

**Oregon Department of Forestry
Forest Practices Compliance Audit
2013**



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COMMITTEES AND COORDINATORS

This study has oversight by external and internal review committees. The committees' 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 committees met throughout the development of the project and will continue to meet as needed.

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Compliance Audit Report: 2013

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). ODF was specifically directed to contract with a third party to conduct the audit. Because of this requirement, protocols needed to be finalized well before the beginning of the study and only quantifiable rules were selected for evaluation. The 2013 compliance audit focused on harvest and road rules, and water protection rules. Contractors collected data at 200 sites harvested between 2010-2012 and provided ODF with compliance data, photographs, and notes. ODF used database and Geographic Information System (GIS) software to analyze the data and make calls of “apparent” compliance or non-compliance. Analysis of compliance rates focused on events causing impacts to resources.

For purposes of this analysis, the state was subdivided geographically into FPA administrative areas (Eastern Oregon Area, Northwest Oregon Area, and Southern Oregon Area). Additionally ownership was divided into Private Industrial, Private Non-industrial, and Other classes. The Other class was comprised of governmental entities, including state and county forests.

The 2013 compliance audit resulted in an overall rule-level compliance rate of 97% (95% confidence interval = 96% - 97%). Compliance was highest in the Northwest Oregon Area and in the Other ownership type. Relative compliance between FPA areas and ownership types varied by rule.

	Percent compliant
Overall	96% (96% – 97%)
FPA Area	
Eastern Oregon Area	96%
Northwest Oregon Area	98%
Southern Oregon Area	95%
Ownership Class	
Other	98%
Private Industrial	96%
Private Non-industrial	94%

At a rule division basis, compliance was generally high. The highest compliance was found with rules dealing with vegetation retention along streams. The lowest compliance was for protection of “Other Wetlands”. This may indicate a need for further emphasis on small wetlands, although this rule division had a small sample size. Some rules for written plans also had lower compliance rates. This may be due to the operation covering a different area than expressed in the notification, mapping errors or an altered scope of operation, the affected resource triggering a written plan was not recognized by operators, or due to ODF database inaccuracies.

Rule Division		Percent Compliant
Several	Written plans	75%
625	Road Construction and Maintenance	97%
630	Harvesting	95%
640	Vegetation Retention Along Streams	98%
655	Protection for “Other Wetlands”	72%
660	Operations Near Waters of the State	99%

Introduction:

The Oregon Department of Forestry (ODF) regulates forestry operations on non-federal land by means of the Forest Practices Act Statutes and Rules. Landowners and operators are subject to the Forest Practices Act Statutes and Rules when they conduct any commercial activity related to the growing or harvesting of trees. The Oregon Forest Practices Act (FPA) was adopted in 1972. The overarching objective of the Act is to

...encourage 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)

Forest Practice Rules were developed to implement the objective of the FPA and are contained in Oregon Administrative Rules chapter 629. The ODF Private Forests Program is responsible for administering and monitoring the Forest Practice Rules. Compliance monitoring is used by ODF to assess the degree to which landowners and timber operators are following the provisions of the Forest Practice Rules. The results of compliance monitoring are used to inform ODF training programs and administration of Forest Practice Rules on the ground.

History of Compliance Monitoring

Between 1998 and 2000, the ODF Forest Practices Monitoring Program implemented the BMP Compliance Monitoring Project (BMPCMP). This was a three-year project designed primarily to look at how ODF, landowners, and operators were implementing the Forest Practice Rules related to water quality. The goal of the BMPCMP was to identify the level of forest operations in compliance with the Forest Practice Rules based on a statistically reliable sample and to determine if adjustments to the administration of the compliance program were needed. This project was conducted entirely by ODF employees. Results were summarized in a 2002 report¹.

In 2011, the Oregon Legislature (2011 Legislative Session-Budget Note #1) directed ODF to audit rates of compliance with Forest Practices Act standards. In contrast with the BMPCMP study, this work was to be conducted by contractors. These contractors were to be responsible for

¹ Oregon Department of Forestry Best Management Practices Compliance Monitoring Project: Final Report. April 2002. 75 pp. <http://www.oregon.gov/odf/privateforests/docs/bmpfinaltr15.pdf>.

collecting field data, but were not to make compliance calls in the field. ODF retained responsibility for interpreting field data collected by the contractors.

Methods:

The 2013 compliance audit focused on harvest and road rules. The study design was prepared to answer the following monitoring questions:

1. How often did operators comply with the Forest Practice 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. How do compliance patterns compare to those stated in the 2002 report?

Contractors collected data at 200 sites in all three Areas (Figure 1). The number of sites chosen from each Area were proportional to the total number of units for which notifications of proposed forest operations were received. This resulted in 45% of units being chosen in each of the Northwest and Southern Oregon Areas, while 10% of units were chosen from the Eastern Oregon Area (Table 1).

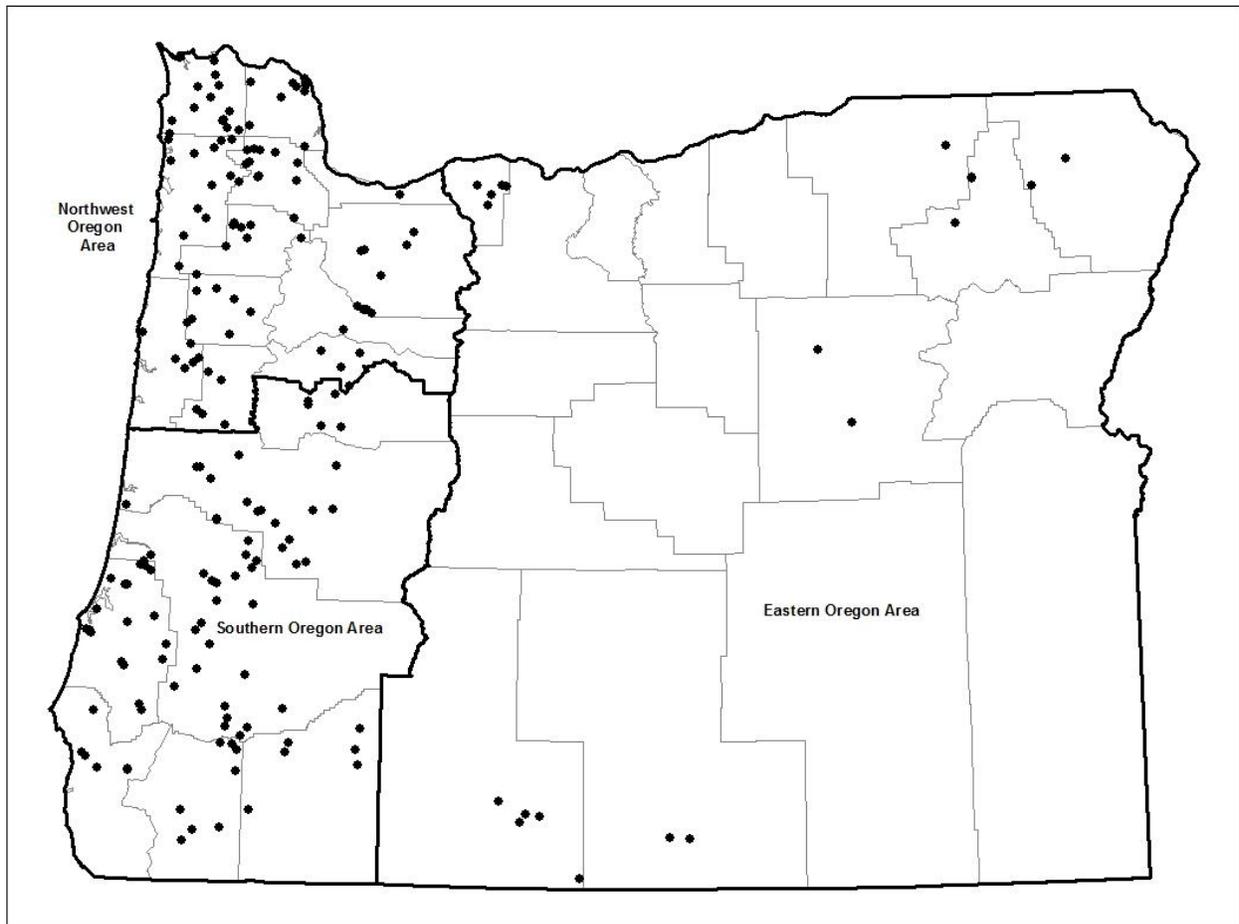


Figure 1. Locations of units surveyed for 2013 compliance audit.

The number of sites chosen from each Area were also stratified by ownership class (Table 1). Ownership was classified into three groups:

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

Area	Total units visited	Landowner Class		
		PI	PNI	Other
Eastern Oregon	20	8	6	6
Northwest Oregon	90	32	18	40
Southern Oregon	90	38	17	35
Total	200	78	41	81

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

Notification numbers were randomly chosen from the Forest Activities Notification System (FACTS) database for each Area and ownership class. Landowners were then contacted for access permission. Approximately 54% of landowner contacts resulted in access permission to suitable sites. When a site was found to be unsuitable, or landowner permission could not be obtained, replacement sites were chosen using the same random process. Sites were deemed unsuitable if landowners refused access or did not respond to ODF inquiries, harvest did not occur or was currently underway, or other reasons (Table 2). These other reasons included notification for non-commercial harvests, ownership changes, and land conversions. Data for Table 2 may be incomplete due to changes in information retention following alterations of permission procedures.

Ownership	Number of Inquiries	Permission Granted	No Response	Landowner Refusal	Did Not Operate	Active Harvest	Other Reasons
PI	114	77 (60%)	5 (4%)	5 (4%)	9 (6%)	2 (2%)	16 (14%)
PNI	142	42 (30%)	32 (23%)	16 (11%)	20 (14%)	1 (1%)	31 (22%)
Other	128	88 (69%)	5 (4%)	5 (4%)	9 (7%)	4 (3%)	17 (13%)
Total	384	207 (54%)	42 (11%)	26 (7%)	38 (10%)	7 (2%)	64 (17%)

Table 2. Landowner permission success and failure rates by landowner type. More than 200 permissions were obtained but only 200 permissions were used in the study.

The directive to use contractors for fieldwork affected project design. ODF selected a subset of quantifiable rules for evaluation, and then designed a field protocol that emphasized quantitative measurements and identification of specific conditions. The contractors submitted raw data to ODF. ODF monitoring team members then conducted a quality control field check on 10% of surveyed units. Once data quality met acceptable standards, ODF used database and GIS software to analyze the data. The software performed logical queries to determine the number of applications (landings, stream segments, road segments) at which rules applied and whether observed practices appeared to be noncompliant. The audit assesses “apparent compliance” with rules; contractors provided data on measured site conditions and ODF used those data to assess rules.

In practice, ODF Stewardship Foresters assess actual compliance or non-compliance with rules and respond in a variety of ways to what they find on a given site. Reported compliance rates should be interpreted in this document as apparent compliance rates.

Apparent noncompliance was generally assessed based on unsatisfactory conditions (e.g., road gullyng) that also appeared to be causing resource impacts. These impacts included the following conditions:

1. Ongoing or imminent delivery of sediment or organic debris to Waters of the State. This was the criterion used in most rules.
2. Metallic waste and petroleum products in Waters of the State.
3. Petroleum products left in the forest.
4. Stream channel disturbance.
5. Loss of shade or other riparian functions.
6. Disrupted hydrology.

Some forest operations trigger the need for a written plan to be submitted with the notification. Written plans provide Stewardship Foresters with the opportunity to comment of potential resource impacts. A denial of this opportunity is considered sufficient to establish noncompliance in these cases. This would be administrative noncompliance as opposed to noncompliance linked to actual natural resource impacts.

A list of the assumptions used in determining apparent noncompliance and applicable populations is given in Appendix 1.

Once the list of noncompliant events and applicable populations was determined, numbers were summarized by total number of applications and by unit. Statistical calculations were performed based on the total number of applications.

Results:

Rule level compliance

Rule-Level compliance rates are given in Table 2. 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 applications. On this basis, compliance is 97%, with a 95% confidence interval between 96% and 97%. Rule level compliance is highest in the Northwest Oregon Area. At an individual rule level, these geographical relationships seem to hold up, with the Northwest Oregon Area generally showing higher compliance than the Southern Oregon Area for most rules (Appendix 2). The Eastern Oregon Area is quite variable, and interpretation is often complicated by small sample size.

Number of Rule Applications			
	Not Compliant	Applicable	Proportion Compliant
Overall	1948	55,575	96%
Eastern Oregon Area	132	3461	96%
Northwest Oregon Area	565	26,835	98%
Southern Oregon Area	1251	25,279	95%

Table 2. Rule level compliance based on pooled data (total number of times a rule applied).

Differences between the Northwest Oregon Area and Southwest Oregon Area were especially pronounced on rules dealing with roads on steep slopes (OAR 629-625-310(2) and 310(4)), equipment in streams (OAR 629-630-800(2)), and filtering of skid trail drainage (OAR 629-630-300(2)).

Compliance rates are broken down by ownership class in Table 3. Rule level compliance is highest for the Other ownership class. Although the pooled data in this table shows the Private Nonindustrial class as having the lowest compliance rate, the picture at an individual rule level was much more variable. On specific rules, the Private Nonindustrial class often had the highest compliance rate. As with FPA administrative Area, small sample size frequently complicated comparisons between the Private Nonindustrial and other ownership classes.

Number of Rule Applications			
	Not Compliant	Applicable	Proportion Compliant
Overall	1948	55,575	96%
Other	479	21,905	98%
Private Industrial	1213	29,176	96%
Private Nonindustrial	256	4,494	94%

Table 3. Rule level compliance by ownership class.

Differences between the Other and Private Industrial classes were especially pronounced for rules dealing with slash in and near streams (OAR 629-630-600(3)(b) and (3)(c)). This may be explained by the larger buffers left on State Forest land, which composes 52% of the Other class. The Other class also had higher compliance with placement of effective cross drains (OAR 629-625-420(2)).

Table 3 shows compliance totals broken down by rule division. (Section 605 is assessed separately in the section devoted to written plan rules and administrative compliance.) Although compliance rates are high for most rule divisions, they are notably lower for “other wetlands”. Signs of operational activity were frequently observed in very small wetland areas much smaller than ¼ acre in size. However, the sample size for this rule division was much smaller than for most others.

		Number of Rule Applications		
Rule Division	Description	Noncompliant	Total	Proportion Compliant
625	Road Construction and Maintenance	582	20,941	97%
630	Harvesting	1251	25,371	95%
640	Vegetation Retention Along Streams	13	844	98%
655	Protection for “Other Wetlands”	13	46	72%
660	Operations Near Waters of the State	81	8276	99%

Table 3. Compliance by rule division.

Rules in Division 625, road construction and maintenance, had a relatively high compliance rate of 98%. Rule subsection 500, dealing with rock pits, had perfect compliance, but with a small sample size. Rules dealing with road drainage generally exceeded 98% compliance. However, drainage structures were not as functional as this statistic implies. Gullies were observed on

26% of road segments, while 43% of culverts were partially or completely blocked. Only those roads and culverts that connect to streams were considered in the compliance rates. The lowest compliance rate for division 625 (20%) had to do with removal of temporary crossings at roads. Another road drainage rule with low compliance (74%) was OAR 629-625-330(4), which specifies effective filtering at stream crossings. Road design rules dealing with end hauling of waste material and stable cuts and fills also had relatively low compliance levels (Appendix 2).

Division 630, harvesting, had a compliance rate of 95%. Relatively high compliance (99%+) was found for drainage dispersal at landings and for keeping waste metal out of waters of the state. The lowest compliance was found for rules dealing with skid trail temporary stream crossings. These had a composite compliance rate of 61%. Rules dealing with slash in non-fish bearing (Type N) streams and petroleum waste at landings also had relatively low compliance. Petroleum waste, such as grease tubes, was commonly found at units that were otherwise compliant.

Division 640, vegetation retention, had a high compliance rate of 98%. Compliance focused on tree retention within 20 feet of the stream; no riparian areas were cruised to assess compliance with basal area retention standards. Tree retention along Type F (fish-bearing) streams exceeded that along Type D and Large and Medium Type N streams, but all exceeded 96% compliance.

Division 655, protection for Other Wetlands, had the lowest compliance rate of any Division. Compliance with rules prohibiting machinery entry into wetlands <1/4 acre was particularly low at 68%.

Division 660, operations near waters of the state, received a high compliance rate of 99%. This was largely a function of the large number of stream segments in the applicable population. While there were 81 cases of small N streams that had been relocated or had soil material added or removed, these were a small proportion of all surveyed stream segments.

Appendix 2 shows tables broken down by individual rule. There is increased variability in compliance rates at the individual rule level relative to the average of all rules in a Division as described by the preceding tables.

Administrative Compliance: Written plans

Compliance rates for written plans are given in Table 4. Written plans were evaluated for each condition that triggered a rule requiring a written plan. Thus, a single written plan could satisfy one rule while failing to address another. Overall, 75% of applications requiring written plans were compliant.

Several rules governing operations within 100 feet of a stream were coded similarly on our data sheet, and thus were grouped together in analysis. These rules composed the majority of written plans, and had an overall compliance rate of 83%. The absence of a written plan in these cases appeared to be due to one of two reasons:

1. The operation covered a different area than expressed in the notification. This may be the result of poor mapping or an altered scope of operation; or
2. The affected resource was not recognized by operators or due to ODF database inaccuracies.

Rules	Type	WP compliant	No WP/does not address issue	% Compliant
629-605-170-1a 629-625-100-2b 629-625-100-2c	Operations within 100 feet of certain WOS	40	8	83%
629-630-200-3	Landing in RMA	0	4	0%
629-625-430-2	New stream crossings	3	0	100%
629-625-320-1b(B)	Stream crossings >15 feet	1	2	33%
629-630-800-4c	Temp crossings >8 feet	0	1	0%
629-630-700-3.2	Yarding in RMA	1	0	100%

Table 4. Compliance with written plans. One compliance application was possible for each rule type relevant to a given unit. WOS – Waters of the state.

Sample size on other rules was too small to draw definitive conclusions on compliance rates. This condition was complicated by the fact that road construction was often performed using a different notification number than the timber harvest. Additionally, non-statutory written plans may be waived at the Stewardship Forester’s discretion. ODF staff associated with the compliance audit may not have had records of these waivers.

Unit-level compliance.

Compliance was summarized for each of the surveyed 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 achieved a given compliance level. For example, 82 units ranged from 96-100% compliance.

Compliance rates for individual units ranged from 81%-100% and averaged 97%. Median compliance was 98%. Thirty percent of units fully complied with all pertinent rules.

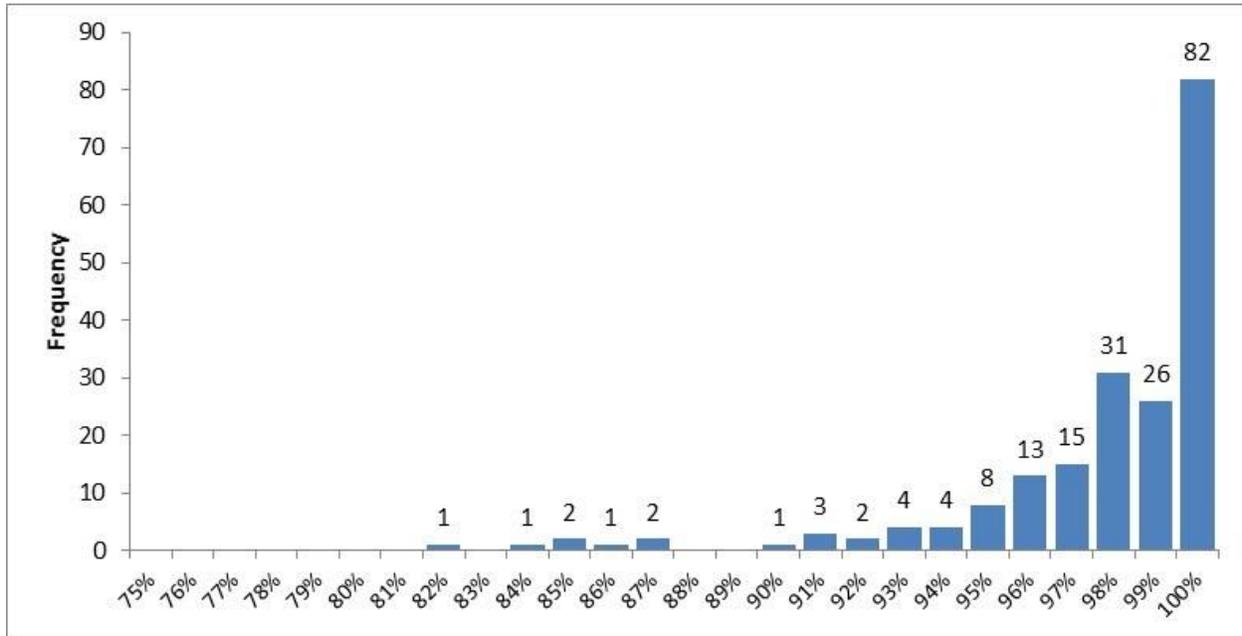


Figure 2. Frequency distribution of unit compliance rates

Scale of resource impacts

The scale of resource impacts caused by sediment delivery was generally quite small. Of 313 events contributing sediment to Waters of the State, 75% contributed less than 1 cubic yard of sediment (Figure 3). These events frequently involved trace amounts of sediment found in or adjacent to streams. The five events that contributed more than 10 cubic yards of sediment were associated with roads. The one event exceeding 100 cubic yards was associated with a sidecast failure on a steep slope.

The bulk of this delivery was to small water bodies. In 94% of these cases, sediment was delivered to Small N streams. Delivery to wetlands <1/4 acre accounted for another 3%. Less than 2% of sediment events happened in all fish-bearing waters combined. Each of these events contributed less than 1 cubic yard of sediment.

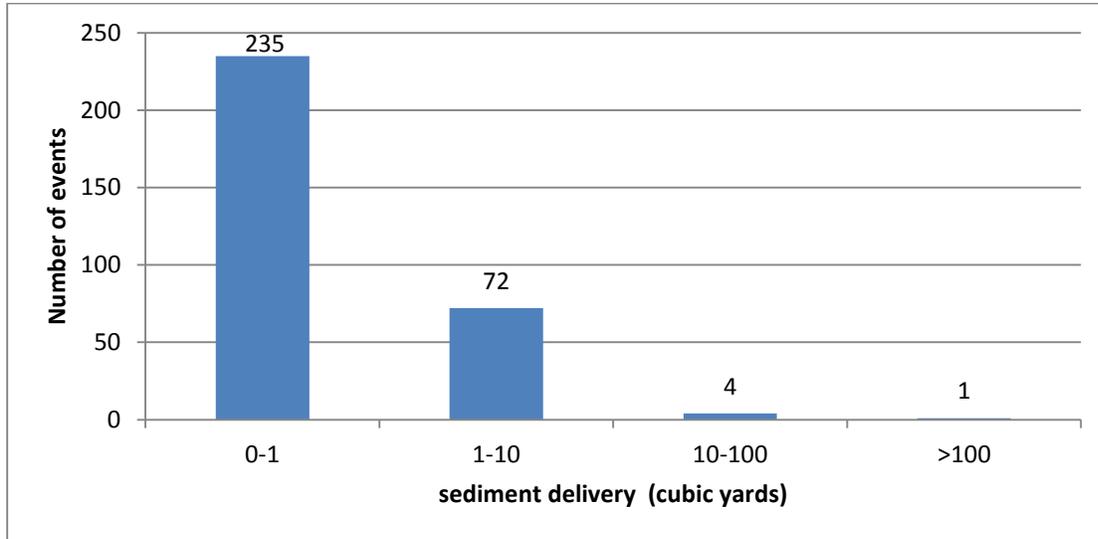


Figure 3. Size of events delivering sediment to Waters of the State

Like sediment delivery, impacts from organic material in streams were concentrated in smaller water bodies. Ninety eight percent of compliance issues related to slash in or near streams occurred on Small N streams. Many of these were seasonal streams with high gradients. Wetlands under $\frac{1}{4}$ acre were responsible for another 1% of slash events. On only one occasion was slash observed in a fish-bearing body of water. This occurred on a small fish-bearing lake.

Grease tubes and other petroleum containers were left on 8% of landings. These were generally found on landings far from any Waters of the State. Potential short-term impacts to these Waters were of low concern. Nevertheless, these containers are considered petroleum waste and their removal is required by the Forest Practice Rules.

Comparison with 2002 figures

Because of methodological differences, it is difficult to quantitatively compare the 2013 findings with those from the 2002 report. However, qualitative comparison indicates that many of the compliance issues identified in 2002 continue to have relatively low compliance in 2011 and 2012. These include issues related to removal of temporary crossings, slash piling near Waters of the State, removal of petroleum-related waste, protection of Other Wetlands, and fill erosion at stream crossings. Missing and inadequate written plans were an administrative concern in both studies. Road surface drainage issues continued to be a concern in the 2013 study, although they generally did not result in resource damage.

Certain rules that exhibited high compliance rates in the 2002 report typically continued to score highly in 2013. These rules included vegetation retention for Type N and D streams and

rules related to rock pits. There were two areas where compliance either gained or lost ground in 2013. The one rule governing cable yarding near Waters of the State that we examined (OAR 629-630-700(4)) scored at the median value of 98% in 2013 versus 90% in 2002. Rules related to road prism design became areas of relatively low compliance, varying from 90-93% compliance versus 99% compliance in 2002.

Sediment delivery is far more skewed toward low-volume events than was reported in 2002. This may indicate that the current survey methodology is more prone to pick up low volume events than was the previous study. Alternatively, there may be a reduction in size of the average sediment producing event. This could reflect improved forest practices that, while not reducing the number of sediment events, is reducing the impacts from those events. During quality control field checks, ODF staff frequently observed sediment control structures that were partially effective at keeping sediment from Waters of the State. Improvements in design and construction of sediment control structures may be sufficient to bring future operations into compliance.

Discussion:

The data presented in this report reflect a significant period of change for the forest industry and the Department due to the last economic recession. The units surveyed during the 2013 compliance audit reflect a period of forest activity when the number of Stewardship Foresters was only beginning to recover from sharp staff reductions in 2009. The low number of Stewardship Foresters resulted in a reduced capacity to conduct field inspections. Recent increases in the numbers of Stewardship Foresters, along with organizational changes, have resulted in an increase in the number of inspections. There is a need to educate new Stewardship Foresters in consistent and effective application of these rules. To meet that need, the ODF Private Forests Division hired a training coordinator in 2012 and training activities are underway. In particular, the Department has a goal of integrating Compliance Audit field visits with Stewardship Forester training. The demands of completing quality assurance checks and contractor payments in a timely fashion has made it challenging to fully integrate training into this process. The 2014 audit will afford another opportunity to explore an improved model of integrating training into the audit process. Particular focus will be given to priority areas discussed below.

While the Stewardship Forester can provide input on field application of Forest Practice Rules, information on effective BMP design may also be conveyed to landowners and operators by educational institutions and professional organizations. ODF will utilize existing partnerships

with OSU, AOL, and other professional groups to provide classes on the priority areas identified in this report.

Emphasis areas for educational activities include the following:

- Identification of small water bodies.
 - Small N streams. Many operations occur near stream initiation points. These streams may not be recognized, particularly under dry conditions. Improved standardization of methods for determining stream initiation is important.
 - Small wetlands. Increased education and awareness of the presence of wetlands less than $\frac{1}{4}$ acre may reduce their susceptibility to mechanical entry.
- Effective removal of temporary crossings on roads. 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 were warranted on remaining fill materials.
- Effective removal of temporary crossings on skid trails. Skid trails often crossed very small Type N streams but exhibited lower compliance rates.
- Effective drainage and filtration techniques upslope of stream crossings. In many cases, efforts at drainage ditches and waterbars were made, but these were often constructed ineffectively.
- Effective road maintenance and construction techniques on steep terrain. Unstable sidecast and fill was frequently observed in steep terrain, particularly in Southwest Oregon. Increased emphasis on practices related to endhauling and construction of stable fills could reduce the sidecast failures observed in this terrain.

Other areas that can reduce the potential risk to waters of the state include:

- Removal of petroleum products from the forest. Grease tubes were commonly found at landings. Although they did not pose an immediate water quality hazard, they could potentially have long-term impacts.
- Road maintenance. Gullies and blocked drains were frequently observed on the forest. Although these usually did not contribute sediment to streams, effective road maintenance is necessary to prevent future resource impacts.

On a final note, one of the largest problems in assessing compliance with written plan requirements was finding the proper notification for road building activities that applied to a given timber harvest unit. This difficulty occurred because road construction was often performed using different notifications than was the harvest. A spatially based notification system (FERNS) is being developed by ODF. This is likely to improve the management of notification information for statewide projects like the Compliance Audit.