relating to the establishment, management or harvest of forest tree species except as provided by the following:

(a) The establishment, management or harvest of Christmas trees, as defined in ORS 571.505, on land used solely for the production of Christmas trees.

(b) The establishment, management or harvest of hardwood timber, including but not limited to hybrid cottonwood that is:

(A) Grown on land that has been prepared by intensive cultivation methods and that is cleared of competing vegetation for at least three years after tree planting;

(B) Of a species marketable as fiber for inclusion in the furnish for manufacturing paper products;

(C) Harvested on a rotation cycle that is 12 or fewer years after planting; and

(D) Subject to intensive agricultural practices such as fertilization, cultivation, irrigation, insect control and disease control.

(c) The establishment, management or harvest of trees actively farmed or cultured for the production of agricultural tree crops, including nuts, fruits, seeds and nursery stock.

(d) The establishment, management or harvest of ornamental, street or park trees within an urbanized area, as that term is defined in ORS 221.010.

(e) The management or harvest of juniper species conducted in a unit of less than 120 contiguous acres within a single ownership.

(f) The establishment or management of trees intended to mitigate the effects of agricultural practices on the environment or fish and wildlife resources, such as trees that are established or managed for windbreaks, riparian filters or shade strips immediately adjacent to actively farmed lands.

(g) The development of an approved land use change after timber harvest activities have been completed and land use conversion activities have commenced.

(48) "Operator" means any person, including a landowner or timber owner, who conducts an operation.

(49) "Other wetland" means a wetland that is not a significant wetland or stream-associated wetland.

(50) "Perch tree" means a tree identified by the State Forester which is used by a bird for resting, marking its territory, or as an approach to its nest.

(51) "Plan for an Alternate Practice" means a document prepared by the landowner, operator or timber owner, submitted to the State Forester for written approval describing practices different than those prescribed in statute or administrative rule.

(52) "Relief culvert" means a structure to relieve surface runoff from roadside ditches to prevent excessive buildup in volume and velocity.

(53) "Removal" means the taking or movement of any amount of rock, gravel, sand, silt, or other inorganic substances.

(54) "Replacement tree" means a tree or snag within the nesting territory of a bird that is identified by the State Forester as being suitable to replace the nest tree or perch tree when these trees become unusable.

(55) "Resource site" is defined for the purposes of protection and for the purposes of requesting a hearing.

(a) For the purposes of protection:

(A) For threatened and endangered bird species, "resource site" is the nest tree, roost trees, or foraging perch and all identified key components.

(B) For sensitive bird nesting, roosting and watering sites, "resource site" is the nest tree, roost tree or mineral watering place, and all identified key components.

(C) For significant wetlands "resource site" is the wetland and the riparian management area as identified by the State Forester.

(b) For the purposes of requesting a hearing under ORS 527.670(4) and 527.700(3), "resource site" is defined in OAR 629-680-0020.

(56) "Riparian area" means the ground along a water of the state where the vegetation and microclimate are influenced by year-round or seasonal water, associated high water tables, and soils which exhibit some wetness characteristics.

(57) "Riparian management area" means an area along each side of specified waters of the state within which vegetation retention and special management practices are required for the protection of water quality, hydrologic functions, and fish and wildlife habitat.

(58) "Roosting site" means a site where birds communally rest at night and which is unique for that purpose.

(59) "Roost tree" is a tree within a roosting site that is used for night time roosting.

(60) "Saplings and poles" means live trees of acceptable species, of good form and vigor, with a DBH of one to 10 inches.

(61) "Seedlings" means live trees of acceptable species of good form and vigor less than one inch in DBH.

(62) "Shallow, rapidly moving landslide" means any detached mass of soil, rock, or debris that begins as a relatively small landslide on steep slopes and grows to a sufficient size to cause damage as it moves down a slope or a stream channel at a velocity difficult for people to outrun or escape.

(63) "Side channel" means a channel other than a main channel of a stream that only has flowing water when high water level occurs.

(64) "Significant wetlands" means those wetland types listed in OAR 629-680-0310, that require site specific protection.

(65) "Snag" means a tree which is dead but still standing, and that has lost its leaves or needles and its small limbs.

(66) "Sound snag" means a snag that retains some intact bark or limb stubs.

(67) "Staging tree" is a tree within the vicinity of a roosting site that is used for perching by bald eagles before entering the roost.

(68) "Stream" means a channel, such as a river or creek, that carries flowing surface water during some portion of the year.

(a) For the purposes of the forest practice rules, streams include:

(A) The water itself, including any vegetation, aquatic life, or habitats therein;

(B) Beds and banks below the high water level which may contain water, whether or not water is actually present;

(C) The area between the high water level of connected side channels;

(D) Beaver ponds, oxbows, and side channels if they are connected by surface flow to the stream during a portion of the year; and

(E) Stream-associated wetlands.

(b) "Streams" do not include:

(A) Ephemeral overland flow (such flow does not have a channel); or

(B) Road drainage systems or water developments as defined in section (82) of this rule.

(69) "Stream-associated wetland" means a wetland that is not classified as significant and that is next to a stream.

(70) "Structural exception" means the State Forester determines that no actions are required to protect the resource site. The entire resource site may be eliminated.

(71) "Structural protection" means the State Forester determines that actions are required to protect the resource site. Examples include retaining the nest tree or perch tree.

(72) "Temporal exception" means the State Forester determines that no actions are required to prevent disturbance to birds during the critical period of use.

(73) "Temporal protection" means the State Forester determines that actions are required to prevent disturbance to birds during the critical period of use.

(74) "Tree leaning over the channel" means a tree within a riparian management area if a portion of its bole crosses the vertical projection of the high water level of a stream.

(75) "Tyee Core Area" means a location with geologic conditions including thick sandstone beds with few fractures. These sandstones weather rapidly and concentrate water in shallow soils creating a higher shallow, rapidly moving landslide hazard. The Tyee Core area is located within coastal watersheds from the Siuslaw watershed south to and including the Coquille watershed, and that portion of the Umpqua watershed north of Highway 42 and west of Interstate 5. Within these boundaries, locations where bedrock is highly fractured or not of sedimentary origin as determined in the field by a geotechnical specialist are not subject to the Tyee Core area slope steepness thresholds.

(76) "Type D stream" means a stream that has domestic water use, but no fish use.

(77) "Type F stream" means a stream with fish use, or both fish use and domestic water use.

(78) "Type N stream" means a stream with neither fish use nor domestic water use.

(79) "Unit" means an operation area submitted on a notification of operation that is identified on a map and that has a single continuous boundary. Unit is used to determine compliance with ORS 527.676 (down log, snag and green live tree retention), ORS 527.740 and 527.750 (harvest type 3 size limitation), and other forest practice rules.

(80) "Vacated roads" are roads that have been made impassable and are no longer to be used for forest management purposes or commercial forest harvesting activities.

(81) "Water bar" means a diversion ditch and/or hump in a trail or road for the purpose of carrying surface water runoff into the vegetation and duff so that it does not gain the volume and velocity which causes soil movement or erosion.

(82) "Water development" means water bodies developed for human purposes that are not part of a stream such as waste treatment lagoons, reservoirs for industrial use, drainage ditches, irrigation ditches, farm ponds, stock ponds, settling ponds, gravel ponds, cooling ponds, log ponds, pump chances, or heli-ponds that are maintained for the intended use by human activity.

(83) "Waters of the state" include lakes, bays, ponds, impounding reservoirs, springs, wells, rivers, streams, creeks, estuaries, marshes, wetlands, inlets, canals, the Pacific Ocean within the territorial limits of the State of Oregon, and all other bodies of surface or underground waters, natural or artificial, inland or coastal, fresh or salt, public or private (except those private waters which do not combine or effect a junction with natural surface or underground waters), which are wholly or partially within or bordering the state or within its jurisdiction.

(84) "Wetland" means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands include marshes, swamps, bogs, and similar areas. Wetlands do not include water developments as defined in section (82) of this rule.

(85) "Written plan" means a document prepared by an operator, timber owner or landowner that describes how the operation is planned to be conducted.

Stat. Auth.: ORS 527.710(1)
Stats. Implemented: ORS 527.630(5), 527.674 & 527.714
Hist.: FB 31, f. 6-14-72, ef. 7-1-72; FB 39, f. 7-3-74, ef. 7-25-74; FB 1-1978, f. & ef. 1-6-78; FB 5-1978, f. & ef. 6-7-78; FB 3-1983, f. & ef. 9-13-83; FB 1-1985, f. & ef. 3-12-85; FB 2-1985(Temp), f. & ef. 4-24-85; FB 2-1987, f. 5-4-87, ef. 8-1-87; FB 4-1988, f. 7-27-88, cert. ef. 9-1-88; FB 4-1990, f. & cert. ef. 7-25-90; FB 1-1991, f. & cert. ef. 5-23-91; FB 7-1991, f. & cert. ef. 10-30-91; FB 3-1994, f. 6-15-94, cert. ef. 9-1-94; FB 5-1994, f. 12-23-94, cert. ef. 1-1-95; FB 9-1996, f. 12-2-96, cert. ef. 1-1-97, Renumbered from 629-024-0101; DOF 6-2002, f. & cert. ef. 7-1-02; DOF 13-2002, f. 12-9-02 cert. ef. 1-1-03; DOF 6-2005(Temp), f. & cert. ef. 8-2-05 thru 1-27-06; DOF 8-2005, f. 12-13-05, cert. ef. 1-1-06; DOF 7-2006(Temp), f. & cert. ef. 6-27-06 thru 12-23-06; DOF 1-2007, f. & cert. ef. 1-8-07

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Appendix B: Supplement to Stream Crossing Data: BRIDGES

Oregon Department of Forestry
JUNE 1, 2013
2013 FOREST PRACTICES COMPLIANCE AUDIT –
Supplement to Stream Crossing Data: BRIDGES

In some instances stream crossings on Skid Trails and/or Roads will be bridges rather than culverts. Additional information is requested for Bridges. Record Data for a Stream Crossing (approach, drainage, etc.) and then Supplement info captured here.

Measurements taken of bridge installations will determine;

a) **Peak Flow capacity of the structure**
b) **Road runoff relationships**
c) **Fill stability**

General Information:

A) **Notification** _____

B) **Surveyors name** _____

C) **Date** _____

D) **GPS point – taken in approximate center of bridge** _____

E) **Stream Type** _____

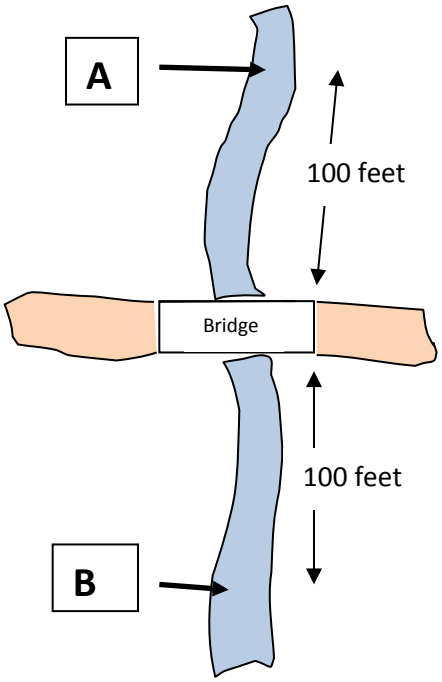
F) **Road Type** _____

G) **Approach drains (circle one) From Bridge / Toward Bridge / Flat Approach**

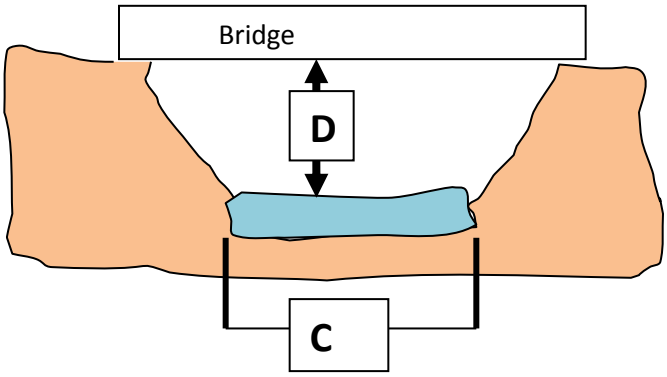
Record Data on this sheet – no coding, just old fashioned pencil will do.

Please note the following at each bridge site, to the nearest foot:

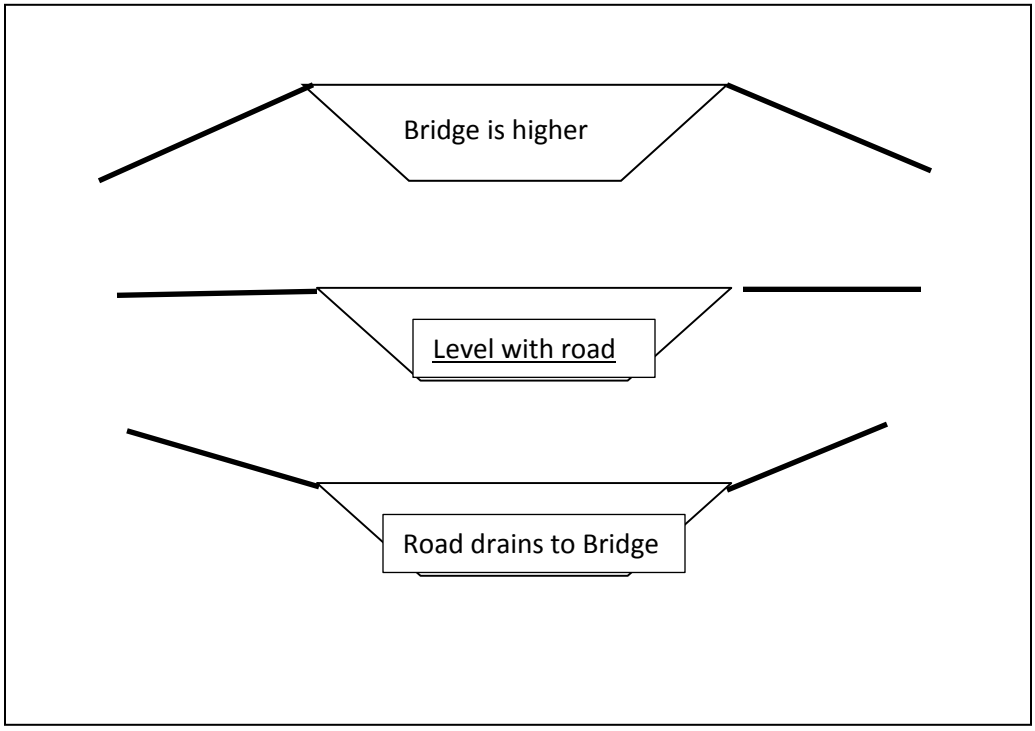
A) Bankfull Width at a point 100 feet upstream of Bridge: _____
B) Bankfull Width at a point 100 feet downstream of Bridge: _____
C) Bankfull Width below (at) the Bridge : _____
D) Freeboard, i.e. – distance from bottom of bridge to Ordinary High Water: _____



Plan View – Bridge Stream Crossing

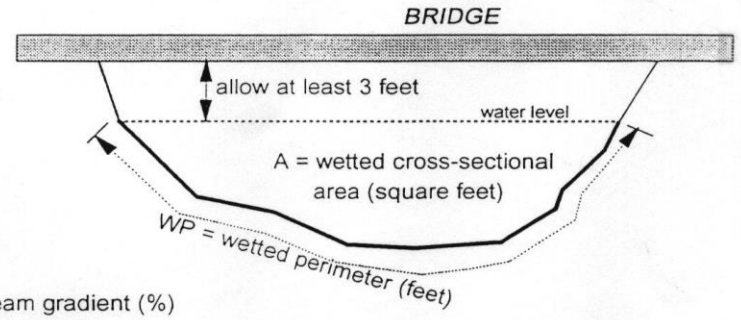


Profile View – Bridge Stream Crossing



Flow capacity under bridge =

$$30 * A * (S/100)^{.5} * (A/WP)^{.67}$$



S = stream gradient (%)

EXAMPLE: If the stream gradient is 2 %, the wetted cross-sectional area is 120 square feet, and the wetted perimeter is 30 feet, then the flow capacity would be 1289 cfs.

Appendix II:

Assumptions and criteria used in calculation of compliance

Data collected by the contractor needed to be translated into a quantitative assessment of compliance with the Forest Practices Act. Additionally, a determination had to be made of which rules were applicable to a given operation. These assessments and determinations often were difficult, because the collected data were often surrogates for the factors we were interested in. Thus, we had to generate a set of criteria for accomplish these processes. The assumptions and criteria we used for each rule are given below.

Rules:

629-605-170-1a. Written plan if operating within 100 feet of streams and lakes.

Applicability: A written plan code (WP100) is listed by the contractor on the WOS data sheet.

Compliance criteria: A written plan is provided for the operation.

Comments: We may not have a complete set of written plans with which to assess compliance. When analyzing compliance, rules 629-605-170-1a, 629-625-100-2b, 629-625-100-2c, must be assessed together, because they all use the WP100 code. If desired, rule 629-630-700-3 may be assessed separately based on a WP_Yard code, but presently is aggregated with the others.

629-625-100-2b. Written plan if using machinery in Type F or D streams.

Applicability: A written plan code (WP100) is listed by the contractor on the WOS data sheet.

Compliance criteria: A written plan is provided for the operation.

Comments: We may not have a complete set of written plans with which to assess compliance. When analyzing compliance, rules 629-605-170-1a, 629-625-100-2b, 629-625-100-2c, must be assessed together, because they all use the WP100 code. If desired, rule 629-630-700-3 may be assessed separately based on a WP_Yard code, but presently is aggregated with the others.

This is a duplicate of rule 629-625-430-2.

629-625-100-2c. Written plan if building a road in an RMA.

Applicability: A written plan code (WP100) is listed by the contractor on the WOS data sheet.

Compliance criteria: A written plan is provided for the operation.

Comments: We may not have a complete set of written plans with which to assess compliance. When analyzing compliance, rules 629-605-170-1a, 629-625-100-2b, 629-625-100-2c, must be assessed together, because they all use the WP100 code. If desired, rule 629-630-700-3 may be assessed separately based on a WP_Yard code, but presently is aggregated with the others.

629-625-310-2. Road design – End Haul Waste Material

Applicability: A road sheet is filled out for the site. For application-based analysis, n is the number of recorded road segments.

Compliance criteria: No S (sidecast) codes are recorded on slopes exceeding 60% (40% in granitic soils). (These slopes are noted in the SteepSdcastFill column.)

Comments: The current criterion includes units/segments where no steep slopes occur. Originally, the applicability criteria had included a requirement that roadHslope >60. However, subsequent analysis revealed frequent "S" coding on segments where roadHslope<60. If the current criterion is too broad, we still might be able to use a roadHslope screen. Currently, S codes occur on segments with recorded roadHslope down to 45.

A more complete applicable population might also be obtained from GIS analysis of steep slopes on operations. However, this might take considerable time. Also, the current applicability analysis does has not considered whether there were any granitic soils in the surveys. Both GIS analysis and consideration of granitic soils could increase the applicable population, resulting in a higher calculated compliance rate.

The compliance criteria use the 60%/40% slopes as a surrogate for HLHL.

629-625-310-3. Road Design – Minimize Width.

Applicability. A new road is listed on the roads datasheet. For application-based analysis, n is the number of recorded new roads.

Compliance criteria. Spurs do not exceed 18 feet, collector roads do not exceed 22 feet, and mainlines do not exceed 30 feet in width.

Comments: Applicability is straightforward. However, no damage is necessary to a resource is currently necessary to establish noncompliance. This is inconsistent with guidance and also disproportionate to our in-house view of the importance of the rule.

629-625-310-4. Road Design – Design cut and fill slopes to minimize landslide risk.

Applicability. A new road with slopes exceeding 40% is recorded on the roads datasheet. For application-based analysis, n is the number of recorded new road segments exceeding 40% slope.

Compliance criteria. A steep fill (F) is not recorded for any new roads. (The F code would be recorded for slopes exceeding 60%, or 40% on granitic soils.)

Comments. A GIS analysis could be performed to narrow the applicable population to those sales containing steep ground. This could be time-consuming, and would likely result in a lower calculated compliance rate.

The applicability criterion could be changed to include only those units/segments on new roads with a recorded fill code. This would eliminate units/segments without fills, with the likely effect of decreasing the calculated compliance rate.

The compliance criteria use the 60%/40% slopes as a surrogate for HLHL.

629-625-310-5. Stabilize stream crossing fills to present fill failure and damage to Waters of the State.

Applicability. New and/or reconstructed stream crossings are listed on a Stream Xing datasheet. For application-based analysis, n is the number of new/reconstructed stream-crossings.

Compliance criteria. Slumps and/or cracks are not recorded on a stream crossing fill. Additionally, unarmored fills exceeding 80% slope are not recorded.

Comments. The applicability appears straightforward, and the chosen criteria appear to be representative indicators of fill stability.

629-625-320-1b. Written plan if stream crossing fill exceeds 15'.

Applicability: Surveyor records a fill height exceeding 15', or query calculates a fill height exceeding 15' from fill slope and distance data.

Compliance criteria: A written plan is provided for the operation.

Comments: We may not have a complete set of written plans with which to assess compliance.

629-625-320-1c. Construct stream crossing structures to prevent erosion of fill and channel.

Applicability. New or reconstructed stream crossing is recorded on datasheet. For application-based analysis, n is the number of new/reconstructed crossings.

Compliance criteria: Gullies are not recorded in the crossing fill.

Comments: The compliance criteria only addresses fill erosion, not channel erosion.

629-625-330-2. Do not concentrate drainage water onto landslide-prone areas or steep erodible fillslopes.

Applicability: Unit contains segments with recorded road fill. For application-based analysis, n is the number of road segments with a recorded fill.

Compliance criteria. Flow is not directed to an unconsolidated fillslope (U code in flowdirto) when there is a steep fill recorded on the segment.

Comments: The compliance criteria do not directly address the issue of landslide-prone areas.

629-625-330-3. Do not divert water from stream channels to roadside ditches.

Applicability: A stream crossing sheet has been filled out for the unit. For application-based analysis, n is the number of stream crossings.

Compliance criteria: Flow is not diverted from stream to road, (i.e., A DIV code is not recorded in WOSCon).

Comments. None

629-625-330-4. Install drainage structures above stream crossings to reduce sediment delivery to streams.

Applicability: Stream Crossing datasheet filled out. For application-based analysis, n is the number of stream crossings.

Compliance criteria: No sediment delivery within 10' of streams from ditches or roads. (No issues codes of D or R).

Comments: The 10' criterion assumes that sediment deposited within that distance will eventually find its way to the stream.

629-625-330-5. Provide drainage when roads cross springs, seeps, wet areas.

Applicability: New roads listed on roads datasheet. For application-based analysis, n would be the number of new road segments.

Compliance criteria: Flow is not directed to road from wet area (FlowDir code not W).

Comments: The applicability criteria tend toward a high calculated compliance rate because some segments may be nowhere near wet areas.

629-330-6. Provide a drainage system to minimize gully erosion on road.

Applicability: New roads listed on roads datasheet. For application-based analysis, n would be the number of new road segments.

Compliance criteria: No gullies connect to waters of the state. (If gully codes present, no code of DI or RR under WOSCon).

Comments: None.

629-625-410. Do not place excess construction materials where they may enter waters of the state.

Applicability: Both a roads sheet and a WOS sheet has been filled out for the unit. For application-based analysis, n is the number of road segments on units for which a WOS sheet has been filled out.

Compliance criteria: If road is within 50 feet, no disturbance to WOS from sidecast, stumps, or road rock.

Comments. The applicable population contains units/segments where streams are nowhere near the road. This will increase calculated compliance rate. A GIS analysis could be used to draw the applicable population from streams within a given distance of the road, but would require additional time and would be subject to inaccuracies in the GIS layers.

Another possibility would be to draw the population from streams where Xing/road distance<10' on the WOS sheet. This is likely to result in a much smaller population, thus lower calculated compliance. Also, stream segments that start >10' from a road but end <10' may be recorded as >10' on the datasheet.

The 50' road distance criterion was used as an arbitrary measure to separate road-related disturbance from harvest-related disturbance, which is covered under a different rule.

629-625-420-1. On new roads, clear channels and ditches of slash and road construction debris.

Applicability: Unit has new roads, with ditch or stream culverts present. For application-based analysis, n is the number of new road segments with culverts.

Compliance criteria: No blocked culverts result in sediment delivery to WOS (no BXD code in WOSConn).

Comments: Older culverts are covered by rule 629-625-600-3. The compliance criteria assume that all culvert blockages will be the result of slash or road construction activities.

629-625-420-2. Provide effective cross drainage on all new roads.

Applicability. Units with new roads listed on roads datasheet. For application-based analysis, n is the number of new road segments.

Compliance criteria: No new road segments are delivering sediment to a WOS via ditch (DI), drain outflow (DO), or road runoff (RR).

Comments: None

629-625-420-5. Remove berms on edges of roads or provide effective drainage through berms.

Applicability: Units with new roads listed on roads datasheet. For application-based analysis, n is the number of new road segments.

Compliance criteria. No sediment delivery to WOS from berm drainage (BD).

Comments: None.

629-625-430-2. Written plan if using machinery in Type F or D streams.

Applicability: A written plan code (WP100) is listed by the contractor on the WOS data sheet.

Compliance criteria: A written plan is provided for the operation.

Comments: We may not have a complete set of written plans with which to assess compliance. When analyzing compliance, rules 629-605-170-1a, 629-625-100-2b, 629-625-100-2c, must be assessed together, because they all use the WP100 code. If desired, rule 629-630-700-3 may be assessed separately based on a WP_Yard code, but presently is aggregated with the others.

This is a duplicate of rule 629-625-100-2b.

629-625-430-5. Construct sediment barriers on temporary crossings.

Applicability: Unit contains a temporary stream crossing on a road. This includes crossings with a SegmentType code of T, or with a non-null, non-zero TempXing field. For application-based analysis, n is the number of temporary crossings on roads.

Compliance criteria: Temporary crossings have two drainage structures appropriately spaced from stream (inner within 30', outer depending on stream size), and no sediment delivery to stream from ditches or road surface.

Comments: Coding for temporary crossings changed early in survey process. The compliance query is very complex in Access, increasing the possibility for errors.

Survey methodology allows multiple codes on separate lines when there are multiple issues with stream crossings. This can result in the query returning multiple noncompliance answers at a single crossing, hence overstatement of noncompliance. If desired, the query can be modified to give only one answer per crossing.

629-625-440-1. Stabilize exposed, unstable material through seeding.

Applicability: Units where new roads with cuts or fills are identified on the roads datasheet. For application-based analysis, n is the number of new road segments with cuts and fills.

Compliance criteria: If road cuts or fills are slumping or eroding (SL,ER) along new roads, they are not delivering to streams (WOSCon is null).

Comments: None.

629-625-440-3. Do not incorporate large amounts of organics in fills.

Applicability: Units where new roads with fill are identified on the roads datasheet. For application-based analysis, n is the number of new road segments with fill.

Compliance criteria: On new roads, organic waste is not incorporated in road fill (FillCond not WA).

Comments: None

629-625-500-2. Do not locate quarry sites in channels.

Applicability: Units with quarries listed on LQ datasheet and WOS sheet filled out. For application-based analysis, n is the number of quarries in units where WOS sheets have been filled out.

Compliance criteria: Quarry is not in channel (Issues not QC).

Comments: To date, surveyors have found very few quarries in the compliance audit units.

The current applicable population includes all in-unit WOS, regardless of proximity to quarries. If desired, GIS analysis could be used to reduce this population, but would take extra time.

629-625-500-3. Prevent quarry-related waste from entering WOS.

Applicability: Units with active quarries listed on LQ datasheet and WOS sheet filled out. For application-based analysis, n is the number of quarries in units where WOS sheets have been filled out.

Compliance criteria: Waste is not delivered from the active quarry to the bankfull width of a WOS (BFW) or to a channel leading to the WOS (CTW). Waste under consideration includes overburden (OB), solid waste (SW), or petroleum waste(PW).

Comments: To date, surveyors have found very few quarries in the compliance audit units.

The current applicable population includes all in-unit WOS, regardless of proximity to quarries. If desired, GIS analysis could be used to reduce this population, but would take extra time.

629-625-500-4. Stabilize active quarry surfaces to prevent erosion/landslides.

Applicability: Units with active quarries listed on LQ datasheet and WOS sheet filled out. For application-based analysis, n is the number of quarries in units where WOS sheets have been filled out.

Compliance criteria: If landslides occur above or below an active quarry, they do not deliver to a WOS.

Comments: To date, surveyors have found very few quarries in the compliance audit units.

The current applicable population includes all in-unit WOS, regardless of proximity to quarries. If desired, GIS analysis could be used to reduce this population, but would take extra time.

629-625-500-5. Stabilize inactive quarry surfaces to prevent erosion/landslides, dispose of petroleum-related waste, and ensure other waste does not enter WOS.

Applicability: Units with inactive quarries listed on LQ datasheet and WOS sheet filled out. For application-based analysis, n is the number of quarries in units where WOS sheets have been filled out.

Compliance criteria: If landslides occur above or below an inactive quarry, they do not deliver waste to a WOS. Waste under consideration includes overburden (OB), solid waste (SW), or petroleum waste(PW).

Comments: To date, surveyors have found very few quarries in the compliance audit units.

The current applicable population includes all in-unit WOS, regardless of proximity to quarries. If desired, GIS analysis could be used to reduce this population, but would take extra time.

629-625-600-2. Maintain active and inactive roads with a stable surface and an effective drainage system.

Applicability: Unit contains old roads as listed on roads datasheet. For application-based analysis, n is the number of old road segments reported on the sheet.

Compliance criteria: For older roads, no sediment delivery to WOS from ditches (DI), drain outflows (DO), road runoff (RR), or berm drainage (BD).

Comments: Blocked cross drains are covered under 629-625-600-3, rather than here.

629-625-600-3. Maintain drainage structures to diminish likelihood of clogging and washouts.

Applicability: Unit contains old roads as listed on roads datasheet. For application-based analysis, n is the number of old road segments reported on the sheet.

Compliance criteria: For older roads, no sediment delivery to WOS from blocked cross drains.

Comments: Criteria were changed to require sediment delivery to establish noncompliance.

629-625-600-5. Apply road oil, surface stabilizers in a manner that prevents entry to waters of state.

Applicability: Unit contains roads as listed on roads datasheet. For application-based analysis, n is the number of road segments reported on the sheet.

Compliance criteria: There is no connection between an oiled road (OR) and waters of the state.

Comments: The current applicability criteria may over-represent the applicable population. I am not certain if there is any way to extract a class of road that is likely to get oiled from our current data. There were no compliance issues identified in the first 100 sites.

629-630-150-7. Do not locate skid trails straight up/down steep, erodible slopes >100' unless effective drainage is provided.

Applicability: Units for which a WOS sheet is filled out and the unit data sheet indicates that skid trails were present. For application-based analysis, n is the number of WOS segments on units with skid trails.

Compliance criteria: No skid trails are connected to WOS and oriented directly up a steep hillslope for a distance exceeding 100 feet (i.e., no SUC code in SkidIssues).

Comments. Appropriate applicability criteria are difficult to derive because we do not survey all skid trails. The current applicability criteria provide a large population of streams that may or may not be near skid trails. This will tend to diminish calculated noncompliance rates. We could change the criteria to restrict the population to those WOS segments with a non-null Skid35 entry. This would tend to amplify any noncompliance, so we would want to be clear what our sample population was. In the first 100 sites, there were no compliance issues identified. Our criteria seem to differ from guidance, which indicates the 200' is the critical distance.

629-630-150-8. Install cross ditches on skid trails on steep, erodible slopes.

Applicability: Units for which a WOS sheet is filled out. For application-based analysis, n is the number of WOS segments reported on the sheet.

Compliance criteria: No skid trails are connected to WOS and oriented obliquely up a steep hillslope for a distance exceeding 100 feet (i.e., no SSC code in SkidIssues).

Comments. Appropriate applicability criteria are difficult to derive because we do not survey all skid trails. The current applicability criteria provide a large population of streams that may or may not be near skid trails. This will tend to diminish calculated noncompliance rates. We could change the criteria to restrict the population to those WOS segments with a non-null Skid35 entry. This would tend to amplify any noncompliance, so we would want to be clear what our sample population was. In the first 100 sites, there were no compliance issues identified.

629-630-200-3. Written plan if building landings within an RMA.

Applicability: Landings are recorded in the RMA (Issues = LR) on the LQ datasheet.

Compliance criteria: A written plan is provided for the operation.

Comments: We may not have a complete set of written plans with which to assess compliance. Through the first 100 sites, very few landings were built in the RMA. We may need to aggregate this with other written plan rules when assessing compliance.

629-630-200-4. Do not incorporate large amounts of organics in landing fills.

Applicability: Landings are recorded in the unit. For application-based analysis, n is the number of recorded landings.

Compliance criteria: No stumps/slash/logs are identified in the landing fill (i.e., Issues not LF).

Comments: None.

629-630-300-2. Construct water diversions in skid trails to keep sediment from entering WOS.

Applicability: Units for which a WOS sheet is filled out. For application-based analysis, n is the number of WOS segments reported on the sheet.

Compliance criteria: Skid trail on gentle slopes is not connected to a WOS (i.e., no SOTH code under Issues).

Comments. Appropriate applicability criteria are difficult to derive because we do not survey all skid trails. The current applicability criteria provide a large population of streams that may or may not be near skid trails. This will tend to diminish calculated noncompliance rates. We could change the criteria to restrict the population to those WOS segments with a non-null Skid35 entry. This would tend to amplify any noncompliance, so we would want to be clear what our sample population was. In the first 100 sites, there were no compliance issues identified.

629-630-300-4. Maintain effective drainage on landings during and after use.

Applicability: Landings are recorded in the unit. For application-based analysis, n is the number of recorded landings.

Compliance criteria: Landing does not drain to WOS (W).

Comments: None

629-630-400-1: Place harvest-related waste material where it won't enter waters of the state.

Applicability: Unit contains WOS sheet or LQ sheet. In application-related analyses, n is the number of stream segments + landings.

Compliance criteria: There is no landing-related waste in the bankfull width or on slopes>60%. Waste of concern for landings includes sidecast, overburden, stumps, and slashpiles. Also, there is no sidecast or stumps in WOS >50’ from road, and no slashpiles in streams and lakes.

Comments. The applicability criteria includes both units containing WOS, and those without WOS, but having landings. That is because this rule can get tripped by both WOS and LQ queries. The steep slope criterion for landings does not reference proximity to WOS.

Multiple waste types may trip this rule multiple times at a given location. This could result in overstatement of noncompliance. If desired, the query could be reset to only allow one noncompliance at a given gps point.

629-630-400-3. Remove petroleum waste from forest.

Applicability. Landings or active quarries are recorded in the unit. For application-based analysis, n is the number of recorded landings and active quarries.

Compliance criteria: No petroleum waste (PW) is recorded at the landing or quarry.

Comments: None.

629-630-400-4. Dispose of metal so that waste material does not enter WOS.

Applicability: Unit contains WOS. For application-based analysis, n is the number of WOS segments.

Compliance criteria: No metallic waste (MW) from recent harvest activities is recorded in WOS.

Comments: None

629-630-600-3b. Do not allow slash to accumulate in waters where they impair water quality or increase likelihood of mass debris movement.

Applicability. Unit contains type N streams, ¼ acre wetlands, and/or lakes. For application-based analysis, n is the number of recorded WOS segments meeting these criteria.

Compliance criteria: Slash cover does not exceed 50% in type N stream reaches of less than 10% gradient. Slash ponding and slash erosion does not occur in type N stream reaches of any gradient, nor in lakes or wetlands exceeding ¼ acre. Slash piles are not within wetlands.

Comments: In practice, surveys often occurred under dry conditions and slash ponding was called by visualizing different flow conditions..

629-630-600-3c. Place slash above high water levels.

Applicability: Unit contains WOS. For application-based analysis, n is the number of recorded WOS segments.

Compliance criteria: Slash is not within 10' of the channel's bankfull width (i.e., WOSDisturb not SP10).

Comments: None.

629-630-700-3.2. Written plan if operating within 100 feet of streams and lakes.

Applicability: A written plan code (WP_Yard) is listed by the contractor on the WOS data sheet.

Compliance criteria: A written plan is provided for the operation.

Comments: Rule 629-630-700-3 presently is assessed together with those units having a WP100 code, but may be assessed separately if desired and if sample size permits.

629-630-700-4. In certain WOS types, swing yarded material free of ground in aquatic areas and riparian areas.

Applicability: Units having WOS with cable corridors, other than small N streams and nonsignificant wetlands. For application-based analysis, n is the number of WOS segments meeting these criteria.

Compliance criteria: Cable corridor does not cause soil disturbance within 20' of WOS bankfull width (i.e., CableCorridor not CYS).

Comments: This rule appears to apply to significant wetlands and lakes, but the field guide for contractors says to record cable corridors for "all streams".

629-630-800-2. Do not operate ground-based equipment in stream channels.

Applicability. Unit contains streams. For application-based analysis, n is the number of recorded stream segments.

Compliance criteria: On stream segments greater than 10 feet from the road, no tracks (TR) are observed in the stream channel.

Comments: The 10' criterion is an arbitrary division between road-related and harvest-related machine activity.

Stream segments are of unequal length. Thus, population size determined from number of stream segments may yield arbitrary results. This applies to other rules that rely on counts of stream segments, as well. An approach standardized to stream segment length would be possible, but would take extra time.

629-630-800-4a. Construct temporary crossings so they pass flows and minimize erosion/sedimentation.

Applicability: Unit contains a temporary stream crossing. This includes crossings with a SegmentType code of T, or with a non-null, non-zero TempXing field. For application-based analysis, n is the number of temporary crossings.

Compliance criteria: The temporary crossing does not result in streamflow alteration (SFA), stream erosion (SE), or sidecast ponding (SCP).

Comments: Coding for temporary crossings changed early in survey process.

Survey methodology allows multiple codes on separate lines when there are multiple issues with stream crossings. This can result in the query returning multiple noncompliance answers at a single crossing, hence overstatement of noncompliance. If desired, the query can be modified to give only one answer per crossing.

629-630-800-4e. Remove temporary stream crossings.

Applicability: Unit contains a temporary stream crossing. This includes crossings with a SegmentType code of T, or with a non-null, non-zero TempXing field. For application-based analysis, n is the number of temporary crossings.

Compliance criteria: The temporary crossing is recorded as successfully removed according to acceptable standards (TempXing not XNR).

Comments: Coding for temporary crossings changed early in survey process.

There is substantial overlap between 629-625-430-5 and this rule. I have placed the analysis relative to stream crossing removal in this heading, so that 629-625-430-5 can be devoted to drainage structures, which is also contained in that rule.

Survey methodology allows multiple codes on separate lines when there are multiple issues with stream crossings. This can result in the query returning multiple noncompliance answers at a single crossing, hence overstatement of noncompliance. If desired, the query can be modified to give only one answer per crossing.

629-630-800-6. After yarding, construct sediment barriers on stream crossing approaches.

Applicability. Skid trail crosses stream in unit (Crossing Type = S in streamxing table). For application-based analysis, n is the number of skid trails crossing streams.

Compliance criteria: Functional drainage structures are in place at appropriate distances from stream and there is no sediment delivery to WOS from skid trail. Appropriate distances include a structure within 30', and a second barrier at the end of the RMA for Large and Medium streams.

Comments: The query is complex in Access.

629-630-800-8. Minimize skid-trail-related soil exposure within RMAs, and do not locate skid trails within 35 feet of F and D streams.

Applicability: Type D or F streams present in unit. For application-based analysis, n is the number of D and F stream segments.

Compliance criteria: No skid trails are recorded within 35' of type F or D streams, and there is no recorded sediment contribution to these streams. (Skid35 more than 35, or is unrecorded, and no SOTH code under SkidIssues.)

Comments: F and D streams are generally standardized to 200' segments. Therefore, variations in population size because of arbitrary stream segment length should be minimal.

An approach based on number of skid trails is not possible because we do not have an inventory of skid trails. We only record the presence of skid trails if they are within 35 feet of stream, or otherwise are providing a problem to streams.

Currently, the query only addresses F and D streams. One portion of the rule seems to imply that adequate filtration be provided to all waters of the state, not just F/D. Thus, it may be appropriate to modify the SOTH portion of the query to include all stream types, in which case the applicable population would be modified accordingly.

629-640-100-2b. Retain all trees within 20 feet of high water level on Type F streams.

Applicability: All units containing type F streams. For application-based analysis, n is the number of Type F stream segments.

Compliance criteria: No stumps are recorded within 20' of Type F stream. (Stumps20=0)

Comments: F streams are generally standardized to 200' segments. Therefore, variations in population size because of arbitrary stream segment length should be minimal.

629-640-200-2b. Along D, and L-M N streams, retain all trees within 20 feet of high water level.

Applicability: All units containing Type D or Large or Medium Type N streams. For application-based analysis, n is the number of stream segments meeting these type criteria.

Compliance criteria: No stumps are recorded within 20' of Type D or Large/Medium Type N stream. (Stumps20=0)

Comments: Type D and Large/Medium Type N streams are generally standardized to 200' segments. Therefore, variations in population size because of arbitrary stream segment length should be minimal.

629-645-030-1. Protect soil from disturbance in significant wetlands and their RMAs.

Applicability: All units containing significant wetlands. For application-based analysis, n is the number of significant wetlands.

Compliance criteria: No machine tracks are found in significant wetlands (SWL). (No WOSDisturb code of TR where WOSType is SWL).

Comments: No SWL have been reported in compliance audit surveys.

The compliance criteria use machine tracks as a surrogate for all forms of disturbance. I do not know if there are significant operational disturbances that wouldn't leave tracks.

629-655-000-2a. Protect soil from disturbance in non-significant wetlands >1/4 acres.

Applicability: All units containing non-significant wetlands exceeding ¼ acre. For application-based analysis, n is the number of these wetlands.

Compliance criteria: No machine tracks are found in non-significant wetlands exceeding ¼ acre. (No WOSDisturb code of TR where WOSType is W¼).

Comments: The compliance criteria use machine tracks as a surrogate for all forms of disturbance. I do not know if there are significant operational disturbances that wouldn't leave tracks.

629-655-000-3. Protect soil and vegetation along small wetlands, springs, and seeps.

Applicability: All units containing wetlands less than ¼ acre. For application-based analysis, n is the number of these wetlands.

Compliance criteria: No machine tracks are found in non-significant wetlands less than ¼ acre. (No WOSDisturb code of TR where WOSType is W<¼).

Comments: The compliance criteria use machine tracks as a surrogate for all forms of disturbance. I do not know if there are significant operational disturbances that wouldn't leave tracks.

629-660-040-1. Do not divert water from streams.

Applicability: Streams are present on unit. For application-based analysis, n is the number of stream segments plus the number of landings.

Compliance criteria: No channelization, relocation, or diversion is recorded along the stream caused by logging machinery (WOSDisturb not CR). Also, no landings in the channel or altering stream course (LQ sheet, Issues not LCD).

Comments: Small Type N stream segments are of unequal length. Thus, population size determined from number of stream segments may yield arbitrary results. This applies to other rules that rely on counts of stream segments, as well. An approach standardized to stream segment length would be possible, but would take extra time.

The applicability criteria includes both units containing WOS, and those without WOS, but having landings. That is because this rule can get tripped by both WOS and LQ queries. In principle, any landing that could trigger this rule should have a WOS sheet filled out unless the affected WOS was outside the unit, so the current criteria may inflate population size. However, a criterion that only included WOS resulted in noncompliant segments exceeding population size on individual units for at least one of these landing-related rules.

629-660-040-2. Do not add soil or rock to any streams, or remove soil or rock from these streams.

Applicability: Streams are present on unit or landings are present on the unit. For application-based analysis, n is the number of stream segments and landings.

Compliance criteria: No channelization, relocation, or diversion caused by logging machinery is recorded along the stream (WOSDisturb not CR). Also, no material is added or removed from channel to create landing (LQ sheet, Issues not LCAR).

Comments: Small Type N stream segments are of unequal length. Thus, population size determined from number of stream segments may yield arbitrary results. This applies to other rules that rely on counts of stream segments, as well. An approach standardized to stream segment length would be possible, but would take extra time.

The applicability criteria includes both units containing WOS, and those without WOS, but having landings. That is because this rule can get tripped by both WOS and LQ queries. In principle, any landing that could trigger this rule should have a WOS sheet filled out unless the affected WOS was outside the unit, so the current criteria may inflate population size. However, a criterion that only included WOS resulted in noncompliant segments exceeding population size on individual units for at least one of these landing-related rules.

629-625-320-2a. Construct stream crossing structures to pass 50-year peak flow.

Applicability: Units containing new or reconstructed stream crossings. For application-based analysis, n is the number of these crossings.

Compliance criteria: Recorded culvert size is larger than the minimum size calculated from Tech Note #5 formulas.

Comments: There are several possible sources of uncertainty in the calculations used to derive minimum culvert size. Acreage draining to the culvert is estimated using visual GIS-assisted interpretation of topographic lines. In some cases, the source DEMs for these lines have been resampled to provide better (e.g., 10 foot) resolution, but these resampled lines are still subject to inaccuracies in the source data. The peak flow 50-year recurrence interval was interpolated using as per Tech Note 5. However, there are some points in the state that are open-ended (i.e., do not have two differing isolines to interpolate between) and special assumptions had to be made in these cases. Finally, the formula is complex, which could lead to errors in the Excel spreadsheet, although I believe that the formula has been transmitted correctly. On the Excel spreadsheet, I built in flagging formulas to detect when a calculated value was close to the pass/fail boundary. Guidance notes that if fill failure risk is low, undersized culverts are allowed to remain.

629-630-800-4c. Provide a written plan for temporary crossing fills exceeding 8 feet in height.

Applicability: Surveyor records a fill height exceeding 8', or query calculates a fill height exceeding 8' from fill slope and distance data.

Compliance criteria: A written plan is provided for the operation.

Comments: We may not have a complete set of written plans with which to assess compliance. Additionally, the formulas to calculate fill height is somewhat difficult to construct in Access, resulting in potential errors. Tests so far indicate that the current formula is correct. This requirement can be waived for a type N stream.

629-640-200-6. Retain understory vegetation within 20 feet of certain small N streams.

Applicability: All units containing small N streams that also meet the criteria of FPR Table 5. For application-based analysis, n is the number of Type N stream segments that meet these criteria.

Compliance criteria: No understory or nonmerchantable vegetation is removed from within 20 feet of streams meeting criteria of FPR Table 5 (i.e., no N codes for Veg10).

Comments: The analysis for Table 5 criteria would require GIS-based acreage calculations, and could be time consuming. I performed this analysis for those stream segments with an N code for Veg10 and all of these passed because the contributing watersheds were smaller than specified by Table 5 criteria. Ideally, the population of applicable units would be determined using GIS basin size analysis for all 200 units. However, this would be extremely time consuming. Current analysis methods overestimate the applicable population, but the bottom line is that there are no compliance issues.

Small Type N stream segments are of unequal length. Thus, population size determined from number of stream segments may yield arbitrary results. This applies to other rules that rely on counts of stream segments, as well. An approach standardized to stream segment length would be possible, but would take extra time.

Appendix III - Application-based Noncompliance Summary after 100 units

Rule Number			Description	Number of Applications Noncompliant	Total Count	Percent Compliant
629-605-	170	1a	Written Plan - 100' Streams/Lakes	3	32	91%
629-625-	100	2b	Written Plan- Machinery in Type F or D	0	0	NA
629-625-	100	2c	Written Plan - RMA Road Construction	0	0	NA
629-625-	310	2	Road Design - End Haul Waste Material	92	369	75%
629-625-	310	3	Road Design - Minimize Width	15	752	98%
629-625-	310	4	Road Design - Cut, Fill, & Landslides	10	77	87%
629-625-	310	5	Road Design - Fill Stabilization	0	26	100%
629-625-	320	1bB	Written Plan - Stream Xing Fill >15'	0	0	NA
629-625-	320	1bC	Stream Xings - Prevent Fill Erosion	2	26	92%
629-625	320	2a	Properly Sized Culverts for 50 yr Event	4	15	73%
629-625-	330	2	Road Drainage-Don't focus on hillslopes	3	1307	100%
629-625-	330	3	Road Design - No Stream Diversion	3	120	98%
629-625-	330	4	Road Drainage - Crossing Filtering	20	120	83%
629-625-	330	5	Road Drainage - Springs and Seeps	4	752	99%
629-625-	330	6	Road drainage - avoid gully erosion	3	752	100%
629-625-	410	-	Road Waste - WOS Protection	17	1826	99%
629-625-	420	1	Road Drainage - Clear Ditches (New roads)	0	74	100%
629-625-	420	2	Road Drainage - Effective Crossdrains	9	752	99%
629-625-	420	5	Road Drainage - Remove Berms	0	752	100%
629-625-	430	2	Tracks/ruts in channel: WP for Machine Activity	0	1	100%
629-625-	430	5	Road Temp. Xings - Sediment Barriers	9	9	0%
629-625-	440	1	Road Fill/Sidecast/Waste - Stabilization	3	433	99%
629-625-	440	3	Road Fills - No Logs/Slash	7	375	98%
629-625-	500	2	Rock Pits - Location - Channel Protection	0	11	100%
629-625-	500	3	Rock Pits - Soil/Rock/Petro Out of WOS	0	0	NA
629-625-	500	4	Rock Pits - Prevent Erosion, Landslides	0	0	NA
629-625-	500	5	Rock Pits - Dispose Petro, Waste Mat.	0	11	100%
629-625-	600	2	Road Drainage - Surface Maintenance	32	1405	98%
629-625-	600	3	Road Drainage - Avoid Clogs	1	1405	100%
629-625-	600	5	Road Drainage - No Road Oil to WOS	0	0	NA
629-630-	150	7	Skid Trails - Up Steep Hills	4	1121	100%
629-630-	150	8	Skid Trails - Effective Drainage on Steep Slopes	0	1121	100%
629-630-	200	3	Written Plan - RMA Landings	0	0	NA
629-630-	200	4	Landing - no organic material in fill	13	354	96%
629-630-	300	2	Skid Trail Drainage - Filtering	54	1121	95%
629-630-	300	4	Landing Drainage - Dispersal	2	354	99%
629-630-	400	1	Waste/Slash Location - WOS	44	1543	97%
629-630-	400	3	Petroleum Products - Waste Removal	54	354	85%
629-630-	400	4	Waste Metal - WOS	0	1189	100%
629-630-	600	3b	Slash - Min. in N Stms., Lakes, Wetlands	41	639	94%
629-630-	600	3c	Slash - Place above High Water	28	1189	98%
629-630-	700	3.2	Written Plan - Yarding Corridors	0	3	100%
629-630-	700	4	Yarding Corridors - Keep off Ground	0	30	100%

Rule Number			Description	Number of Applications Noncompliant	Total Count	Percent Compliant
629-630-	800	2	Ground Equipment - Not in Streams	23	1139	98%
629-630-	800	4a	Temp. Xing Design - Min. Sed. To WOS	24	98	76%
629-630-	800	4c	Written Plan - 8' temporary crossing fill	0	0	NA
629-630-	800	4e	Temp. Xing Removal	12	98	88%
629-630-	800	6	Skid Trail Xings - Sediment Barriers	92	94	2%
629-630-	800	8	Skid Trail Loc. - <35' of Strms, runoff filt.	12	163	93%
629-640	100	2b	F RMA - 20' HWM Tree Retention	5	496	99%
629-640	200	2b	D/N RMA - 20' HWL Tree Retention	0	65	100%
629-640	200	6	Veg retention on small N	0	1	100%
629-645	030	1	Machine entry into significant wetlands	0	1	100%
629-655	000	2a	Machine entry into wetlands > 1/4 acre	0	12	100%
629-655	000	3	Machinery entry into wetlands < 1/4 acre	1	38	97%
629-660	040	1	Channelize, relocate, divert streams	23	1493	98%
629-660	040	2	Add/remove material from channel	6	1493	100%

Application-based Compliance Rate by FPA Area

Rule Number	Pooled Applicable Segments		
	Noncomp Segments	Total Segments	Percent Compliant
625-310-2	**92**	**369**	**75.1%**
EOA	2	13	84.6%
NWO	61	210	71.0%
SWO	29	146	80.1%
625-310-3	**15**	**752**	**98.0%**
EOA	0	283	100.0%
NWO	1	303	99.7%
SWO	14	166	91.6%
625-310-4	**10**	**77**	**87.0%**
EOA	0	6	100.0%
NWO	0	32	100.0%
SWO	10	39	74.4%
625-310-5	**0**	**26**	**100.0%**
EOA	0	8	100.0%
NWO	0	9	100.0%
SWO	0	9	100.0%
625-320-1bC	**2**	**26**	**92.3%**
EOA	2	8	75.0%
NWO	0	9	100.0%
SWO	0	9	100.0%
625-320-2a	**4**	**15**	**73.3%**
EOA	2	3	33.3%
NWO	1	5	80.0%
SWO	1	7	85.7%
625-330-2	**3**	**1307**	**99.8%**
EOA	0	224	100.0%
NWO	0	708	100.0%
SWO	3	375	99.2%
625-330-3	**3**	**120**	**97.5%**
EOA	2	21	90.5%
NWO	0	72	100.0%
SWO	1	27	96.3%
625-330-4	**20**	**120**	**83.3%**
EOA	7	21	66.7%
NWO	8	72	88.9%
SWO	5	27	81.5%
625-330-5	**4**	**752**	**99.5%**
EOA	0	283	100.0%
NWO	1	303	99.7%
SWO	3	166	98.2%
625-330-6	**3**	**752**	**99.6%**
EOA	1	283	99.6%
NWO	0	303	100.0%
SWO	2	166	98.8%
625-410	**17**	**1826**	**99.1%**
EOA	8	492	98.4%
NWO	4	887	99.5%
SWO	5	447	98.9%
625-420-1	**0**	**74**	**100.0%**

Application-based Compliance Rate by Ownership

Rule Number	Pooled Applicable Segments		
	Noncomp Segments	Total Segments	Percent Compliant
625-310-2	**92**	**369**	**75.1%**
OTH	4	39	89.7%
PI	70	248	71.8%
PNI	18	82	78.0%
625-310-3	**15**	**752**	**98.0%**
OTH	12	66	81.8%
PI	3	462	99.4%
PNI	0	224	100.0%
625-310-4	**10**	**77**	**87.0%**
OTH	0	6	100.0%
PI	5	38	86.8%
PNI	5	33	84.8%
625-310-5	**0**	**26**	**100.0%**
OTH	0	2	100.0%
PI	0	18	100.0%
PNI	0	6	100.0%
625-320-1bC	**2**	**26**	**92.3%**
OTH	0	2	100.0%
PI	0	18	100.0%
PNI	2	6	66.7%
625-320-2a	**4**	**15**	**73.3%**
OTH	0	1	100.0%
PI	3	13	76.9%
PNI	1	1	0.0%
625-330-2	**3**	**1307**	**99.8%**
OTH	0	141	100.0%
PI	1	902	99.9%
PNI	2	264	99.2%
625-330-3	**3**	**120**	**97.5%**
OTH	0	11	100.0%
PI	1	83	98.8%
PNI	2	26	92.3%
625-330-4	**20**	**120**	**83.3%**
OTH	0	11	100.0%
PI	13	83	84.3%
PNI	7	26	73.1%
625-330-5	**4**	**752**	**99.5%**
OTH	0	66	100.0%
PI	2	462	99.6%
PNI	2	224	99.1%
625-330-6	**3**	**752**	**99.6%**
OTH	0	66	100.0%
PI	2	462	99.6%
PNI	1	224	99.6%
625-410	**17**	**1826**	**99.1%**
OTH	3	192	98.4%
PI	8	1227	99.3%
PNI	6	407	98.5%
625-420-1	**0**	**74**	**100.0%**

Rule Number	Pooled Applicable Segments		
	Noncomp Segments	Total Segments	Percent Compliant
EOA	0	3	100.0%
NWO	0	57	100.0%
SWO	0	14	100.0%
625-420-2	**9**	**752**	**98.8%**
EOA	1	283	99.6%
NWO	5	303	98.3%
SWO	3	166	98.2%
625-420-5	**0**	**752**	**100.0%**
EOA	0	283	100.0%
NWO	0	303	100.0%
SWO	0	166	100.0%
625-430-5	**9**	**9**	**0.0%**
EOA	6	6	0.0%
NWO	2	2	0.0%
SWO	1	1	0.0%
625-440-1	**3**	**433**	**99.3%**
EOA	0	91	100.0%
NWO	2	221	99.1%
SWO	1	121	99.2%
625-440-3	**7**	**375**	**98.1%**
EOA	5	79	93.7%
NWO	2	198	99.0%
SWO	0	98	100.0%
625-500-2	**0**	**11**	**100.0%**
EOA	0	7	100.0%
NWO	0	3	100.0%
SWO	0	1	100.0%
625-500-5	**0**	**11**	**100.0%**
EOA	0	7	100.0%
NWO	0	3	100.0%
SWO	0	1	100.0%
625-600-2	**32**	**1405**	**97.7%**
EOA	8	358	97.8%
NWO	21	631	96.7%
SWO	3	416	99.3%
625-600-3	**1**	**1405**	**99.9%**
EOA	0	358	100.0%
NWO	1	631	99.8%
SWO	0	416	100.0%
630-150-7	**4**	**1121**	**99.6%**
EOA	0	169	100.0%
NWO	1	718	99.9%
SWO	3	234	98.7%
630-150-8	**0**	**1121**	**100.0%**
EOA	0	169	100.0%
NWO	0	718	100.0%
SWO	0	234	100.0%
630-200-4	**13**	**354**	**96.3%**
EOA	0	2	100.0%
NWO	6	207	97.1%
SWO	7	145	95.2%
630-300-2	**54**	**1121**	**95.2%**

Rule Number	Pooled Applicable Segments		
	Noncomp Segments	Total Segments	Percent Compliant
OTH	0	5	100.0%
PI	0	64	100.0%
PNI	0	5	100.0%
625-420-2	**9**	**752**	**98.8%**
OTH	1	66	98.5%
PI	7	462	98.5%
PNI	1	224	99.6%
625-420-5	**0**	**752**	**100.0%**
OTH	0	66	100.0%
PI	0	462	100.0%
PNI	0	224	100.0%
625-430-5	**9**	**9**	**0.0%**
OTH	0	0	NA
PI	4	4	0.0%
PNI	5	5	0.0%
625-440-1	**3**	**433**	**99.3%**
OTH	0	57	100.0%
PI	2	264	99.2%
PNI	1	112	99.1%
625-440-3	**7**	**375**	**98.1%**
OTH	0	50	100.0%
PI	2	240	99.2%
PNI	5	85	94.1%
625-500-2	**0**	**11**	**100.0%**
OTH	0	2	100.0%
PI	0	8	100.0%
PNI	0	1	100.0%
625-500-5	**0**	**11**	**100.0%**
OTH	0	2	100.0%
PI	0	8	100.0%
PNI	0	1	100.0%
625-600-2	**32**	**1405**	**97.7%**
OTH	3	126	97.6%
PI	20	903	97.8%
PNI	9	376	97.6%
625-600-3	**1**	**1405**	**99.9%**
OTH	0	126	100.0%
PI	1	903	99.9%
PNI	0	376	100.0%
630-150-7	**4**	**1121**	**99.6%**
OTH	0	98	100.0%
PI	2	789	99.7%
PNI	2	234	99.1%
630-150-8	**0**	**1121**	**100.0%**
OTH	0	98	100.0%
PI	0	789	100.0%
PNI	0	234	100.0%
630-200-4	**13**	**354**	**96.3%**
OTH	0	45	100.0%
PI	11	249	95.6%
PNI	2	60	96.7%
630-300-2	**54**	**1121**	**95.2%**

Rule Number	Pooled Applicable Segments		
	Noncomp Segments	Total Segments	Percent Compliant
EOA	24	169	85.8%
NWO	12	718	98.3%
SWO	18	234	92.3%
630-300-4	**2**	**354**	**99.4%**
EOA	0	2	100.0%
NWO	1	207	99.5%
SWO	1	145	99.3%
630-400-1	**44**	**1543**	**97.1%**
EOA	8	171	95.3%
NWO	11	961	98.9%
SWO	25	411	93.9%
630-400-3	**54**	**354**	**84.7%**
EOA	0	2	100.0%
NWO	23	207	88.9%
SWO	31	145	78.6%
630-400-4	**0**	**1189**	**100.0%**
EOA	0	169	100.0%
NWO	0	754	100.0%
SWO	0	266	100.0%
630-600-3b	**41**	**639**	**93.6%**
EOA	0	113	100.0%
NWO	28	354	92.1%
SWO	13	172	92.4%
630-600-3c	**28**	**1189**	**97.6%**
EOA	4	169	97.6%
NWO	8	754	98.9%
SWO	16	266	94.0%
630-700-4	**0**	**30**	**100.0%**
EOA	0	0	#DIV/0!
NWO	0	27	100.0%
SWO	0	3	100.0%
630-800-2	**23**	**1139**	**98.0%**
EOA	4	162	97.5%
NWO	8	722	98.9%
SWO	11	255	95.7%
630-800-4a	**24**	**98**	**75.5%**
EOA	14	69	79.7%
NWO	7	17	58.8%
SWO	3	12	75.0%
630-800-4e&625-43	**12**	**98**	**87.8%**
EOA	5	69	92.8%
NWO	7	17	58.8%
SWO	0	12	100.0%
630-800-6	**92**	**94**	**2.1%**
EOA	62	64	3.1%
NWO	19	19	0.0%
SWO	11	11	0.0%
630-800-8	**12**	**163**	**92.6%**
EOA	11	0	NA
NWO	1	163	99.4%
SWO	0	0	NA
640-0100-2b	**5**	**496**	**99.0%**

Rule Number	Pooled Applicable Segments		
	Noncomp Segments	Total Segments	Percent Compliant
OTH	7	98	92.9%
PI	23	789	97.1%
PNI	24	234	89.7%
630-300-4	**2**	**354**	**99.4%**
OTH	1	45	97.8%
PI	1	249	99.6%
PNI	0	60	100.0%
630-400-1	**44**	**1543**	**97.1%**
OTH	11	157	93.0%
PI	21	1092	98.1%
PNI	12	294	95.9%
630-400-3	**54**	**354**	**84.7%**
OTH	5	45	88.9%
PI	43	249	82.7%
PNI	6	60	90.0%
630-400-4	**0**	**1189**	**100.0%**
OTH	0	112	100.0%
PI	0	843	100.0%
PNI	0	234	100.0%
630-600-3b	**41**	**639**	**93.6%**
OTH	5	106	95.3%
PI	36	423	91.5%
PNI	0	110	100.0%
630-600-3c	**28**	**1189**	**97.6%**
OTH	12	112	89.3%
PI	12	843	98.6%
PNI	4	234	98.3%
630-700-4	**0**	**30**	**100.0%**
OTH	0	0	NA
PI	0	30	100.0%
PNI	0	0	NA
630-800-2	**23**	**1139**	**98.0%**
OTH	1	112	99.1%
PI	19	802	97.6%
PNI	3	225	98.7%
630-800-4a	**24**	**98**	**75.5%**
OTH	1	5	80.0%
PI	9	40	77.5%
PNI	14	53	73.6%
630-800-4e&625-43	**12**	**98**	**87.8%**
OTH	0	5	100.0%
PI	7	40	82.5%
PNI	5	53	90.6%
630-800-6	**92**	**94**	**2.1%**
OTH	5	5	0.0%
PI	39	40	2.5%
PNI	48	49	2.0%
630-800-8	**12**	**163**	**92.6%**
OTH	0	0	NA
PI	0	163	100.0%
PNI	12	0	NA
640-0100-2b	**5**	**496**	**99.0%**

Rule Number	Pooled Applicable Segments		
	Noncomp Segments	Total Segments	Percent Compliant
EOA	3	54	94.4%
NWO	2	359	99.4%
SWO	0	83	100.0%
640-0200-2b	**0**	**65**	**100.0%**
EOA	0	0	NA
NWO	0	64	100.0%
SWO	0	1	100.0%
640-0200-6	**0**	**1**	**100.0%**
EOA	0	1	100.0%
NWO	0	0	NA
SWO	0	0	NA
645-030-1	**0**	**1**	**100.0%**
EOA	0	1	100.0%
NWO	0	0	NA
SWO	0	0	NA
655-0000-2a	**0**	**12**	**100.0%**
EOA	0	6	100.0%
NWO	0	5	100.0%
SWO	0	1	100.0%
655-0000-3	**1**	**38**	**97.4%**
EOA	0	1	100.0%
NWO	1	27	96.3%
SWO	0	10	100.0%
660-0040-1	**23**	**1493**	**98.5%**
EOA	14	164	91.5%
NWO	8	929	99.1%
SWO	1	400	99.8%
660-0040-2	**6**	**1493**	**99.6%**
EOA	2	164	98.8%
NWO	3	929	99.7%
SWO	1	400	99.8%

Rule Number	Pooled Applicable Segments		
	Noncomp Segments	Total Segments	Percent Compliant
OTH	0	6	100.0%
PI	2	385	99.5%
PNI	3	105	97.1%
640-0200-2b	**0**	**65**	**100.0%**
OTH	0	16	100.0%
PI	0	35	100.0%
PNI	0	14	100.0%
640-0200-6	**0**	**1**	**100.0%**
OTH	0	0	NA
PI	0	0	NA
PNI	0	1	100.0%
645-030-1	**0**	**1**	**100.0%**
OTH	0	0	NA
PI	0	0	NA
PNI	0	1	100.0%
655-0000-2a	**0**	**12**	**100.0%**
OTH	0	0	100.0%
PI	0	7	100.0%
PNI	0	5	100.0%
655-0000-3	**1**	**38**	**97.4%**
OTH	0	0	NA
PI	1	34	97.1%
PNI	0	4	100.0%
660-0040-1	**23**	**1493**	**98.5%**
OTH	14	157	91.1%
PI	8	1051	99.2%
PNI	1	285	99.6%
660-0040-2	**6**	**1493**	**99.6%**
OTH	2	157	98.7%
PI	3	1051	99.7%
PNI	1	285	99.6%

Unit compliance summary after 100 units

Rule Number			Description	Non-compliant Count	Applic-able Count	Percent Compliant
629-605-	170	1a	Written Plan - 100' Streams/Lakes	3	32	91%
629-625-	100	2b	Written Plan- Machinery in Type F or D	Included above		N/A
629-625-	100	2c	Written Plan - RMA Road Construction	Included above		N/A
629-625-	310	2	Road Design - End Haul Waste Material	22	50	56%
629-625-	310	3	Road Design - Minimize Width	4	59	93%
629-625-	310	4	Road Design - Cut, Fill, & Landslides	2	20	90%
629-625-	310	5	Road Design - Fill Stabilization	0	16	100%
629-625-	320	1bB	Written Plan - Stream Xing Fill >15'	0	0	N/A
629-625-	320	1bC	Stream Xings - Prevent Fill Erosion	2	16	88%
629-625	320	2a	Properly Sized Culverts for 50 yr Event	5	9	56%
629-625-	330	2	Road Drainage-Don't focus on hillslopes	3	89	97%
629-625-	330	3	Road Design - No Stream Diversion	2	51	96%
629-625-	330	4	Road Drainage - Crossing Filtering	13	51	75%
629-625-	330	5	Road Drainage - Springs and Seeps	3	59	95%
629-625-	330	6	Road drainage - avoid gully erosion	3	59	95%
629-625-	410	-	Road Waste - WOS Protection	8	74	89%
629-625-	420	1	Road Drainage - Clear Ditches (New roads)	0	20	100%
629-625-	420	2	Road Drainage - Effective Crossdrains	6	59	90%
629-625-	420	5	Road Drainage - Remove Berms	0	59	100%
629-625-	430	2	Tracks/ruts in channel: WP for Machine Activity	0	1	100%
629-625-	430	5	Road Temp. Xings - Sediment Barriers	6	6	0%
629-625-	440	1	Road Fill/Sidecast/Waste - Stabilization	3	53	94%
629-625-	440	3	Road Fills - No Logs/Slash	2	50	96%
629-625-	500	2	Rock Pits - Location - Channel Protection	0	7	100%
629-625-	500	3	Rock Pits - Soil/Rock/Petro Out of WOS	0	0	N/A
629-625-	500	4	Rock Pits - Prevent Erosion, Landslides	0	0	N/A
629-625-	500	5	Rock Pits - Dispose Petro, Waste Mat.	0	7	100%
629-625-	600	2	Road Drainage - Surface Maintenance	14	83	83%
629-625-	600	3	Road Drainage - Avoid Clogs	1	83	99%
629-625-	600	5	Road Drainage - No Road Oil to WOS	0	0	N/A
629-630-	150	7	Skid Trails - Up Steep Hills	3	70	96%
629-630-	150	8	Skid Trails - Effective Drainage on Steep Slopes	0	70	100%
629-630-	200	3	Written Plan - RMA Landings	0	0	N/A
629-630-	200	4	Landing - no organic material in fill	9	74	88%
629-630-	300	2	Skid Trail Drainage - Filtering	16	70	77%
629-630-	300	4	Landing Drainage - Dispersal	2	74	97%
629-630-	400	1	Waste/Slash Location - WOS	21	88	76%
629-630-	400	3	Petroleum Products - Waste Removal	31	74	58%
629-630-	400	4	Waste Metal - WOS	0	76	100%
629-630-	600	3b	Slash - Min. in N Stms., Lakes, Wetlands	17	67	75%
629-630-	600	3c	Slash - Place above High Water	14	76	82%
629-630-	700	3.2	Written Plan - Yarding Corridors	0	3	100%
629-630-	700	4	Yarding Corridors - Keep off Ground	0	7	100%
629-630-	800	2	Ground Equipment - Not in Streams	11	74	85%
629-630-	800	4a	Temp. Xing Design - Min. Sed. To WOS	11	27	59%
629-630-	800	4c	Written Plan - 8' temporary crossing fill	0	0	N/A
629-630-	800	4e	Temp. Xing Removal	10	27	63%
629-630-	800	6	Skid Trail Xings - Sediment Barriers	26	26	0%
629-630-	800	8	Skid Trail Loc. - <35' of Strms, runoff filt.	2	7	71%

Rule Number			Description	Non-compliant Count	Applic-able Count	Percent Compliant
629-640	100	2b	F RMA - 20' HWM Tree Retention	2	33	94%
629-640	200	2b	D/N RMA - 20' HWL Tree Retention	0	6	100%
629-640	200	6	Veg retention on small N	0	1	100%
629-645	030	1	Machine entry into significant wetlands	0	1	100%
629-655	000	2a	Machine entry into wetlands > 1/4 acre	0	7	100%
629-655	000	3	Machinery entry into wetlands < 1/4 acre	1	16	94%
629-660	040	1	Channelize, relocate, divert streams	10	87	89%
629-660	040	2	Add/remove material from channel	6	87	93%