[redacted]

Joelle Gore, Acting Chief
Coastal Programs Division (N/ORM#)
Office of Ocean and Coastal Resources Management
National Ocean Services, NOAA
1305 East-West Highway
Silver Spring, MD 20910
joelle.gore@noaa.gov

March 18, 2014

Dear Ms. Gore,

[redacted], a non-profit organization whose mission is to protect environmental health, writes to support EPA and NOAA's proposed disapproval of Oregon's Coastal Nonpoint Pollution Control Program. Oregon does not have a program in place to control nonpoint source pollution in its coastal watersheds that is sufficient to carry out the CZARA management measures and the additional management measures the law requires to achieve and maintain Oregon's water quality standards and protect Oregon's designated uses.

Our comments below address the inadequacies of Oregon's existing program to implement the required CZARA management measures, its inability and disinterest in evaluating the sufficiency of those management measures to ensure pesticides do not violate Oregon's water quality standards and impair its designated uses, its lack of a monitoring program to support such an evaluation, and its lack of practices that protect those designated uses.

[redacted] recently analyzed three years of herbicide spray application records. This analysis is the first in-depth look at private, industrial forestry pesticide application records in the State of Oregon. *Oregon's Industrial Forests and Herbicide Use: A Case Study of Risk to People, Drinking Water and Salmon*, can be found at: http://www.beyondtoxics.org/work/pesticide-reform/forestry-pesticide-project/. The executive summary of this report is Attachment A. A copy of the full report is included in the attached CD.

Under the Oregon Forest Practices Act pesticide spray application records are not available to the public. Spray records are kept by the applicator. The law specifies that only the State Forester may request the actual spray application records.

[redacted]

[redacted] was able to obtain the herbicide spray application records used in our analysis only after the Oregon Health Authority (OHA) made a public records request for all forestry herbicide application records in the *Hwy 36 Corridor Public Health Assessment Highway 36 Corridor Exposure Investigation* (Oregon Health Authority, 2013). This investigation was undertaken because of numerous human health complaints and concerns about contamination of drinking water from rural residents in Oregon's coastal regions. The Exposure Investigation began after the finding of 2,4D and Atrazine in 100% of over 40 urine samples taken from residents living along the Highway 36 corridor near Triangle Lake.

[redacted] report is relevant to EPA and NOAA's proposed disapproval of Oregon's Coastal Nonpoint Pollution Control Program. The report findings demonstrate that the Oregon Forest Practices Act (FPA) lacks any program to protect Oregon streams and their beneficial uses:

- <u>Surface waters are not protected.</u> Unlike Oregon's neighboring states, Washington and Idaho, the Oregon FPA lacks protective pesticide buffers for non-fish perennial streams and intermittent streams that are flowing during time of application (Oregon Forest Resources Institute, 2011) [see Table 5-2, page 100; Table 2-14, page 29]. For example, both Washington and Idaho require a 25-foot no-pesticide buffer for ground sprays and a 50 to 100-foot buffer for aerial sprays for all streams when surface water is present [redacted] 2013) [see p. 64]. As a result, in Oregon non-fish streams (headwaters and tributaries) that flow directly into ESA-listed salmon streams are being sprayed during aerial and/or ground sprays that are carried out during private and state forestry operations. Other aquatic species are another reason for protecting non-fish surface waters. Amphibians that live in streams within clearcuts in the Oregon Coastal Range are in decline and have become a management concern (Kluber, Olson, & Puettmann, 2008). Amphibians are particularly vulnerable to absorbing toxins since they have moist, permeable skin and unshelled eggs that are directly exposed to soil and water (Blaustien, Romansic, Kiesecker, & Hatch, 2003). Longtime rural residents consistently report that native crawfish populations have nearly vanished from streams in the past decade.

- <u>Chemical "tank mixes' create unknown risks from synergistic interactions</u>. Industrial forest aerial spray applications tend to have two to three herbicides plus adjuvants mixed together in one tank (Beyond Toxics, 2013) [see pp. 12-16]. Oregon lacks a monitoring program for rivers, streams, lakes and drinking water resources to measure the presence of multiple chemicals and to better understand the potential for synergistic interactions for endangered species and Oregon residents. Research suggests that mixing chemicals can

lead to synergistic effects. Chemicals applied in a mix can interact with each other, which may result in more harmful environmental effects than when applied individually (Laetz, 2009) (Hayes, 2006). In other words, the effects of synergistic doses cannot be predicted by the effects observed at single doses. Consequently, the impacts to people, fish and other organisms, and drinking water from these tank mixes are not clearly understood and they cannot be considered scientifically sound practices.

This is not consistent with Oregon water quality standard OAR 340-041-0033(1):

> *"Toxic substances may not be introduced above natural background levels in waters of the state in amounts, concentrations, or combinations that may be harmful, may chemically change to harmful forms in the environment, or may accumulate in sediments or bioaccumulate in aquatic life or wildlife to levels that adversely affect public health, safety, or welfare or aquatic life, wildlife, or other designated beneficial uses."*

- <u>Oregon lacks adequate protection for fish-bearing streams and public drinking water than other states in the Northwest.</u> Compared to other states with similar timber stands and climate, Oregon has <u>smaller no-spray buffer zones for protected resources.</u> Washington and Idaho both determined no-spray buffers below 100-foot does not prevent chemicals from entering streams. Washington also recognizes other factors, such as site characteristics, nozzle size and weather conditions, can influence drift and uses these factors when defining the width of a no-spray buffer. Aerial spray buffers range between 100 and 325-foot in Washington (Washington Department of Natural Resources, 2009). Oregon's 60-foot no-spray buffer along fish streams is inadequate. Oregon must be required to develop a protective water quality program that prevents pesticides from entering streams with verifiable criteria. These criteria must take into account the characteristic geographic and weather patterns of the Oregon coastal range tending to result in chemical drift, volatilization and re-volatilization. Water quality sampling in tributaries to the Siuslaw River conducted in 2011 detected levels of forestry herbicides atrazine and its metabolites along with hexazinone within Coho salmon streams (Beyond Toxics, 2013) [see pp. 52-56].

- <u>Oregon has no program to determine the presence of forestry pesticides in the air and resulting in drift and deposition onto surface waters and soils.</u> Volatilization occurs when pesticide surface residues change from a solid or liquid to a gas or vapor; re-volatilization occurs when the change to a gas or

vapor occurs over days during diurnal cycles of heating and cooling of vegetation and soils. Aerial drift and deposition from volatilization and re-volatilization are nonpoint sources of pesticide pollution. Weather along the Oregon coast is frequently patterns of high winds and fog that moves in and out of coastal valleys as the ground heats and cools; rural residents consistently report drift and re-volatilization of pesticides and olfactory detection of chemicals in foggy conditions. Deposition from drift, volatilization and re-volatilization are likely occurring and must be managed as sources of nonpoint pesticide pollution unique to Oregon's coastal region.

- Herbicides can persist in water and can bind with soil particles. For example the U.S. EPA (2007) Chemical Summary of Atrazine states "atrazine persists in surface and ground water with a half-life of longer than 6 months" and "atrazine persistence in soil generally ranges from 14-109 days, though in some soils can persist to at least 4 years." Under the Oregon FPA, pesticides such as atrazine are being aerially sprayed directly into surface waters and into dry channels, including headwaters and tributaries. If a channel is dry during application the herbicide can bind with the soil particles and eventually run off downstream into fish streams during wetter months.

- Oregon lacks a program to protect groundwater and drinking water. Washington State provides a good example for groundwater protection. Washington specifically bans certain chemicals (Atrazine, Bromacil, Dcpa, Disulfoton, Diuron, Hexazinone, Metolachlor, Metribuzin, Picloram, Prometon, Simazine, Tebuthiuron) from being sprayed in vulnerable groundwater areas. Washington also conducts an environmental analysis for proposed pesticide spraying in protected groundwater areas. Oregon's FPA has no such evaluative measures and pesticide restrictions to insure water quality protections; a systematic program of ground water and drinking water quality monitoring in coastal areas is absent as well. For example, North Florence receives its drinking water from Clear Lake, which is supplied entirely by a rare dunal aquifer. The residents getting water from the Heceta Water District and the water district itself have expressed concerns that ground and aerial forestry pesticide sprays taking place directly upslope from Clear Lake is potentially jeopardizing the safety of their drinking water (US EPA, 1987).

- Under the FPA, Oregon agencies, including the Oregon Department of Forestry, have no authority to modify pesticide notification plans and written plans. Oregon should establishing management measures as required by federal law to protect water quality. The EPA should require the Oregon Department of Forestry, in consultation with the Oregon Department of

Environmental Quality, to exercise their authority to review, comment, and require modifications of forest vegetation management written plans based on an environmental and water quality risk assessment and proof of compliance with state and federal laws. Require written plans should be made available for public review and comment. All forest operations, including chemical application documents, should be made available through a publicly accessible website similar to Washington's Forest Practices Application Review System (FPARS). There is no reasonable basis to keeping forestry spray records secret from the public and other state agencies (Beyond Toxics, 2013) [see Section "Agency Oversight and Public Input," pp. 60-62].

- Oregon must develop a research program to determine if aerial application of herbicides is necessary for timber production. Federal agencies determined that aerial pesticide application is too risky for human health and mangages timber production and harvest without the use of aerial spray. Pesticide drift is a long-reported problem in the steep slopes and high wind areas of the Oregon coastal zone. Oregon Health Authority (Oregon Health Authority, 2013) stated drift can travel up to 4 miles from aerial spray applications. The EPA found atrazine particulates and vapors could be transported up to 186 miles from the site of application (US EPA, 2007). This statement suggests it may be impossible for aerial sprays to never affect neighboring residences and streams. With minimal buffers of 60 feet for aerial spray, it is highly likely that pesticides are reaching surface and ground water. Oregon needs additional management measures to protect uses and water quality from pesticide drift, a nonpoint source of pollution.

- Oregon has no program to determine if federal label laws are being complied with. Oregon rules are not aligned with federal regulations for protecting water quality. Some Oregon rules are in conflict with EPA label restrictions and the Clean Water Act. The inconsistencies may contribute to water quality impairment. A study of Oregon's current program of Forestry Notifications and Written Plans under the FPA suggests that federal laws are being disregarded. Oregon's program for overseeing compliance with federal laws is weak because Oregon state agencies have no authority to critique and require modifications of forestry herbicide applications. Furthermore, in Oregon, there is no public process to learn about or make comment on timing, location and types of herbicides used; the Oregon FPA and Right to Farm and Forest laws present unreasonable financial and procedural barriers to public involvement.

Example: When analyzing the Highway 36 Exposure Investigation herbicide spray application records, [redacted] found several spray application records where laws may have been violated. If these violations occurred for spray records in the small sample set from the Siuslaw River area near Triangle Lake, there is a high likelihood these violations are occurring throughout the state. Oregon does not have management measures to determine whether there have been violations and whether enforcement action needs to be taken when it finds out about them.

1. A 2004 court order 300-foot buffer for aerial spraying 2,4-D along Pacific salmon streams may have been violated four times based on spray records obtained as part of the *Hwy 36 Corridor Public Health Assessment Highway 36 Corridor Exposure Investigation*. National Marine Fisheries Service's (NMFS) made findings that Oregon coastal Coho are in jeopardy from exposure to 2,4-D. These possible violations of the 2004 court order point to a significant programmatic deficiency in the Oregon FPA. [redacted]' findings may be the "tip of the iceberg" because our data was limited primarily to the Siuslaw watershed; spraying 2,4-D along salmon streams in other watersheds may be occurring, but the practices is not currently monitored. EPA and NOAA must require the State of Oregon to evaluate past and future spray records to determine if the 2004 court order for 300-foot buffers is being followed. Please see Attachment B.

2. Evidence suggests that federal label restrictions for Atrazine, an Oregon regulated herbicide, are not being followed. Oregon's program of Forestry Notifications and Written Plans under the FPA is inadequate to ensure compliance with federal label requirements and restrictions. Please see Attachment C.

3. Approximately 26% of the spray records did not meet all of the requirements of OAR 629-620-0600. The reason [redacted] raises this issue is because record keeping is directly related to verifiable management measures. Poor record keeping and the agencies' inability to access these records without a formal request from the State Forester underscores Oregon's lack of ability to monitor, measure and protect water quality and beneficial uses. Please see Attachment D.

In summary, Oregon's current laws are antiquated and do not adequately protect the environment and water resources, including all surface water, ground water, drinking water, nor do they protect fish-bearing streams. [redacted]' report on herbicides application records revealed numerous times when the laws may not have been followed, yet there was no agency oversight. Protection of natural resources and oversight of industrial forestry pesticide practices are currently lacking in Oregon.

Oregon has not shown that it has a program to meet all the basic management measures. State-of-the-art and verifiable management measures are needed to meet water quality standards and protect designated uses such as Oregon coastal Coho, other aquatic species and drinking water.

Thank you for the opportunity to provide public comment on CZARA.

[redacted]

[redacted]

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Attachment A

Oregon's Industrial Forests and Herbicide Use:
A Case Study of Risk to People, Drinking Water and Salmon

Executive Summary

Oregon's Industrial Forests and Herbicide Use: A Case Study of Risk to People, Drinking Water and Salmon is the first in-depth analysis of industrial forestry pesticide application records for the State of Oregon. This report provides GIS mapping and quantitative measurements derived from herbicide forestry spray records from Lane County, Oregon to document and discuss three primary concerns:

1) The Oregon Forest Practices Act lacks adequate protections for human health, surface and ground water, and the future survival of protected fish species.
2) Chemical application rules of the Oregon Forest Practices Act fail to fulfill legal responsibilities compared to regulations in the neighboring states of Washington and Idaho, states with similar forest ecosystems.
3) The Oregon Forest Practices Act prohibits other state agencies, researchers, medical professionals and the public from getting accurate information about what types and quantities of herbicides are sprayed. Lack of information increases the potential for health and environmental risks due to the absence of regulations for buffer zones around homes, schools, towns, drinking water, and the headwaters of rivers.

Recommendations

The report concludes with recommendations for modernizing the Oregon Forest Practices Act.

- The State should make the Oregon Forest Practices Act equal to or more effective than the Washington Forest Practices Act.
- Make all forest operations, including chemical application documents, available through a publicly accessible website similar to Washington's Forest Practices Application Review System (FPARS).
- Provide the Oregon Department of Forestry, in consultation with the Oregon Department of Environmental Quality, the authority to review, comment, and require modifications of forest vegetation management written plans based on an environmental and human health assessment and proof of compliance with state and federal laws. Require written plans to be made available for public review and comment.
- Comply with ORS 629-035-0030 subsection 3(B), to protect all surface waters.

Background

The *Case Study of Risk to People, Drinking Water and Salmon* provides information regarding the use of herbicides on 184,320 acres of private industrial and state forestlands surrounding Triangle Lake, a rural area in western Lane County, Oregon.

In 2011, following complaints from rural residents about health problems that coincided with forestry aerial herbicide sprays, state and federal agencies launched the Highway 36 Corridor Public Health Exposure Investigation. The investigation resulted in the Oregon State Forester requiring pesticide applicators to turn over three years of forestry pesticide spray records from private and state timber operations (2009-2011).

Studying the spray records gathered during the Health Exposure Investigation provided new data, and a first-time review and analysis of industrial forestry herbicide practices.

This report raises public awareness and informs policy decisions about the associated risks of a common industrial forestry practice – aerially spraying herbicides over hundreds of thousands of forest and riparian acres.

Findings

- The chemical regulations of the Oregon Forest Practices Act are weaker than regulations in Washington and Idaho. Unlike these neighboring states, in Oregon there are:
    - no spray buffers around homes, schools and farms
    - smaller spray buffers along fish-bearing streams
    - no protections for non-fish surface waters, including headwaters of streams
    - minimal protection of drinking water
    - no protection of ground water, including where ground water filters through to drinking water sources
    - no restrictions of pesticides known to contaminate ground water or prone to drift in air

- Pesticide applicators mix their own “chemical soups,” or tank mixes, of herbicides that contain two to five active ingredients and adjuvant products, despite a lack of understanding about synergistic effects of multiple chemicals combined and released into the environment.

    - The data show increasing acres of aerial sprays applications and increasing pounds of pesticides applied per acre over the three-year period.

- Atrazine and 2,4-D were detected in urine samples of rural residents in 2011, in the same year that:
    - the pounds of 2,4-D applied by aerial spray increased by 80%
    - the pounds of atrazine applied by aerial spray increased by 73%

- Types of herbicides widely used in forestry were detected in threatened coastal Coho salmon habitat streams and in the Triangle Lake School's drinking water.

- Aerial herbicide sprays occur:
    - directly over headwaters of protected salmon streams
    - within 60 feet of threatened Coho salmon streams

Comparing the chemical regulations between Washington and Oregon revealed glaring differences in agency jurisdiction:

- Oregon state agencies have no authority to critique and require modifications of forestry herbicide applications.
- In Oregon, there is no public process to know about or make comment on timing, location and types of herbicides used; there are considerable financial and procedural barriers to public involvement.
- The Oregon Forest Practices Act prohibits doctors, the public or researchers from obtaining timely access to herbicide spray records.

Conclusion

Based on the assessment of herbicide application data, the report concludes the Oregon Forest Practices Act is inadequate to protect human health, drinking water and all surface water. It fails to assure agency oversight, fails to make environmental compliance transparent, and fails to require best management practices based on current science.

Attachment B

Mandated Court-Ordered Buffers for 2,4-D, may have been violated

On January 22, 2004, the United States District Court issued an order establishing pesticide buffer zones. Buffer zones are areas adjacent to certain streams, rivers, lakes estuaries and other water bodies. The court order required a 300-foot buffer for aerial spray and a 60-foot buffer for ground spray along Pacific salmon streams for several pesticides because these chemicals may jeopardize the survival of threatened salmon species (US EPA, 2004). Two of these chemicals were used in the study area, 2,4-D and tryclopyr BEE. The court order was lifted after the National Marine Fisheries Service (NMFS) released a Biological Opinion on June 30, 2011 (NOAA Fisheries, 2013). The U.S. Environmental Protection Agency (EPA) was given a year to implement the restrictions. As of this report, the EPA has not implemented the protections.

Looking specifically at 2,4-D, a chemical identified in the court order, Figure 1 identifies four areas of aerial spray that may have occurred within 300 feet of a salmon and steelhead stream (Spray Application Records 2011-781-00151 units 1, 5, 8 and 9). Three of these sprays were in Fish Creek Watershed, an Oregon Department of Fish and Wildlife-designated Core Cold Water Habitat Stream. Under the court order from 2004 through June 30, 2011, aerial spray containing 2,4-D could not be applied closer than 300 feet from a salmon stream. Figure 2 is the written plan for one of the units. All written plans were similar and did not include the required 300-foot no-spray buffer.

The four aerial sprays in Figure 1 occurred during April 2011 (while the court order was still in effect). The written plans were submitted to the Oregon Department of Forestry as part of the notification. The written plans and spray application records for these units identified the streams as protected resources, but neither of them acknowledged the court-ordered precautions. Thus, it is unclear that the streams received protective measures.

Unit 9 was unique because it was in close proximity to Fish Creek. The creek flows through BLM land. The stream was not identified as a protected area on the spray record because the private timber land boundary is more than 60 feet from the stream channel. Nonetheless it was within the 300-foot buffer required by the court.

Spray records indicate that aerial spray of 2,4-D occurred adjacent to salmon streams during a time when buffers were required. This draws attention to the lack of monitoring, poor enforcement of the law and inability of the Oregon Department of Forestry to evaluate, comment and modify spray notifications and written plans.

Attachment B

Neighboring states affected by the court order took action to enforce the restrictions. For example, the Washington Department of Natural Resources (2009) timber harvest manual clearly informs timber operators of this restriction:

> *A recent federal court ruling has mandated a minimum 300' buffer on some salmon-bearing streams in the State of Washington. This ruling increases buffer size (beyond Forest Practice Rules) on streams when using forest chemicals in certain areas. Check the Washington Department of Agriculture website or call the Department of Agriculture at 1-877-301-4555 to see if you may be affected.*

In Washington state, the spray application would have been reviewed, modified if necessary for approval and possibly undergo an environmental protection assessment.

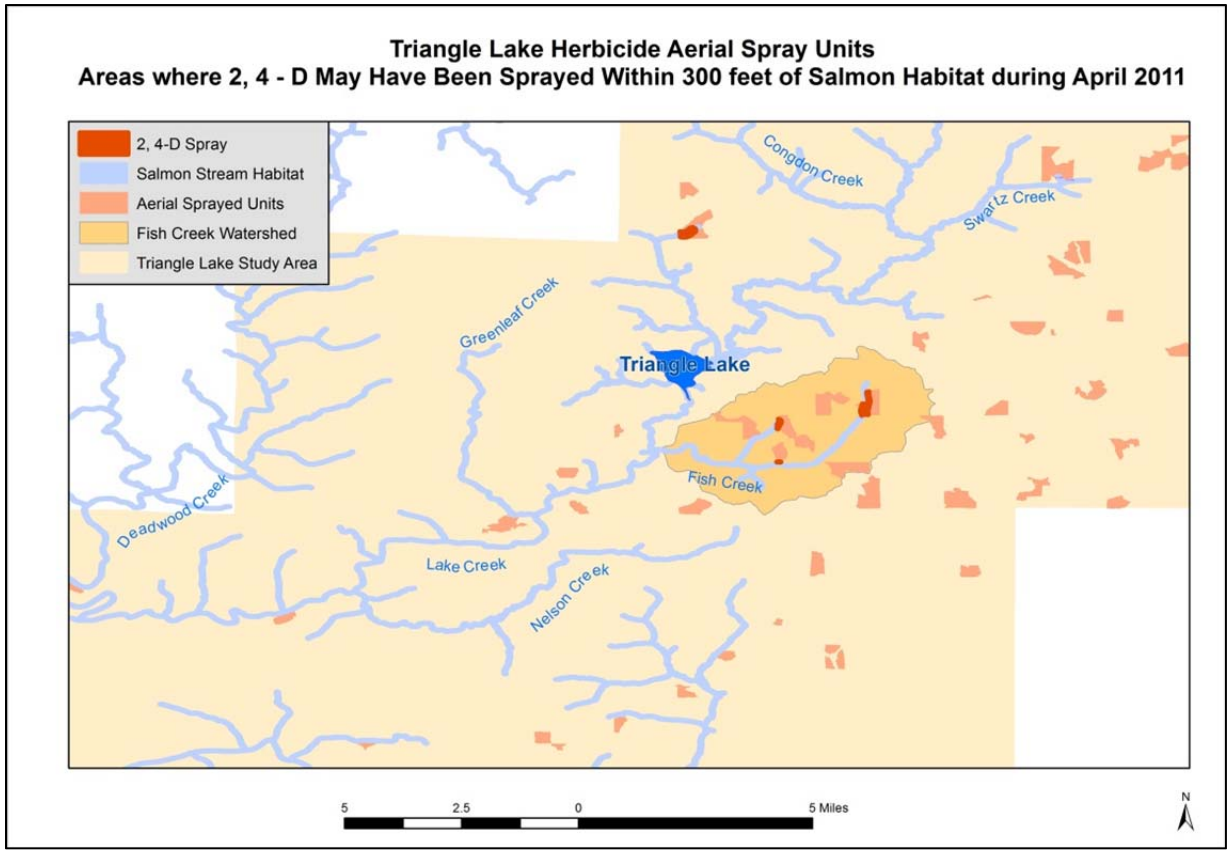

Figure 1. 2,4-D Aerially sprayed close to salmon streams in April, 2011 when the Court ordered buffer zones were in effect.

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Weyerhaeuser
The future is growing™

South Valley Timberlands
P.O. Box 1819
Eugene, OR 97440-1819
541-744-4600 (phone)
541-744-4688 (fax)

WRITTEN PLAN OF OPERATION FOR AERIAL HERBICIDE APPLICATION

Weyerhaeuser Company is planning aerial broadcast spray applications targeting, woody vegetation, broadleaf and/or herbaceous vegetation near protected resources. This letter is our submission of a written plan of operation for activities within 100 feet of protected resources. The attached plat shows the unit boundaries and resources to be protected. Chemical will not be mixed, handled or staged with 100 feet of protected resources.

No herbicide will be directly applied within 60 feet of the high water mark of any protected resource defined as F or D stream, lakes, significant wetlands and other areas of standing open water greater than one-quarter acre at the time of application. No treatment of timbered buffers left during harvest within 100 feet of protected resources will be done. All application will be done in compliance with the Oregon Forest Practices Rules and label instructions. The helicopter pilot will have a current map and/or aerial photo showing locations of the unit boundaries and resources requiring protection. Application of herbicide within the 100 ft adjacent to the protected resources will be flown parallel to the stream.

Unit # Fish 22 # 1328

Legal Description: 16S-7W-Sec22

Stream & Classification Fish Cr Tribs MFSF x3

Sincerely, Date Submitted: 2/22/11

Willie Bronson

Willie Bronson, Forester
South Valley Area

Operator Date

Forest Practices Forester Date

W:\SOVALLEY\0 FORESTRY\AERIALSPRAY\1996-2009 PROJECTS\2009 PROJECTS\WRITTEN PLANS\2009 WRITTENPLAN WILLIE.DOC

Figure 2. Written Plan for application record 2011-781-00151, Unit 5

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Attachment C

Atrazine Sprays May Not Be Meeting Federal Requirements

For some restricted pesticides, the Forest Practices Act (FPA) is more lax than the EPA label requirements. In such situations, the FPA requires the applicator to follow federal pesticide label restrictions. Using multiple sources to determine current regulations can create inconsistency and non-compliance.

A case in point is atrazine, the second most common product (measured in pounds) applied in the Oregon Health Authority Hwy 36 Exposure Investigation study area (Beyond Toxics, 2013). This herbicide is regulated as a restricted product because of concerns about water contamination and toxicity to aquatic species. Legal restrictions are found on federal EPA product labels as well as special announcements on the Oregon Department of Agriculture website. The federal EPA label restrictions for atrazine are significantly different from state regulations. Table 1 highlights these differences (Oregon Department of Agriculture, 2009).

Table 1. Comparison of federal and state atrazine restrictions

Water Bodies	Federal EPA Label Restrictions	Oregon Forest Practices Act Restrictions
Fish streams (Type F)	66’ Aerial Spray	60’ Aerial Spray
	66’ Ground Spray	10’ Ground Spray
Non Fish streams (Type N), with surface water present	66’ Aerial Spray	0’ Aerial Spray
	66’ Ground Spray	0’ Ground Spray
Confluence of flowing streams	66’ Aerial Spray	Not identified
	66’ Ground Spray	Not identified
Points where surface water run-off from adjacent hillsides enters a stream	66’ Aerial Spray	Not identified
	66’ Ground Spray	Not identified
Lakes and reservoirs, estuaries, bogs and wetlands	66’ Aerial Spray	60’ Aerial Spray > 8 acres
	66’ Ground Spray	10’ Ground Spray > 8 acres
Non Fish-bearing streams (Type N), with no surface water present	0’ Aerial Spray	0’ Aerial Spray
	0’ Ground Spray	0’ Ground Spray

Attachment C

The Oregon Forest Practices Act does not require a review of the operator's written plan to determine if it follows federal EPA label requirements. The timber operator submits a notification with a written plan to the Oregon Department of Forestry. Written plans appear to be generic. Operators are not held responsible to adapt the written plan to fit the needs of each location. Consequently, they do not specify compliance with EPA pesticide product labels. For example, there is no indication on the written plans that non-fish streams with surface water present are receiving the required 66 foot no-spray buffer when atrazine or a tank mix containing atrazine is used. Spray application records reviewed for this report did not indicate that pesticide applicators obeyed legal restrictions for atrazine listed in Table 1.

The State Forester may make comments on the written plan, which are advisory only. Department staff is not authorized to approve or make changes to the written plan. In many cases the State Forester's signature is missing from the notification document. The lack of agency oversight prevents assurance that laws and regulations are followed.

The difference between federal and state requirements for atrazine is one example of uncertainty in compliance with regulations that protect water quality. Under the FPA, agency review, operator documentation and monitoring are absent. Aligning FPA requirements with federal requirements would reduce potential violations of the law and help protect Oregon's water quality.

Analysis of the 2009 through 2011 herbicide spray records from the Oregon Health Authority Hwy 36 Exposure Investigation study area (Oregon Health Authority, 2013) found a total of 25 aerial spray application records that included atrazine Figure 3. All units were aerially sprayed during spring months when perennial and intermittent streams are flowing and considered surface waters. The spray application records for these units did indicate resource protection for fish bearing streams. However, the application records did not identify the federal EPA label restrictions for protection of all surface water (Table 1).

To explain the issue Figure 4 displays a subset of six of these application records sprayed with atrazine. Figure 5 is another sub-set of nine of the units sprayed with atrazine within and around the Fish Creek Watershed. The Oregon Department of Fish and Wildlife designated Fish Creek as Core Cold Water Habitat for salmon. Each unit displayed in Figure 3 and Figure 4 were sprayed with a chemical mix of atrazine, 2,4-D and hexazinone.

Figure 6 is examples of an application record while Figure 7 is an example of a written plan. Similar verbiage was used in all other written plans. Fish-bearing streams had a 60-foot no-spray buffer (not the 66-foot requirement) and there were no references to protecting non-fish surface waters.

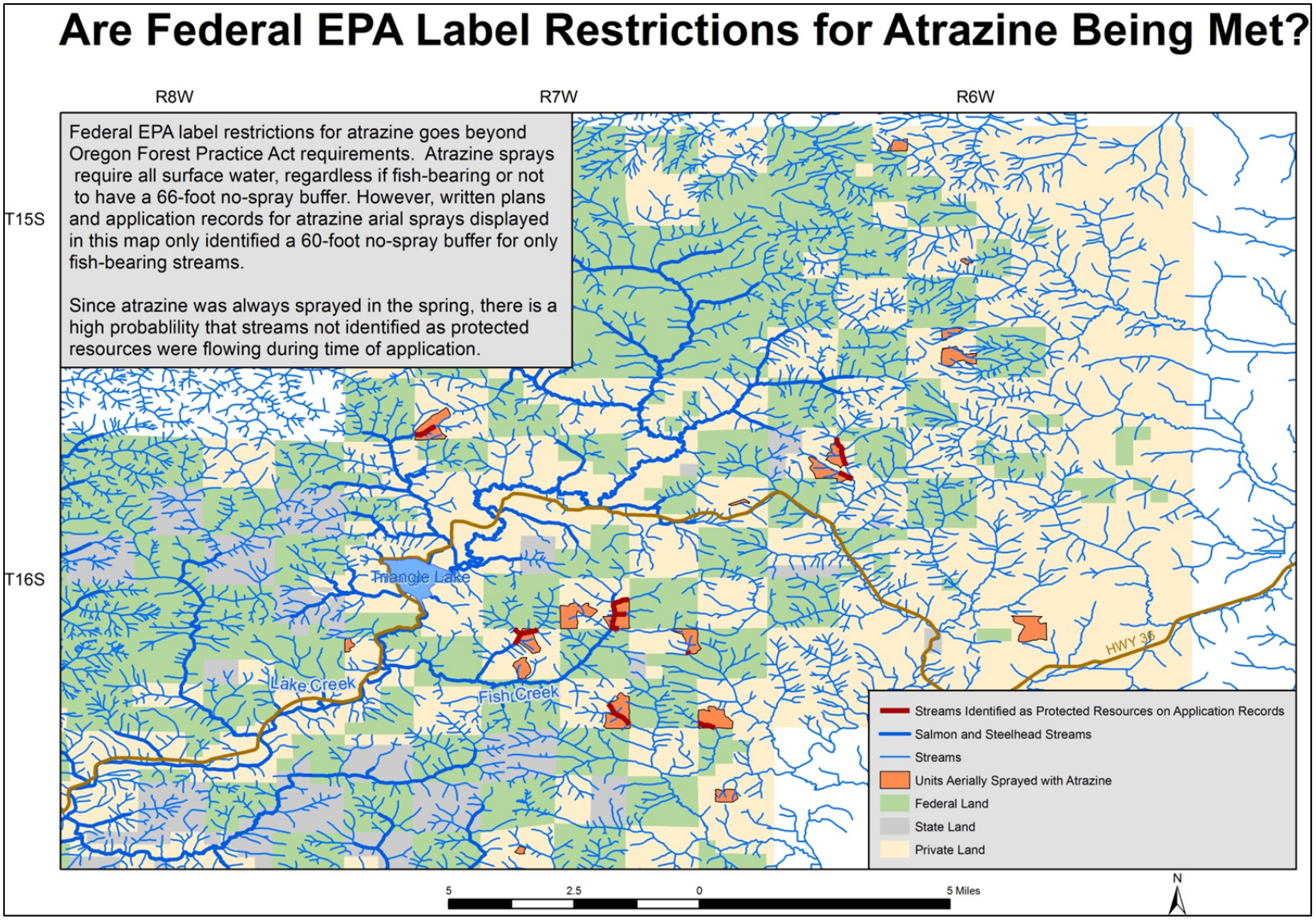


Figure 3. Units Aerially Sprayed with Atrazine

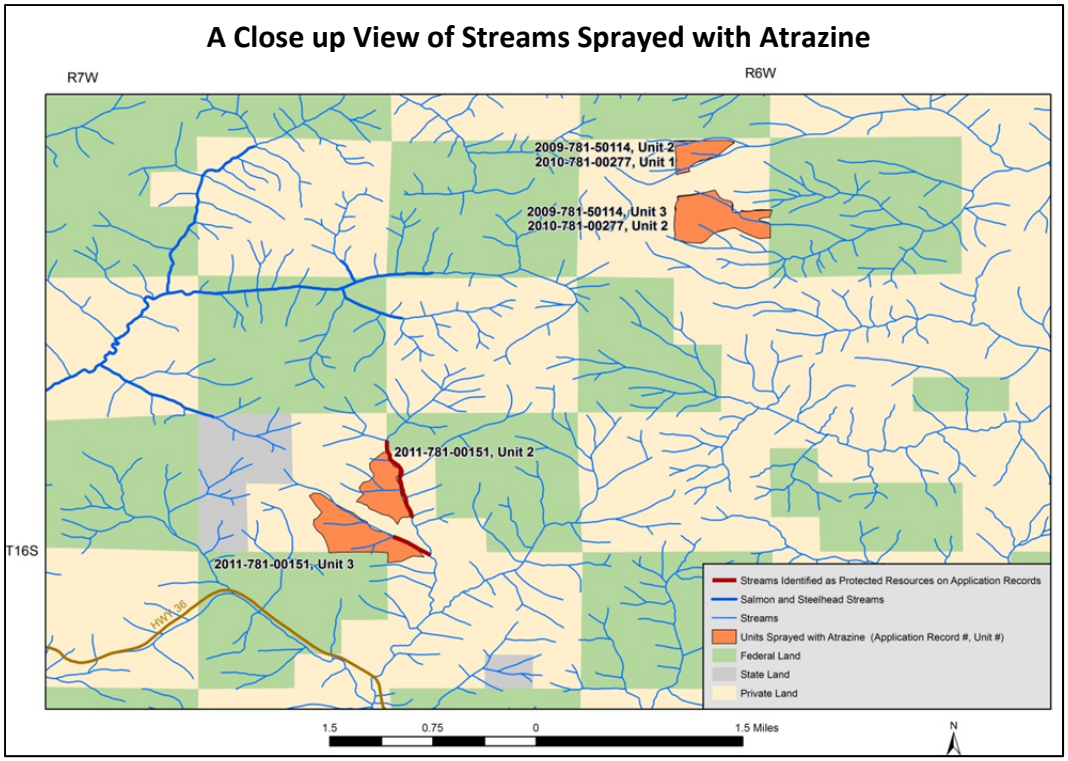


Figure 4. Sub-sample of six units that have been aerially sprayed with atrazine

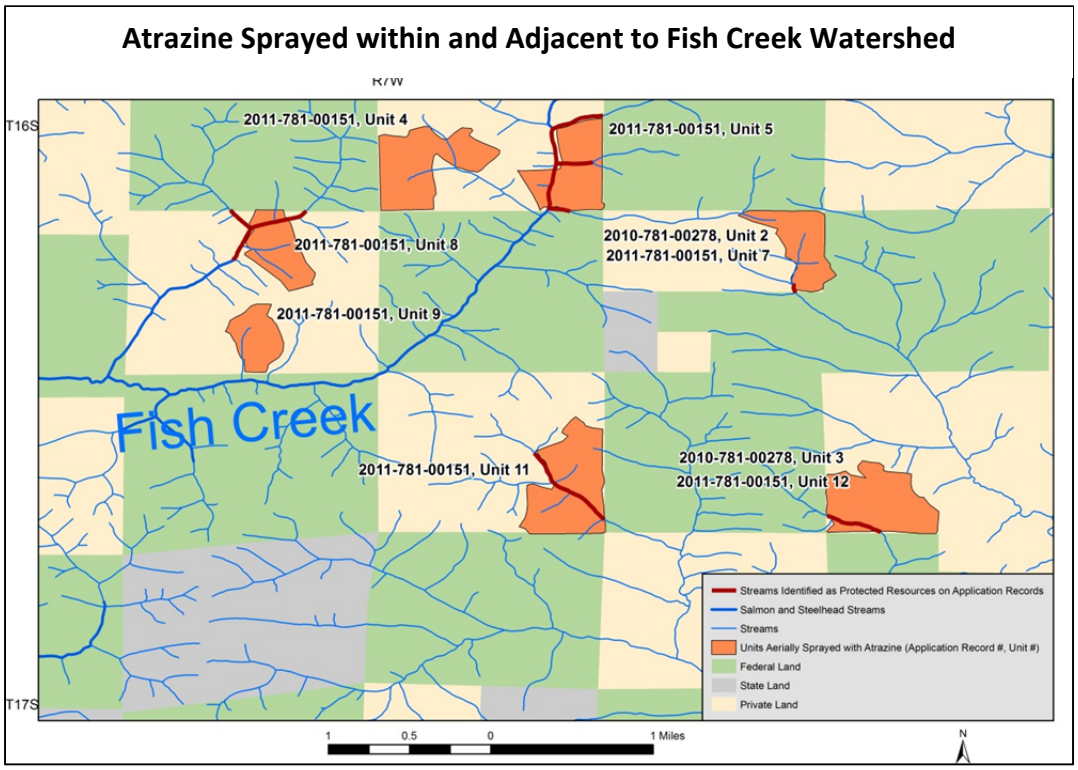


Figure 5. Sub-sample of nine units aerially sprayed with atrazine

Attachment C

Notif: 2011-781-00151
Unit: 3
1322

Weyerhaeuser PROPRIETARY

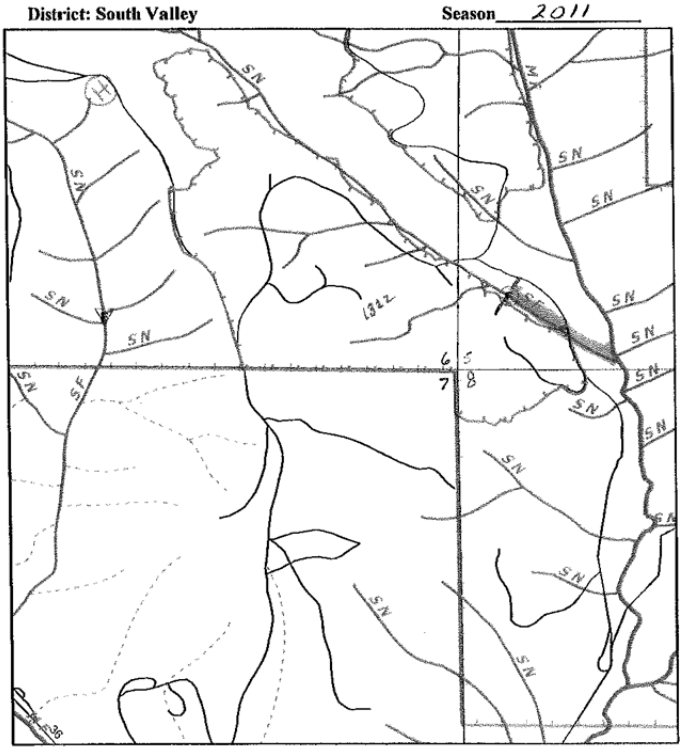
Sattoc HP # 293

Weyerhaeuser Company
South Valley WesternTimberlands
P.O. Box 1819, Eugene, OR 97440
(541) 744-4600 (541) 746-2511 [24 hrs.]

Area/Road No. Lower Dump

Aerial Herbicide Application Report

District: South Valley Season 2011



Sec(s)	6	8	5
Twp(s)	16S	16S	16S
Rge(s)	6W	6W	6W

Elevation: 8-12 Scale 1" = 1,000

Unit(s)	Date(s)	Time of Day (Begin/End)
1322	4/20/11	7:33am / 8:48am
		/
		/

Type of Equipment: Helicopter
Application Method: Broadcast
Contractor/Co.: Weyerhaeuser Company
Full name of applicator/certification #: Wayne Hazard # AG-LU0003194CRA
FAA No.: N108W
Boom Type: Conventional
Nozzle Size: Accuflow 0.025 [illegible]
Pressure: [illegible]

Date	Time	Temp °F/°F	Wind Dir/Spd	RH%
4/20/11	7:30am	39°F/[illegible]	— / 0	[illegible]
4/20/11	8:30am	[illegible]/[illegible]	— / 0	[illegible]

Reforestation Unit #: 11-P114
Chemical Supplier: ✓ Helena ___ Wilbur-Ellis
✓ Containers rinsed at least 3x & recycled
Comments:

Date 4/20/11 By [illegible]

Note: This record shall be kept for 3 years in accordance with ORS 634.146.

Unit	Acres	Chemical/Ac (Trade Name) Chemical 2,4-D Amine	Velpar DF	Surfactant-Carrier/Ac Atrazine 4L	Grounded	[illegible]	Water G/Acre	Total G/Acre	Site Prep	Release	Target Species
1322	82	0.38gal	0.66#	3 Qts.	4/oz	0.1oz	9 G/A	10 G/A		✓	Grass, forbs
Actual	87	32.625gal	57# 7oz	65.25	2gal 92oz	9oz	769gal	870gal			

Written plan required? Yes ☒ No ☐

Resource to be protected: SF Trib To Long Tom River
Submitted to: ODF Veneta Date 2/22/11
Contractor Signed: Date
State Approved Date:

Accord Conc., #62719-324
Arsenal AC, #241-299
Chopper, #241-296
Conifer-90, #34704-689
Escort, #352-439
✓ Other: 2, 4-D Amine 62719-3

Garlon 4, #464-554
Oust XP, #352-601
Transline, #62719-259
✓ Velpar DF, # 352-581
✓ Other: Atrazine 4L 66222-36
Other:

Additional Requirements
☐ Neighbor Notification:
☐ Wetland Protection:
☐ Open Water/Rainfall:
☐ T/E Protection:
☐ Other:

Date State Notification Submitted: 2/22/11

Notes: 15-day waiting period cannot be waived for aerial spray. Full name of all applicators and trainees applying pesticide must be recorded. All information must be recorded within 30 days following the pesticide application.

F:\work\Sovalley\0 Forestry\forms\aerialherbapptemplate2.doc / Revised: June 4, 2004 / Owner: T.Shahed

Figure 6. Application record 2011-781-00151, Unit 3

③
1322

Weyerhaeuser
The future is growing™

South Valley Timberlands
P.O. Box 1819
Eugene, OR 97440-1819
541-744-4600 (phone)
541-744-4688 (fax)

WRITTEN PLAN OF OPERATION FOR AERIAL HERBICIDE APPLICATION

Weyerhaeuser Company is planning aerial broadcast spray applications targeting, woody vegetation, broadleaf and/or herbaceous vegetation near protected resources. This letter is our submission of a written plan of operation for activities within 100 feet of protected resources. The attached plat shows the unit boundaries and resources to be protected. Chemical will not be mixed, handled or staged with 100 feet of protected resources.

No herbicide will be directly applied within 60 feet of the high water mark of any protected resource defined as F or D stream, lakes, significant wetlands and other areas of standing open water greater than one-quarter acre at the time of application. No treatment of timbered buffers left during harvest within 100 feet of protected resources will be done. All application will be done in compliance with the Oregon Forest Practices Rules and label instructions. The helicopter pilot will have a current map and/or aerial photo showing locations of the unit boundaries and resources requiring protection. Application of herbicide within the 100 ft adjacent to the protected resources will be flown parallel to the stream.

Unit # Lower Dump #1322
Legal Description: 16S 6W Sections 5, 6 & 8
Stream & Classification SF

Sincerely, Date Submitted: 2/22/11

Willie Bronson

Willie Bronson, Forester
South Valley Area

Operator Date

Forest Practices Forester Date

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Figure 7. Written plan for aerial spray application record 2011-781-00151, Unit 3

References

Beyond Toxics. (2013). *Oregon's Industrial Forests and Herbicide Use: A Case Study of Risk to People, Drinking Water and Salmon*. Retrieved from Beyond Toxics.org: http://www.beyondtoxics.org/work/pesticide-reform/forestry-pesticide-project/

Oregon Department of Agriculture. (2009). *Atrazine Use in Forest Environment & Atrazine Forest Summary Table*. Retrieved from http://www.oregon.gov/ODA/PEST/pages/registration_index.aspx

Oregon Health Authority. (2013). *Public Health Assessment Highway 36 Corridor Exposure Investigation, Public Comment Release*. Retrieved from http://public.health.oregon.gov/HealthyEnvironments/TrackingAssessment/EnvironmentalHealthAssessment/Hwy36/Pages/Background.aspx

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Pesticide Application Record Problems

A significant number of the pesticide application records obtained as part of the Triangle Lake pesticide exposure investigation (64 out of 245, or approximately 26%) appear not to meet all of the requirements of OAR 629-620-0600, Daily Records of Chemical Applications, which provides as follows:

Oregon Administrative Rule 629-620-0600

Daily Records of Chemical Applications

(1) Whenever pesticides are aerially applied or applied using a pressurized, ground-based, broadcast application system on forestland, the operator shall maintain a daily record of application operations which includes:

(a) The legal description of the location of the operation area actually treated with chemicals;

(b) The acreage actually treated with chemicals;

(c) Brand name or EPA registration number of the chemicals used, the carrier used, and the application rate;

(d) Date and time of application;

(e) Air temperature, to be measured within the operation area and recorded at least hourly for aerial applications and at least at the beginning and end of each day's application for ground applications;

(f) Relative humidity, to be measured within the operation area and recorded at least hourly for aerial applications and at least at the beginning and end of each day's application for ground applications;

(g) Wind velocity and direction, to be measured within the operation area and recorded at least hourly for aerial applications and at least at the beginning and end of each day's application for ground applications;

(h) The name of the person making the application, including the contractor's name and pilot's name when applied aerially, or the contractor's name and/or employee's name for ground application.

(2) Whenever pesticides are applied on forestland using methods other than those described in section(1) of this rule, the operator shall maintain a daily record of all information listed in subsections (a), (b), (c), (d), and (h) of section(1).

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(3) Whenever fertilizers are applied on forestland, the operator shall maintain a record of all information listed in subsections (a), (b), (d), and (h) of section(1) of this rule and shall also record the application rate and the formulation used.

(4) The records required in sections (1), (2) and (3) of this rule shall be maintained by the operator for three years from the date of application and be made available at the request of the State Forester.

The following 64 pesticide application records appear not to comply with the requirements listed above:

2009-781-50188-1: Two separate records. Rate of individual pesticide per acre is not provided. Total quantity of pesticide is not provided (but can calculate using .625 acres times 1.6 gallons per acre = 1 gallon for July 6 and 3.125 times 1.6 gallons per acre = 5 gallons for July 9). Milestone VM label rate is not to exceed 7 ounces per acre per year. Forestry Garlon XRT label rate is up to 4 quarts (1 gallon or 128 fluid ounces) per acre on forestry sites. **Amounts applied appear to greatly exceed label rates, since 1.6 gallons per acre total was apparently used, and maximum is 1 gallon/acre of Forestry Garlon XRT and 0.05 gallons /acre (7 fluid ounces) of Milestone VM, for a total allowed of 1.05 gallons per acre.**

2009-781-50211-1: Rate of individual pesticide per acre is not provided. Total quantity of pesticide is not provided (but can calculate using 1.875 acres times 1.6 gallons per acre = 3 gallons). Milestone VM label rate is not to exceed 7 ounces per acre per year. Forestry Garlon XRT label rate is up to 4 quarts (1 gallon or 128 fluid ounces) per acre on forestry sites. **Amounts applied appear to greatly exceed label rates, since 1.6 gallons per acre total was apparently used, and maximum is 1 gallon/acre of Forestry Garlon XRT and 0.05 gallons /acre (7 fluid ounces) of Milestone VM, for a total allowed of 1.05 gallons per acre.**

2009-551-34384-1: Records two different sprays. Per acre application rate is illegible. Name of carrier is not provided. Rates per acre are stated but not consistent with other numbers in record.

2009-781-0002-RRC: Carrier is not identified. Acreage treated is not identified. Rate and total quantity of Velpar DF are given, so area of 12 acres (36 pounds/3 pounds per acre) can be calculated, but it is not consistent with 60 gallons of mix and rate of 4.23 gallons/acre of mix, which would be 14.18 acres.

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2009-781-0003-RRC: Carrier is not identified. Acreage treated is not provided. Rate and total quantity of Velpar DF are given, so area of 2 acres (3 pounds/1.5 pounds per acre) can be calculated.

2009-781-50096-1: Name of carrier is not provided; rate per acre is not provided.

2009-781-50198-1: Name of contractor is not provided. Type of application is not provided. Weather information is not provided (might not be required depending on type of application).

2009-781-50219-1: Name of carrier is not provided. Weather data is unusually similar for different days. Identifies Garlon XRT as product, but there is no product of this name in US, only in Canada, so assumed it was Forestry Garlon XRT based on percentage of active ingredient.

2009-781-50247-1: First page: There is an inconsistency in the amount of Accord Concentrate applied: on bottom, it shows 128 oz., on side shows 96 ounces. (Assumed 96 because it is consistent with total shown of 160 oz.)

2009-781-50270-1: Quantities of individual chemicals are not provided (but divided total of 160 oz. Into 96 oz. Accord Concentrate and 64 oz. Garlon 4 based on record 2009-781-00247-1, same operator).

2009-781-50272-1: Quantities of individual chemicals are not provided (but divided total of 289 oz. Into 115.6 oz. Accord Concentrate and 173.4 oz. Garlon 3A based on record 2009-781-00247-1, same operator).

2009-781-50273-1: Quantities of individual chemicals are not provided (but divided total of 160 oz. Into 96 oz. Accord Concentrate and 64 oz. Garlon 4 based on record 2009-781-00247-1, same operator).

2009-781-50427-2: Combined records for two different units (although same TRS). Conflicting dates (10-20-2009 and 10-27-2009) on two separate pages, both relating to ground spray on unit 1505.

2009-781-00456-12: Arsenal is listed with Arsenal Applicators Concentrate number. Assumed Arsenal Applicators Concentrate.

2009-781-50509-1: Acreage treated is not provided. Application rate is not provided.

2009-781-50524-1: Record shows Garlon XRT II (not a registered product) with EPA registration number for combined aminopyralid/2,4-D product. Assumed Forestry Garlon XRT.

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2010-781-00630-1: Record shows applications on 7 different days in November and December; each has **identical and highly unlikely** weather data for temperature, winds, relative humidity and wind direction, including starting temperatures of 62 and temperatures of 70 on completion. For last four records, record shows a total quantity but it is not clear how the quantity is divided between two chemicals.

2010-551-000265-1: No application rate or total quantity of pesticide is provided. It is impossible to determine quantity of pesticide or carrier used.

2010-551-00385-1: Document is notification, not application record. No EPA registration number, no date, no time, no weather information, no total quantity of pesticide, no carrier, and no name of applicator are provided.

2010-781-0001-RRC: Acreage treated is not provided (but determined to be 116.36 acres based on total of 5 gallons of Imazapyr divided by rate per acre (5.5 oz). Name of carrier is not provided.

2010-781-0002-RRC: Acreage treated is not provided (but determined to be 3 acres based on total mix (15 gal) divided by rate per acre (5 gal. mix). Name of carrier is not provided.

2010-781-0003-RRC: Acreage treated is not provided. Name of carrier is not provided. Application rate is not provided.

2010-781-0004-RRC: Acreage treated is not provided. Name of carrier is not provided. Application rate is not provided.

2010-781-0005-RRC: Acreage treated is not provided. Application rate is not provided. Quantity of web oil too close to edge – cut off.

2010-781-0006-RRC: Acreage treated is not provided. Name of carrier is not provided. Application rate is not provided.

2010-781-0007-RRC: Acreage treated is not provided. Name of carrier is not provided. Application rate is not provided.

2010-781-0008-RRC: Appears to be duplicate of 2010-781-0007-RRC (except 0007 has hand-made change). Acreage treated is not provided. Name of carrier is not provided. Application rate is not provided.

2010-781-0009-RRC: Acreage treated is not provided. Name of carrier is not provided. Application rate is not provided.

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2010-781-0010-RRC: Appears to be duplicate of 2010-781-0009-RRC (except 0009 has hand-made change). Acreage treated is not provided. Name of carrier is not provided. Application rate is not provided.

2010-781-0011-RRC: Acreage treated is not provided. Name of carrier is not provided. Application rate is not provided.

2010-781-0012-RRC: Acreage treated is not provided. Name of carrier is not provided. Application rate is not provided. Reference on record to Oust, but no amount or rate provided for Oust.

2010-781-0013-RRC: Acreage treated is not provided. Name of carrier is not provided. Application rate is not provided.

2010-781-0014-RRC: Acreage treated is not provided. Name of carrier is not provided. Application rate is not provided.

2010-781-0015-RRC: Acreage treated is not provided. Name of carrier is not provided. Application rate is not provided.

2010-781-00165-1: Legal description (T.R.S.) is not provided. No product name or EPA number.

2010-781-00205-1: Date of application is not provided. Carrier Application rate is not provided.

2010-781-00250-1: Accord shown with Accord Concentrate EPA number. Assumed it was Accord Concentrate.

2010-781-00332-1: Acreage treated is not provided. Name of carrier is not provided. Rate per acre is not provided.

2010-781-00624-1: Two records, one for aerial spray, one for 4 days of ground spray. Ground spray records do not provide acreage treated.

2010-781-00639-11: Not clear if Arsenal applied; shown on top line but not on actual line. Weyerhaeuser form shows Chopper Gen II as EPA 241-296, but that is number for Chopper. Number for Chopper Gen II is 241-430. Assumed it was Chopper Gen II.

2010-781-00714-1: Total quantity of pesticides is not provided; it is impossible to determine amount applied.

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2010-781-00830-1: Legal description (T. R. S.) is not provided. Notice in FACTS shows start date of 10/14/2010; record says application occurred before notice (6/23/10).

2010-781-00830-2: Legal description (T. R. S.) is not provided.

2010-781-00877-1: Application rate of pesticide and carrier (water) are not provided. Quantity of pesticide is not provided. It is impossible to determine quantity.

2011-781-00306-1: Acreage treated is not provided (but FPA notice says 35 acres). Reference on record to "50% Arsnl spot treatment" but quantity of Arsenal is not provided. Record says "Milestone-triclopyr-62719-519" but Milestone contains aminopyralid, not triclopyr (Milestone VM Plus contains aminopyralid and triclopyr), and registration number is for Milestone, not Milestone VM Plus. **Amount of Milestone applied (5 gallons) appears to greatly exceed label limit of 7 fl. oz. per acre per year (35 acres times 7 fl. oz./acre = 245 fl. oz. = 1.91 gallons, but 5 gallons were applied).** End date in FPA notice is 6/30/11, but record indicates applications were made on 7/28/11, 8/11/11, 8/12/11 and 9/22/11.

2011-551-00239-1: Legal description (T. R. S.) is not provided. Same record as 2011-781-00456-1.

2011-781-0002-RRC: Acreage treated is not provided. Can calculate by dividing total used by rate per acre, but inconsistent depending on chemical used (17 to 18.32 acres). Used 17 acres. Record says more info on back, but copy of back not provided.

2011-781-0003-RRC: Acreage treated is not provided. Can calculate by dividing total used by rate per acre.

2011-781-0004-RRC: Acreage treated is not provided. It is impossible to determine from information provided.

2011-781-0024-RRC: Legal description (T.R.S.) is not provided.

2011-781-00137-1: Product listed as Accord with EPA number for Accord Concentrate. Assumed it was Accord Concentrate. Application rate is not provided (but can be calculated).

2011-781-00205-1: Two separate records. Acreage treated is not provided for first record. Acreage estimated as 67 because quantity of mix was 1/3 the quantity of mix on second record, which estimated 200 acres. Application rate is not

provided for second record. Glyphosate listed; EPA number is for GlyStar Plus. (Used GlyStar Plus in spreadsheet.) Oust listed; EPA number is for Oust XP. (Used Oust XP.) It is impossible to determine quantity of Oust XP for either unit. Label for Oust XP does not provide amounts for claimed ¼ % and .75 % application rates for Oust XP on records.

2011-781-00245-4: Acreage treated is not provided. Map shows 17 acres, so assumed 17 acres. Application rate is not provided.

2011-781-00245-11: Acreage treated is not provided. Map shows 88 acres but dividing total quantities of pesticides by rates comes out to 16 acres. Assumed 16 acres.

2011-781-00456-1: Legal description (T.R.S.) is not provided.

2011-781-00507-1: Application rates of pesticides and carrier are not provided. Total quantity of pesticide is not provided. It is impossible to determine the amount applied.

2011-781-00559-1: Record shows Accord Conc with "II" added by hand. There is no product named Accord Conc II. Assumed it was Accord Concentrate.

2011-781-00569-1: Seven separate units. For August 19, 2011 application, no application rate is provided and there is no way to determine rate or quantity of pesticide applied.

2011-781-00572-4: Some of record is obscured. Two columns of chemicals have illegible labels. Assumed column with 22.75 gallons was MSO; assumed column with 2.421 gallons was dye. Not clear what form of Accord was used. Accord XRT handwritten, Accord Concentrate circled on form. Assumed Accord Concentrate. Bottom of form refers to Polaris AC, but Polaris AC not shown as applied.

2011-781-00606-1: Two records supposedly for same unit, but weather information is different on two forms for 2:00 p.m. on 10/28/11. Total area treated is not shown on spray record forms, although 18 acres is shown on one of the two maps. Rate per acre is not provided. Name of carrier is not provided.

2011-781-00571-3: Amount of dye is illegible; probably says 1.5 to 2 gal. Assumed 1.75 gallons.

2011-781-00571-5: Appears to be two separate records for different units combined by mistake. One is for Weyerhaeuser Unit 1507, T 16S, R 7W, S 22. Name Bear Ridge 22; the other is for Weyerhaeuser Unit 1811, T 17S, R 8W, S 9. Name Chicken Cr.

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2011-781-00675-1: Three separate units. Accord XRT is shown with Accord XRT-II EPA registration number. Assumed it was Accord XRT-II.

2011-781-00676-1: Six separate units. Accord XRT is shown with Accord XRT-II EPA registration number. Assumed it was Accord XRT-II.