VI. Pesticides and Toxics—General

Note: NOAA and EPA received a variety of comments related to pesticides. Summaries of the general pesticide comments and the federal agencies' responses are provided here. See Agriculture-Pesticides and Forestry-Pesticides for a full discussion of the comments received related to pesticides.

A. Adequacy of Oregon's Coastal Nonpoint Program to Address Pesticides and Other Toxics

Comment: Several commenters noted that Oregon needs to improve how it addresses nonpoint source pollution caused by toxics, including pesticides, herbicides, and superfund contaminants. Commenters specifically noted they believed there was excessive use of toxic chemicals in agriculture and forestry practices. One commenter was also concerned about superfund contamination impacting shellfish harvests.

Commenters expressed their concerns with the ability of Oregon's existing pesticide management program to protect the quality of water in streams and groundwater as well as protect human health and aquatic species and called for more federal oversight. One commenter supported this statement by citing results from a watershed council herbicide study that found that pesticides used along roadsides, agricultural fields, and forestry operations were all evident in Oregon's waterways. They noted that while applicators may have applied the herbicide correctly, the study demonstrates runoff is still occurring, indicating that the state's rules are ineffective at protecting water quality from herbicide application. Several other commenters provided personal accounts of health impacts due to pesticide exposure.

One commenter cited various studies to demonstrate pesticide impacts to human health and the environment from one commonly used herbicide, glyphosate. For example, a few studies in the late 1990s and early 2000s linked exposure to glyphosate to an increased risk of non-Hodgkin lymphoma. Other health effects from exposure to glyphosate described by the commenter included breast cancer, ADD/ADHD, increased risks of late abortion, endocrine disruption, and possible increased risk of multiple myeloma. According to studies from the late 2000s, glyphosate causes altered immune responses in fish, and Roundup, a commonly used glyphosate product, is lethal to amphibians. Other environmental impacts from glyphosate were also described. The commenter contended that these human health and environmental impacts have been attributed to exposure to levels of glyphosate below the EPA set standards. The commenter also stated that studies show adverse health effects of other formulated glyphosate products.

Several commenters also felt the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), coupled with the state's pesticide rules and its Water Quality Pesticide Management Plan, were insufficient to control polluted runoff from pesticide application to Oregon's coastal waters. Some commenters stated that Oregon needs to improve pesticide application restrictions and protections for all classes of streams. One commenter noted that neighboring states have stricter requirements for pesticide use and application. Another commenter cited the lack of additional ODA rules beyond the EPA pesticide labels, which they state have been demonstrated to be inadequate to protect threatened coho.

A few commenters also stated that not only do they believe Oregon has weak pesticide laws but compliance with the existing rules is poor. One commenter asserted that evidence suggested that federal label restrictions for atrazine are not being followed. Other commenters complained about the

state's poor record keeping of pesticide application and inadequate notice of spraying events would occur near their neighborhoods and homes.

Other commenters disagreed. They believed Oregon has adequate pesticide controls in place which are consistent with CZARA 6217(g) requirements. They state that state rules (OAR 629-620-0400) provide for the protection of waters of the state and other resources during chemical application. In addition, applicators are required to follow the FIFRA label requirements and meet additional state requirements such as for when and during what conditions pesticides can be applied, mixed, stored, loaded, and used The commenter also states that under state rules, applicators need to take into account weather conditions such as temperature, wind, and precipitation to protect non-target forest resources. A commenter also noted that the FIFRA labels have undergone significant changes since 1998 on how pesticides can be applied to forests. In addition, they assert that the EPA-approved Oregon Water Quality Pesticide Management Plan provides additional description of the state's approach to pesticide management.

Source: 2-B, 17-C, 27-C, 28-D, 31-D, 32-A, 35-F, 35-G, 38-A, 38-D, 41-A, 46-H, 46-M, 46-N, 49-H, 50-B, 54-G6, 54-B, 54-D, 54-F, 54-H, 54-I, 54-M, 54-N, 54-O, 54-Q, 54-R, 54-S, 55-P, 57-GG, 57-HH, 57-II, 57-ZZ, 57-II3, 70-B, 70-C, 70-I, 71-R, 71-AH, 71-AI, 71-AJ, 71-AK, 72-A, 77-S, 77-T, 81-B, 83-E, 83-M, 85-C, 85-D, 85-E

Response: NOAA and EPA recognize that many Oregonians are concerned about the use of pesticides and toxics in Oregon and the adverse impacts they have to the environment and public health. After carefully considering all comments received, NOAA and EPA find that Oregon does not have sufficient pesticide management programs in place and that the state needs to do more to strengthen these programs to protect coastal water quality and designated uses, specifically in regard to the aerial application of herbicides. (See rationale for additional management measures for forestry in final decision document for further discussion of the federal agencies' rationale for this finding...and ag section??). NOAA and EPA will continue to work with Oregon within our authorities, to improve its pesticide management efforts to ensure coastal water quality, human health, and designated uses are protected.

While some commenters asserted that Oregon was not adequately enforcing its existing pesticide laws and that current label requirements were not being followed, as NOAA and EPA explained in the agencies' response to general comments about the enforcement of coastal nonpoint program elements, how well a state is enforcing or implementing its existing authorities is not something that CZARA considers for the approvability of a state's coastal nonpoint program. (See Section IV.C, Enforcement)

Finally, regarding the expressed concern over superfund contaminants, CZARA does not speak to superfund contaminates. Rather superfund contaminants are more appropriately addressed through the Comprehensive Environmental Response, Compensation, and Liability Act (the Superfund Act).

B. Pesticides—Adequacy of Overall Pesticide Monitoring Efforts

Comment: Several commenters noted the need for Oregon to strengthen its pesticide monitoring efforts. They stated that Oregon did not have a program in place to determine if federal label requirements are being followed, nor did it monitor widely and regularly for pesticide runoff. One commenter noted that while unknown and unmonitored pesticide uses are a problem, unknown and unmonitored health and environmental risks from pesticides are also a significant problem.

Commenters discussed various monitoring programs that are needed in Oregon, including programs to: monitor pesticide use and impacts; assess whether pesticide management practices are sufficiently reducing pollution and improving water quality; monitor for pesticides in the air, which eventually deposit onto surface waters and soils; monitor for pesticides in coastal watersheds; monitor for pesticides in surface and drinking waters more frequently than every three years such as directly following an aerial spray event; and track whether federal label laws are being complied with. One commenter also noted that the Oregon lab that tests for pesticides does not have the capacity to test for glyphosate, a commonly used herbicide.

Another commenter also stated that most pesticide risk assessments are based on old and incomplete data and endpoint evaluations and that these needed to be updated with more current information for a better understanding of the true impact of pesticides and acceptable exposure limits. In addition there was little to no understanding of effects from "inert" ingredients in pesticides. The commenter believed that there needed to be more testing and disclosure of these inert ingredients.

A few commenters also objected to NOAA and EPA's statement in the proposed decision document commended the state's Water Quality Pesticide Management Plan and new pilot pesticide monitoring study. They did not think these programs should be praised as part of Oregon's Coastal Nonpoint Program. The commenters did not believe the state's claim that pesticide monitoring would support an adaptive approach and demonstrate when additional controls are needed. They stated that Oregon conducted very little pesticide monitoring to drive an adaptive approach and that none of the pilot monitoring sites are located in the coastal zone.

While the above commenters were concerned with the minimal pesticide monitoring that occurred in Oregon was not sufficient to reveal the true impact of pesticides on the environment and humans, a few other commenters stated pesticide monitoring was adequate. They contend that monitoring efforts have shown that current pesticide management practices do not result in detrimental impacts. For example, one commenter described a study by Dent and Robben (2000) on fish-bearing streams which found no pesticide contamination at or above 1 ppb in any of the post-spray water samples analyzed. The study concluded that that the current Forest Practices Act and pesticide rules are effective at protecting water quality along Type F (fish-bearing) and Type D (drinking water) streams. However, another commenter that discussed the same study asserted that the study may have underestimated pesticide levels.

Source: 54-E, 54-F, 54-S, 57-ZZ, 57-CF-B, 77-R

Response: NOAA and EPA acknowledge that some studies have not found pesticides at toxic levels. However, as some commenters note, the federal agencies believe Oregon still needs to improve its pesticide monitoring and tracking efforts. The federal agencies have revised the decision document to recommend some specific actions the state could take to improve its pesticide monitoring and tracking efforts such as [insert a few examples but doesn't need to include all]. In addition, based on the comments received, NOAA and EPA have also revised its discussion of Oregon's Water Quality and Pesticide Management Plan and pilot pesticide monitoring studies to more clearly acknowledge some of the weaknesses of the plan and pilot studies. (See additional management measures for forestry rationale in the final decision document).

A. Impacts of Forestry Pesticide Application on Human Health, Drinking Water, and the Environment

Comment: Many commenters voiced concerns about the short and long-term impacts of pesticide and herbicide use associated with the forest industry in Oregon, especially using aerial spraying as a method of applying these chemicals. These commenters believed that Oregon coastal watersheds are not adequately protected from the use of these chemicals. Adverse impacts to drinking water, human health, salmon, amphibian and crayfish habitat, water quality, and property values, were among the list of concerns commenters raised. One commenter stated amphibians are particularly vulnerable because they have moist, permeable skin and unshelled eggs that are directly exposed to soil and water that could be contaminated with pesticides. Another commenter also discussed how certain chemical properties of herbicides allow them to persist in the environment and to eventually be carried downstream to fish. They stated that pesticides and herbicides, like atrazine, can bind to soil particles and then washed into waterways through surface runoff, sediment erosion, or groundwater transport. One commenter noted that is of particular concern because in Oregon, it is legal to spray herbicides, like atrazine, over dry channels. During wetter months, when the channels fill with water, atrazine, bound to the soil, can be carried downstream and affect fish.

A commenter also stated that not enough is known about the interactions of various pesticides and herbicides chemicals when mixed. They noted that synergistic effects of unknown components of pesticides could inhibit immune responses and pose long-term unknown issues.

Several commenters sited specific studies or personal observations to support their statements. For example, one commenter stated one finding of the report, *Oregon's Industrial Forests and Herbicide Use: A Case Study of Risk to People, Drinking Water and Salmon*, concluded there are known endocrine disrupting chemicals entering Oregon's drinking water sources and fish-bearing streams.

Other commenters described acute health impacts (e.g., headaches, breathing issues, etc.) immediately following spray events and more long-term health issues they contributed to pesticide exposure. One commenter reported that their drinking water system tested positive for glyphosate while another commenter, from the Triangle Lake area, stated that their urine and blood tested positive for 2,4-D and atrazine metabolites. Another commenter also relayed how people in Western Lane County were found to have low (high?) levels of insecticides in their blood. In the Triangle Lake area, a commenter stated that pesticide application records showed that over 20 tons of pesticides were applied in a three-year period. Commenters also reported seeing dead fish in streams after spray events and said that chemicals used in forest practices have been found in local streams.

Source: 2-C, 2-F, 2-G, 2-K, 2-J, 3-A, 3-B, 27-C, 28-C, 30-G, 30-P, 30-Q, 31-D, 35-L, 40-B, 42-F, 42-M, 42-R, 42-T, 46-E, 46-K, 46-O, 46-D, 46-E, 46-G, 48-F, 48-K,53-D, 54-D, 54-G, 54-F, 54-H, 55-M, 57-CF-A, 57-CF-B, 57-CF-D, 58-I, 59-A, 62-B, 62-C, 62-E, 69-B, 69-C, 69-D, 69-E, 69-F, 70-C, 70-D, 70-E, 70-G, 70-H, 70-J, 70-O, 72-B, 75-C, 76-A, 76-C, 76-D, 77-R, 77-S, 77-T, 83-M, 85-D, 85-E

Response: EPA and NOAA recognize that forestry pesticides are being observed in some drinking water and stream samples in coastal Oregon and that many citizens are concerned about adverse the public health and environmental impacts due to pesticide exposure. To better understand pesticide exposure, the Oregon Health Authority and other agencies are leading an Exposure Investigation to evaluate whether aerial application is affecting drinking water, surface water, food, and other resources. Additional research and monitoring is also needed to understand the potential impacts of pesticide use in Oregon. That is why, in the final decision document for Oregon's Coastal Nonpoint Program, NOAA

and EPA have recommended Oregon continue to strengthen and expand its forestry pesticide monitoring efforts, especially within the coastal nonpoint program area. NOAA and EPA encourage Oregon to develop these more robust monitoring protocols in consultation with EPA and NOAA's National Marine Fisheries Service so that sound methodologies are selected to assess potential impacts to water quality and designated uses.

B. Adequacy of Current Forestry Pesticide Management Practices for Protecting Water Quality and Designated Uses

Comment: Many commenters expressed concern that Oregon does not have adequate management practices in place for the application of pesticides by the forest industry to protect water quality and designated uses. They cited specific studies and personal experiences of pesticide exposure to illustrate that current practices were allowing pesticides to impact human health and the environment. (See summery comment VI.A (Impacts of Forestry Pesticide Application) above.)

Commenters asserted that Oregon does not have an effective pesticide management program to protect groundwater and drinking water. Many commenters focused on the inadequate spray buffers for pesticide application. For example, commenters asserted that Oregon's existing spray buffers for the aerial application of pesticides, including the 60 foot no-spray buffer around fish-bearing streams, are ineffective at protecting water quality and designated uses, including drinking water; the 60 foot buffer is too small and non-fish bearing streams are not protected at all. For example, one commenter described that they observed narrow or non-existent buffers along streams that flow into the Siletz River where there are clear cuts to the banks and aerial spraying occurring over the cuts.

Several commenters noted that Oregon's spray buffer requirements, and many other pesticide management practices, were not as protective as neighboring states. Commenters felt Oregon needed larger spray buffers around waterbodies for the aerial application of pesticides and herbicides. One commenter also suggested a pesticide-free buffer was needed around certain land uses, such as schools. Another commenter expressed concern about herbicide spraying was allowed to occur in Lane County despite protection zone language and the Water Districts efforts to prevent application over the Clean Lake watershed (a drinking water watershed). Another commenter also asserted that additional research is needed to determine if aerial spraying of herbicides by the forest industry is a necessary method of application.

Commenters did not feel Oregon's existing spray buffers were large enough to protect against aerial drift, which they asserted was a common occurrence given the microclimates of the Oregon Coast Range. Commenters were concerned that aerial drift of pesticides from the application site could impact nearby organic farms, vineyard owners, natural forest land owners, members of the community, streams, and drinking water sources. One commenter stated that although the Oregon Health Authority acknowledges that aerial drift can carry pesticides two to four miles from the application site, there is no monitoring of pesticide drift after application. Another commenter noted that glyphosate was detected in Jetty Creek, illustrating that legal spray buffers were not protective enough. A commenter suggested that EPA should require ODF, in consultation with DEQ, to exercise authority to review comments and require modifications of the written forest vegetation management plans when needed. A commenter also stated that additional management measures to provide increased protection for both fish and non-fish bearing streams during the aerial application of herbicides.

However, other commenters contended that Oregon's existing forestry pesticide management practices were adequate. They stated that pesticide applications must be licensed and, along with landowners, are already subject to stringent regulations and guidelines under the FPA and FIFRA. One commenter also noted that ODF has developed guidelines to provide further assistance implementing the FPA rules, including Forest Practice Rule Guidance for Chemical and Other Petroleum Products (2009). A few commenters asserted that EPA label requirements under FIFRA were sufficient. A commenter also noted that EPA has not revised the pesticide labels to reflect the restrictions that NOAA National Marine Fisheries Services' biological opinion on the pesticide labels says are necessary to protect ESA-listed salmon.

One commenter stated that water quality monitoring activities for non-fish bearing streams during and after spraying herbicides has shown no detrimental impacts to water quality. For example, one commenter cited a U.S. Geological Survey study (Kelly et. al, 2012) that looked at pesticide use in the Clackamas Basin. The commenter reported the study found that although low levels of pesticides were detected in some drinking water samples the potential threat to human health was negligible. The study also compared pesticide contamination from urban, forestry, and agriculture use and found that the forest land pesticides were rarely detectable in the McKenzie River, even though forest land accounted for the largest land use in the basin. In addition, a commenter also stated that Oregon continues to monitor for over 100 pesticides, which allows the state to identify potential problems with the aerial application of herbicides, if any arise.

Sources: 2-E, 2-I, 3-A, 27-C, 28-B, 30-G, 30-S2, 35-D, 35-E, 35-J, 42-H, 42-Q, 45-B, 46-C, 46-I, 46-D, 49-H, 54-B, 55-N, 56-F, 57-CT-B, 58-F, 62-B, 69-C, 70-C, 70-E, 70-J, 70-K, 70-L, 70-M2, 70-N, 76-C, 77-R

Response: NOAA and EPA recognize there is concern about the adequacy of Oregon's current spray buffers for pesticides and other pesticide management practices. Although a some research, such as Kelly et. al (2012) has shown that current pesticide management practices may not be resulting in adverse impacts to water quality and designated uses, this study was not conducted directly following a spray event so is not able to paint a full picture of pesticide exposure. Ex. 5 - Deliberative

Ex. 5 - Deliberative

Although there is always room for states to continue to improve their pesticide management practices, for the purposes of coastal nonpoint program approval, NOAA and EPA are only concerned with the adequacy of the state's protective measures for Type N (non-fish bearing streams) during the aerial application of herbicides. The final decision document for Oregon's coastal nonpoint program lists several steps the state could take to provide better protection for these non-fish bearing streams.

Although CZARA allows each state to design a coastal nonpoint program that meets their own unique needs and circumstances, NOAA and EPA also encourage Oregon to look to its neighboring states for examples of more protective practices that may also be useful to implement during the aerial application of herbicides along Type N streams. As some commenters stated, Oregon does have smaller spray buffers for the aerial application of herbicides compared to neighboring states and could learn from neighboring states that have similar topography, weather conditions, and sensitive species. For example, For smaller non-fish bearing streams, Washington maintains a 50-foot riparian and spray buffer (WAC-222-38-040). Idaho has riparian and spray buffers for non-fish bearing streams of 100 feet (IAR 20-02-01). California has riparian buffers for non-fish bearing streams (**), which implicitly restrict the aerial application of herbicides near the stream.

.[insert examples from other states or if included in final decision doc, note that it is discussed more fully there so we don't have to repeat ourselves. –*JW inserted examples from rationale*]

C. Inadequate Notification and Transparency by Forestry Industry When Pesticides Are Used

Comment: Several commenters expressed concern about the poor notification procedures and lack of transparency related to the aerial application of pesticides. For example, one commenter described one instance where aerial spraying occurred within their watershed without warning. Commenters stated that the public is not informed of the exact date when spraying will occur; only provided a six-month window of when it would occur is provided. They also asserted that the notification requirements were vague and that pesticide application records were not available to the public. A commenter stated that application records are only available to the State Forester when requested. Another commenter stated that the Oregon Forest Practices Act prohibits researchers, doctors, and the public from obtaining accurate information about the types and quantities of herbicides that are sprayed.

Sources: 40-C, 42-G, 42-J, 42-K, 42-L, 42-P, 42-S, 46-E, 46-L, 48-G, 48-M, 53-D, 54-G7, 70-M, 85-I

Response: When pesticides are being used, it is important for the public to be well informed about when and what types of pesticides will be used near their property. That is why, in the final decision document, NOAA and EPA have recommended that Oregon improve its notification processes and transparency for the aerial application of herbicides and other pesticides.

D. Inadequate Forestry Pesticide Monitoring

Comment: In addition to their general concern about pesticide use by the forest industry and inadequate spray buffers when pesticides are applied, several commenters expressed their concern about the inadequacy of Oregon's water quality monitoring efforts following aerial application of pesticides and herbicides on forestry lands. One commenter stated 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. Commenters gave many examples of how they believe drinking water, human health, and fish and wildlife have been impaired by aerial spraying.

One commenter noted without effective monitoring protocols, the state lacks data to prove aerial application is a problem and that improvements were needed. For example, one commenter stated there was no monitoring of aerial drift even though the Oregon Health Administration said chemicals could drift two to four miles. Another commenter also noted there was little to no coordination between DEQ and ODF on pesticide monitoring. A few commenters also questioned NOAA and EPA's praise of Oregon's Water Quality Pesticide Management Plan. They noted that while the state purportedly uses water monitoring data to develop adaptive management approaches, the state actually undertakes very little pesticide monitoring and that there is no evidence the state collects any data in coastal watersheds.

It was pointed out that while NOAA and EPA found state-level frameworks and actions sufficient for addressing pesticide water quality controls, none of the pilot monitoring programs supporting this finding occur in the coastal zone. A commenter also added that the agencies "improperly assume that, should riparian buffer standards for type N streams and monitoring programs within the coastal zone adhere to existing state laws and programs concerning water quality and pesticides, then Oregon's CNPCP would warrant approval." The commenter contended that existing state and federal laws do not sufficiently address a large portion of pesticide application activities and do not collect necessary

pesticide application and risk data. Referring to Oregon's Water Quality Pesticide Management Plan, which has a component that relies on monitoring data, a commenter noted that the state does little monitoring of pesticides and there is no indication of data being collected in coastal watersheds. A commenter also expressed concern with the lack of timely coordination between DEQ and ODF on pesticide monitoring in a timely manner.

However, other commenters noted that the Board of Forestry specifically requires effectiveness monitoring and evaluation of the chemical rules which lay out how applicators should use pesticides. They state the rules are designed to ensure chemicals do not occur in soil, air, or waters in quantities injurious to water quality or the overall maintenance of terrestrial or aquatic life. A commenter also noted that that state has established pesticides from forest practices as a low priority in the EPA-approved Water Quality Pesticide Management Plan because pesticide monitoring for forestland has shown that pesticide concentrations are below the lowest benchmarks provided by EPA.

Source: 27-B, 27-D, 30-R, 30-S, 42-G, 42-H, 42-N, 42-O, 46-H, 48-H, 49-H, 49-I, 53-D, 53-H, 53-I, 54-E, 54-F, 54-G1, 57-II, 57-II4, 62-C, 62-F, 70-B, 70-F, 70-J, 77-R, 77-T and State Comments

Response: In order to employ an effective adaptive management approach to pesticide use, as Oregon has proposed, it is important for the state to have a robust pesticide monitoring and tracking program in place that includes timely sampling (e.g. right after aerial application) and monitoring sites throughout the coastal nonpoint area. Although some monitoring studies have not found herbicides at harmful levels, other research has (see above responses). Therefore, as discussed more fully in the final decision document, NOAA and EPA believe Oregon would benefit from improved pesticide monitoring, especially expanding its pilot Pesticide Stewardship Program to include several sites within the coastal management area.

VI. Pesticides and Toxics—General

Note: NOAA and EPA received a variety of comments related to pesticides. Summaries of the general pesticide comments and the federal agencies' responses are provided here. See Agriculture-Pesticides and Forestry-Pesticides for a full discussion of the comments received related to pesticides.

A. Adequacy of Oregon's Coastal Nonpoint Program to Address Pesticides and Other Toxics

Comment: Several commenters noted that Oregon needs to improve how it addresses nonpoint source pollution caused by toxics, including pesticides, herbicides, and superfund contaminants. Commenters specifically noted they believed there was excessive use of toxic chemicals in agriculture and forestry practices. One commenter was also concerned about superfund contamination impacting shellfish harvests.

Commenters expressed their concerns with the ability of Oregon's existing pesticide management program to protect the quality of water in streams and groundwater as well as protect human health and aquatic species and called for more federal oversight. One commenter supported this statement by citing results from a watershed council herbicide study that found that pesticides used along roadsides, agricultural fields, and forestry operations were all evident in Oregon's waterways. They noted that while applicators may have applied the herbicide correctly, the study demonstrates runoff is still occurring, indicating that the state's rules are ineffective at protecting water quality from herbicide application. Several other commenters provided personal accounts of health impacts due to pesticide exposure.

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Several commenters also felt the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), coupled with the state's pesticide rules and its Water Quality Pesticide Management Plan, were insufficient to control polluted runoff from pesticide application to Oregon's coastal waters. Some commenters stated that Oregon needs to improve pesticide application restrictions and protections for all classes of streams. One commenter noted that neighboring states have stricter requirements for pesticide use and application. Another commenter cited the lack of additional ODA rules beyond the EPA pesticide labels, which they state have been demonstrated to be inadequate to protect threatened coho.

A few commenters also stated that not only do they believe Oregon has weak pesticide laws but compliance with the existing rules is poor. One commenter asserted that evidence suggested that federal label restrictions for atrazine are not being followed. Other commenters complained about the

state's poor record keeping of pesticide application and inadequate notice of spraying events would occur near their neighborhoods and homes.

Other commenters disagreed. They believed Oregon has adequate pesticide controls in place which are consistent with CZARA 6217(g) requirements. They state that state rules (OAR 629-620-0400) provide for the protection of waters of the state and other resources during chemical application. In addition, applicators are required to follow the FIFRA label requirements and meet additional state requirements such as for when and during what conditions pesticides can be applied, mixed, stored, loaded, and used The commenter also states that under state rules, applicators need to take into account weather conditions such as temperature, wind, and precipitation to protect non-target forest resources. A commenter also noted that the FIFRA labels have undergone significant changes since 1998 on how pesticides can be applied to forests. In addition, they assert that the EPA-approved Oregon Water Quality Pesticide Management Plan provides additional description of the state's approach to pesticide management.

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Response: NOAA and EPA recognize that many Oregonians are concerned about the use of pesticides and toxics in Oregon and the adverse impacts they have to the environment and public health. After carefully considering all comments received, NOAA and EPA find that Oregon does not have sufficient pesticide management programs in place and that the state needs to do more to strengthen these programs to protect coastal water quality and designated uses, specifically in regard to the aerial application of herbicides. (See rationale for additional management measures for forestry in final decision document for further discussion of the federal agencies' rationale for this finding...and ag section??). NOAA and EPA will continue to work with Oregon within our authorities, to improve its pesticide management efforts to ensure coastal water quality, human health, and designated uses are protected.

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While some commenters asserted that Oregon was not adequately enforcing its existing pesticide laws and that current label requirements were not being followed, as NOAA and EPA explained in the agencies' response to general comments about the enforcement of coastal nonpoint program elements, how well a state is enforcing or implementing its existing authorities is not something that CZARA considers for the approvability of a state's coastal nonpoint program. (See Section IV.C, Enforcement)

Finally, regarding the expressed concern over superfund contaminants, CZARA does not speak to superfund contaminates. Rather superfund contaminants are more appropriately addressed through the Comprehensive Environmental Response, Compensation, and Liability Act (the Superfund Act).

B. Pesticides—Adequacy of Overall Pesticide Monitoring Efforts

Comment: Several commenters noted the need for Oregon to strengthen its pesticide monitoring efforts. They stated that Oregon did not have a program in place to determine if federal label requirements are being followed, nor did it monitor widely and regularly for pesticide runoff. One commenter noted that while unknown and unmonitored pesticide uses are a problem, unknown and unmonitored health and environmental risks from pesticides are also a significant problem.

Commenters discussed various monitoring programs that are needed in Oregon, including programs to: monitor pesticide use and impacts; assess whether pesticide management practices are sufficiently reducing pollution and improving water quality; monitor for pesticides in the air, which eventually deposit onto surface waters and soils; monitor for pesticides in coastal watersheds; monitor for pesticides in surface and drinking waters more frequently than every three years such as directly following an aerial spray event; and track whether federal label laws are being complied with. One commenter also noted that the Oregon lab that tests for pesticides does not have the capacity to test for glyphosate, a commonly used herbicide.

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A few commenters also objected to NOAA and EPA's statement in the proposed decision document commended the state's Water Quality Pesticide Management Plan and new pilot pesticide monitoring study. They did not think these programs should be praised as part of Oregon's Coastal Nonpoint Program. The commenters did not believe the state's claim that pesticide monitoring would support an adaptive approach and demonstrate when additional controls are needed. They stated that Oregon conducted very little pesticide monitoring to drive an adaptive approach and that none of the pilot monitoring sites are located in the coastal zone.

While the above commenters were concerned with the minimal pesticide monitoring that occurred in Oregon was not sufficient to reveal the true impact of pesticides on the environment and humans, a few other commenters stated pesticide monitoring was adequate. They contend that monitoring efforts have shown that current pesticide management practices do not result in detrimental impacts. For example, one commenter described a study by Dent and Robben (2000) on fish-bearing streams which found no pesticide contamination at or above 1 ppb in any of the post-spray water samples analyzed. The study concluded that that the current Forest Practices Act and pesticide rules are effective at protecting water quality along Type F (fish-bearing) and Type D (drinking water) streams. However, another commenter that discussed the same study asserted that the study may have underestimated pesticide levels.

Source: 54-E, 54-F, 54-S, 57-ZZ, 57-CF-B, 77-R

Response: NOAA and EPA acknowledge that some studies have not found pesticides at toxic levels. However, as some commenters note, the federal agencies believe Oregon still needs to improve its pesticide monitoring and tracking efforts. The federal agencies have revised the decision document to recommend some specific actions the state could take to improve its pesticide monitoring and tracking efforts such as [insert a few examples but doesn't need to include all]. In addition, based on the comments received, NOAA and EPA have also revised its discussion of Oregon's Water Quality and Pesticide Management Plan and pilot pesticide monitoring studies to more clearly acknowledge some of the weaknesses of the plan and pilot studies. (See additional management measures for forestry rationale in the final decision document).

Ex. 5 - Deliberative

A. Impacts of Forestry Pesticide Application on Human Health, Drinking Water, and the Environment

Comment: Many commenters voiced concerns about the short and long-term impacts of pesticide and herbicide use associated with the forest industry in Oregon, especially using aerial spraying as a method of applying these chemicals. These commenters believed that Oregon coastal watersheds are not adequately protected from the use of these chemicals. Adverse impacts to drinking water, human health, salmon, amphibian and crayfish habitat, water quality, and property values, were among the list of concerns commenters raised. One commenter stated amphibians are particularly vulnerable because they have moist, permeable skin and unshelled eggs that are directly exposed to soil and water that could be contaminated with pesticides. Another commenter also discussed how certain chemical properties of herbicides allow them to persist in the environment and to eventually be carried downstream to fish. They stated that pesticides and herbicides, like atrazine, can bind to soil particles and then washed into waterways through surface runoff, sediment erosion, or groundwater transport. One commenter noted that is of particular concern because in Oregon, it is legal to spray herbicides, like atrazine, over dry channels. During wetter months, when the channels fill with water, atrazine, bound to the soil, can be carried downstream and affect fish.

A commenter also stated that not enough is known about the interactions of various pesticides and herbicides chemicals when mixed. They noted that synergistic effects of unknown components of pesticides could inhibit immune responses and pose long-term unknown issues.

Several commenters sited specific studies or personal observations to support their statements. For example, one commenter stated one finding of the report, *Oregon's Industrial Forests and Herbicide Use: A Case Study of Risk to People, Drinking Water and Salmon*, concluded there are known endocrine disrupting chemicals entering Oregon's drinking water sources and fish-bearing streams.

Other commenters described acute health impacts (e.g., headaches, breathing issues, etc.) immediately following spray events and more long-term health issues they contributed to pesticide exposure. One commenter reported that their drinking water system tested positive for glyphosate while another commenter, from the Triangle Lake area, stated that their urine and blood tested positive for 2,4-D and atrazine metabolites. Another commenter also relayed how people in Western Lane County were found to have low (high?) levels of insecticides in their blood. In the Triangle Lake area, a commenter stated that pesticide application records showed that over 20 tons of pesticides were applied in a three-year period. Commenters also reported seeing dead fish in streams after spray events and said that chemicals used in forest practices have been found in local streams.

Comment [DM5]: Attributed?

Comment [AC6]: Jenny, your summary comment states low but that doesn't seem right. Should it be high?

Source: 2-C, 2-F, 2-G, 2-K, 2-J, 3-A, 3-B, 27-C, 28-C, 30-G, 30-P, 30-Q, 31-D, 35-L, 40-B, 42-F, 42-M, 42-R, 42-T, 46-E, 46-K, 46-O, 46-D, 46-E, 46-G, 48-F, 48-K,53-D, 54-D, 54-G, 54-F, 54-H, 55-M, 57-CF-A, 57-CF-B, 57-CF-D, 58-I, 59-A, 62-B, 62-C, 62-E, 69-B, 69-C, 69-D, 69-E, 69-F, 70-C, 70-D, 70-E, 70-G, 70-H, 70-J, 70-O, 72-B, 75-C, 76-A, 76-C, 76-D, 77-R, 77-S, 77-T, 83-M, 85-D, 85-E

Response: EPA and NOAA recognize that forestry pesticides are being observed in some drinking water and stream samples in coastal Oregon and that many citizens are concerned about adverse the public health and environmental impacts due to pesticide exposure. To better understand pesticide exposure, the Oregon Health Authority and other agencies are leading an Exposure Investigation to evaluate whether aerial application is affecting drinking water, surface water, food, and other resources. Additional research and monitoring is also needed to understand the potential impacts of pesticide use in Oregon. That is why, in the final decision document for Oregon's Coastal Nonpoint Program, NOAA

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and EPA have recommended Oregon continue to strengthen and expand its forestry pesticide monitoring efforts, especially within the coastal nonpoint program area. NOAA and EPA encourage Oregon to develop these more robust monitoring protocols in consultation with EPA and NOAA's National Marine Fisheries Service so that sound methodologies are selected to assess potential impacts to water quality and designated uses.

Comment [AC9]: Revise and expand as appropriate to match final decision rationale language.

B. Adequacy of Current Forestry Pesticide Management Practices for Protecting Water Quality and Designated Uses

Comment: Many commenters expressed concern that Oregon does not have adequate management practices in place for the application of pesticides by the forest industry to protect water quality and designated uses. They cited specific studies and personal experiences of pesticide exposure to illustrate that current practices were allowing pesticides to impact human health and the environment. (See summery comment VI.A (Impacts of Forestry Pesticide Application) above.)

Commenters asserted that Oregon does not have an effective pesticide management program to protect groundwater and drinking water. Many commenters focused on the inadequate spray buffers for pesticide application. For example, commenters asserted that Oregon's existing spray buffers for the aerial application of pesticides, including the 60 foot no-spray buffer around fish-bearing streams, are ineffective at protecting water quality and designated uses, including drinking water; the 60 foot buffer is too small and non-fish bearing streams are not protected at all. For example, one commenter described that they observed narrow or non-existent buffers along streams that flow into the Siletz River where there are clear cuts to the banks and aerial spraying occurring over the cuts.

Several commenters noted that Oregon's spray buffer requirements, and many other pesticide management practices, were not as protective as neighboring states. Commenters felt Oregon needed larger spray buffers around waterbodies for the aerial application of pesticides and herbicides. One commenter also suggested a pesticide-free buffer was needed around certain land uses, such as schools. Another commenter expressed concern about herbicide spraying was allowed to occur in Lane County despite protection zone language and the Water Districts efforts to prevent application over the Clean Lake watershed (a drinking water watershed). Another commenter also asserted that additional research is needed to determine if aerial spraying of herbicides by the forest industry is a necessary method of application.

Commenters did not feel Oregon's existing spray buffers were large enough to protect against aerial drift, which they asserted was a common occurrence given the microclimates of the Oregon Coast Range. Commenters were concerned that aerial drift of pesticides from the application site could impact nearby organic farms, vineyard owners, natural forest land owners, members of the community, streams, and drinking water sources. One commenter stated that although the Oregon Health Authority acknowledges that aerial drift can carry pesticides two to four miles from the application site, there is no monitoring of pesticide drift after application. Another commenter noted that glyphosate was detected in Jetty Creek, illustrating that legal spray buffers were not protective enough. A commenter suggested that EPA should require ODF, in consultation with DEQ, to exercise authority to review comments and require modifications of the written forest vegetation management plans when needed. A commenter also stated that additional management measures to provide increased protection for both fish and non-fish bearing streams during the aerial application of herbicides.

However, other commenters contended that Oregon's existing forestry pesticide management practices were adequate. They stated that pesticide applications must be licensed and, along with landowners, are already subject to stringent regulations and guidelines under the FPA and FIFRA. One commenter also noted that ODF has developed guidelines to provide further assistance implementing the FPA rules, including Forest Practice Rule Guidance for Chemical and Other Petroleum Products (2009). A few commenters asserted that EPA label requirements under FIFRA were sufficient. A commenter also noted that EPA has not revised the pesticide labels to reflect the restrictions that NOAA National Marine Fisheries Services' biological opinion on the pesticide labels says are necessary to protect ESA-listed salmon.

One commenter stated that water quality monitoring activities for non-fish bearing streams during and after spraying herbicides has shown no detrimental impacts to water quality. For example, one commenter cited a U.S. Geological Survey study (Kelly et. al, 2012) that looked at pesticide use in the Clackamas Basin. The commenter reported the study found that although low levels of pesticides were detected in some drinking water samples the potential threat to human health was negligible. The study also compared pesticide contamination from urban, forestry, and agriculture use and found that the forest land pesticides were rarely detectable in the McKenzie River, even though forest land accounted for the largest land use in the basin. In addition, a commenter also stated that Oregon continues to monitor for over 100 pesticides, which allows the state to identify potential problems with the aerial application of herbicides, if any arise.

Sources: 2-E, 2-I, 3-A, 27-C, 28-B, 30-G, 30-S2, 35-D, 35-E, 35-J, 42-H, 42-Q, 45-B, 46-C, 46-I, 46-D, 49-H, 54-B, 55-N, 56-F, 57-CT-B, 58-F, 62-B, 69-C, 70-C, 70-E, 70-J, 70-K, 70-L, 70-M2, 70-N, 76-C, 77-R

Response: NOAA and EPA recognize there is concern about the adequacy of Oregon's current spray buffers for pesticides and other pesticide management practices. Although a some research, such as Kelly et. al (2012) has shown that current pesticide management practices may not be resulting in adverse impacts to water quality and designated uses, this study was not conducted directly following a spray event so is not able to paint a full picture of pesticide exposure. Ex. 5 - Deliberative

Comment [AC10]: Compare with final rationale language and revise accordingly.

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Although there is always room for states to continue to improve their pesticide management practices, for the purposes of coastal nonpoint program approval, NOAA and EPA are only concerned with the adequacy of the state's protective measures for Type N (non-fish bearing streams) during the aerial application of herbicides. The final decision document for Oregon's coastal nonpoint program lists several steps the state could take to provide better protection for these non-fish bearing streams.

Although CZARA allows each state to design a coastal nonpoint program that meets their own unique needs and circumstances, NOAA and EPA also encourage Oregon to look to its neighboring states for examples of more protective practices that may also be useful to implement during the aerial application of herbicides along Type N streams. As some commenters stated, Oregon does have smaller spray buffers for the aerial application of herbicides compared to neighboring states and could learn from neighboring states that have similar topography, weather conditions, and sensitive species. For example, For smaller non-fish bearing streams, Washington maintains a 50-foot riparian and spray buffer (WAC-222-38-040). Idaho has riparian and spray buffers for non-fish bearing streams of 100 feet (IAR 20-02-01). California has riparian buffers for non-fish bearing streams (**), which implicitly restrict the aerial application of herbicides near the stream.

Comment [AC14]: Riparian or spray? – *JW, I think both, but will confirm.*

Comment [AC15]: This is all about drinking water so don't think its relevant here. – *JW- okay*

.[insert examples from other states or if included in final decision doc, note that it is discussed more fully there so we don't have to repeat ourselves. –*JW inserted examples from rationale*]

C. Inadequate Notification and Transparency by Forestry Industry When Pesticides Are Used

Comment: Several commenters expressed concern about the poor notification procedures and lack of transparency related to the aerial application of pesticides. For example, one commenter described one instance where aerial spraying occurred within their watershed without warning. Commenters stated that the public is not informed of the exact date when spraying will occur; only provided a six-month window of when it would occur is provided. They also asserted that the notification requirements were vague and that pesticide application records were not available to the public. A commenter stated that application records are only available to the State Forester when requested. Another commenter stated that the Oregon Forest Practices Act prohibits researchers, doctors, and the public from obtaining accurate information about the types and quantities of herbicides that are sprayed.

Sources: 40-C, 42-G, 42-J, 42-K, 42-L, 42-P, 42-S, 46-E, 46-L, 48-G, 48-M, 53-D, 54-G7, 70-M, 85-I

Response: When pesticides are being used, it is important for the public to be well informed about when and what types of pesticides will be used near their property. That is why, in the final decision document, NOAA and EPA have recommended that Oregon improve its notification processes and transparency for the aerial application of herbicides and other pesticides.

Comment [AC16]: Check with language in final rationale and revise as needed.

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D. Inadequate Forestry Pesticide Monitoring

Comment: In addition to their general concern about pesticide use by the forest industry and inadequate spray buffers when pesticides are applied, several commenters expressed their concern about the inadequacy of Oregon's water quality monitoring efforts following aerial application of pesticides and herbicides on forestry lands. One commenter stated 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. Commenters gave many examples of how they believe drinking water, human health, and fish and wildlife have been impaired by aerial spraying.

One commenter noted without effective monitoring protocols, the state lacks data to prove aerial application is a problem and that improvements were needed. For example, one commenter stated there was no monitoring of aerial drift even though the Oregon Health Administration said chemicals could drift two to four miles. Another commenter also noted there was little to no coordination between DEQ and ODF on pesticide monitoring. A few commenters also questioned NOAA and EPA's praise of Oregon's Water Quality Pesticide Management Plan. They noted that while the state purportedly uses water monitoring data to develop adaptive management approaches, the state actually undertakes very little pesticide monitoring and that there is no evidence the state collects any data in coastal watersheds.

It was pointed out that while NOAA and EPA found state-level frameworks and actions sufficient for addressing pesticide water quality controls, none of the pilot monitoring programs supporting this finding occur in the coastal zone. A commenter also added that the agencies "improperly assume that, should riparian buffer standards for type N streams and monitoring programs within the coastal zone adhere to existing state laws and programs concerning water quality and pesticides, then Oregon's CNPCP would warrant approval." The commenter contended that existing state and federal laws do not sufficiently address a large portion of pesticide application activities and do not collect necessary

pesticide application and risk data. Referring to Oregon's Water Quality Pesticide Management Plan, which has a component that relies on monitoring data, a commenter noted that the state does little monitoring of pesticides and there is no indication of data being collected in coastal watersheds. A commenter also expressed concern with the lack of timely coordination between DEQ and ODF on pesticide monitoring in a timely manner.

However, other commenters noted that the Board of Forestry specifically requires effectiveness monitoring and evaluation of the chemical rules which lay out how applicators should use pesticides. They state the rules are designed to ensure chemicals do not occur in soil, air, or waters in quantities injurious to water quality or the overall maintenance of terrestrial or aquatic life. A commenter also noted that that state has established pesticides from forest practices as a low priority in the EPA-approved Water Quality Pesticide Management Plan because pesticide monitoring for forestland has shown that pesticide concentrations are below the lowest benchmarks provided by EPA.

Source: 27-B, 27-D, 30-R, 30-S, 42-G, 42-H, 42-N, 42-O, 46-H, 48-H, 49-H, 49-I, 53-D, 53-H, 53-I, 54-E, 54-F, 54-G1, 57-II, 57-II4, 62-C, 62-F, 70-B, 70-F, 70-J, 77-R, 77-T and State Comments

Comment [AC18]: Hum. None of the other summary comments have addressed the state comments. May need to add state comments to other sections?

Response: In order to employ an effective adaptive management approach to pesticide use, as Oregon has proposed, it is important for the state to have a robust pesticide monitoring and tracking program in place that includes timely sampling (e.g. right after aerial application) and monitoring sites throughout the coastal nonpoint area. Although some monitoring studies have not found herbicides at harmful levels, other research has (see above responses). Therefore, as discussed more fully in the final decision document, NOAA and EPA believe Oregon would benefit from improved pesticide monitoring, especially expanding its pilot Pesticide Stewardship Program to include several sites within the coastal management area.

Comment [AC19]: Compare to final lang. in decision doc and revise as necessary.

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