

DRAFT

## Rockaway Beach Source Water Protection Plan Risks Prioritization Table (Surface Water)

7/9/2024

Identifying and prioritizing potential risks will form the foundation for developing strategies to protect drinking water quality. Risks can be prioritized based on the likelihood of their occurrence and the severity of their impacts to drinking water sources, water quality, and infrastructure. Using a scale of 1-5, please indicate how you would rate these two aspects for each risk below.

Likelihood		Impact	
1	Rare/very unlikely	1	Insignificant
2	Unlikely	2	Minor
3	Possible	3	Moderate
4	Likely	4	Severe
5	Almost certain	5	Catastrophic

Risks to Jetty Creek Drinking Water Source

Risk Category	Risk	Description and Impacts	Comments/Questions	Input on Risk Likelihood (scale of 1-5)	Input on Risk Impact (scale of 1-5)
Natural Hazards	Highly Erodible Soils	80% of the stream miles (18.58 mi) within 500 feet of the stream in the source water area contain soils with high erosion potential (USWA, 2016). Highly erodible soils contribute sediment and potential contaminants at a higher rate to the water source, increasing turbidity and decreasing water quality. There are steep slopes in the watershed, and significant rain events are expected in the wet season.	<p>Look into sources of data. DEQ can look into providing more data.</p> <p>Most of the risk assessments are based on ~8-year old data. Would the city be able to support a reassessment of current conditions? For example about landslides and soils data from before recent logging. Could potentially get updated maps from DEQ if possible and if Team &amp; Committee find it necessary.</p> <p>High risk. Steep slopes in the watershed, significant rain events expected in wet season (and a history of erosion and sedimentation post harvest)</p> <p>Likely to get continued input of sediments. Should plan for that while working to implement solutions to reduce input.</p> <p>1.5 to 2 inches of rain in 24 hours will move sediment and turn color regardless of cover type and activities. What BMPs does the water district have to address this risk? Forest soil organic matter can significantly reduce erosion. Cable based harvest systems and larger buffers minimize soil disturbance and leave intact organic matter. Forested buffers also can create sediment when trees blow over and uproot near streams. There is a lot of good data on sediment and harvest operations from studies done by the watershed co-op, Hinckle Creek, Alsea, and Trask Watersheds. The biggest factors in increased sedimentation will be geology and rainfall. Harvests under the FPA rules can increase sedimentation but it will be for a short duration and be within the natural variation of the system.</p> <p>The City has a settling pond off-channel – the issue is that sediment builds up in front of fish screen. This impacts operations. Active management is required annually.</p>	<p>3 4 2-3 4 4 4</p> <p style="text-align: center;"><u>4</u></p>	<p>2 3 1-2 3 4 2-3</p> <p style="text-align: center;"><u>4</u></p>

Risk Category	Risk	Description and Impacts	Comments/Questions	Input on Risk Likelihood (scale of 1-5)	Input on Risk Impact (scale of 1-5)
Natural Hazards	Landslides	Landslide deposits (non-rock material) are mapped near the intake and in the mid-watershed (USWA, 2016). Landslides can increase turbidity in the water. A 2015 landslide closed a road, and several small landslides have been observed. There are many steep slopes in the watershed.	<p>Look into sources of data. ODF publishes high landslide hazard location data; we could look into this more. DEQ can look into providing more updated data, but could take a few months.</p> <p>What level of detail do we want our analysis to be for this risk? We can consider evaluating certain parts of the watershed more closely.</p> <p>Are there risks, such as liabilities, associated with landslides and cleanup?</p> <p>This is a high risk, lots of steep slopes in watershed. Currently majority of the watershed was recently harvested, leading to higher current landslide susceptibility.</p> <p>Risk impact could be dependent on location.</p> <p>At a natural intensity and frequency, they can benefit stream systems by adding woody debris. Recent additions to the FPA rules require leaving trees in certain areas of steep slopes so when they slide sometime in the future, wood is added to the stream. In the last 11 years even with the harvest there hasn't been a major landslide in the watershed. Large forested buffers around streams can act as a barrier or at least slow down velocity of slides, reducing the amount of material that reaches the stream. Slides are acute events. Sedimentation from Minor to moderate severity slides can be mitigated by shutting down the intake when high rains are expected.</p> <p>Seems to be a higher risk of shallow landslides but not deep landslides that would be more likely to affect the water supply.</p> <p>Other water systems in the area have had their infrastructure impacted by landslides.</p> <p>Maps of water intake would be helpful, and input from City on infrastructure risk.</p> <p>Several 2015 landslides had large impacts to water system.</p>	<p>3</p> <p>3</p> <p>1</p> <p>4</p> <p>4</p> <p>2</p> <p style="text-align: center;"><u>3</u></p>	<p>2</p> <p>4</p> <p>2-4</p> <p>3</p> <p>4</p> <p>3</p> <p style="text-align: center;"><u>3</u></p>

Risk Category	Risk	Description and Impacts	Comments/Questions	Input on Risk Likelihood (scale of 1-5)	Input on Risk Impact (scale of 1-5)
Natural Hazards	Drought and Low Streamflows	<p>Drought and low streamflows put the City at risk of water supply shortages and decreased drinking water quality. Low streamflows can increase water temperatures, which may introduce toxic algal blooms. Low flows have a higher concentration of contaminants.</p> <p>Climate change is projected to cause more frequent and severe droughts and low streamflows, which increases the impacts of other risks, such as high stream temperatures, sediment, pollution, dissolved oxygen, algae, and bacteria counts.</p>	<p>High risk of drought, younger age stands will reduce water in Jetty Creek during dry seasons.</p> <p>Drought conditions will increase due to climate change as extreme fluctuations continue.</p> <p>Has the city seen a decline in water availability since the harvests? What is the current water draw from Jetty Cr?</p> <p>Lots of uncertainty in the impact. Some aspects dependent on other conditions (sufficient shading may keep temps down)</p> <p>The single most important factor impacting low stream flows is rainfall, and then geology. Low stream flows are exacerbated by the fact that the city uses the most water when it's at its lowest point. As the city grows and tourism increases this will become more of an issue and can only be solved by adding additional water sources or greater storage.</p> <p>There are several studies highlighting the impacts of forest type on stream flows. The topic is complex and depending on geology has mixed results. In general trees and other plants use water by intercepting rain and it evaporating from foliage before it hits the ground, and by transpiration. Typically when forests are harvested there is an increase in available surface water. As trees mature and begin to use more water there can be a decrease in surface water, and eventually a return to the base line. The impacts have been studied in small drainages using management practices that haven't been used in 60 years. For larger drainages individual harvests have less of an impact. About 20% of a drainage needs to be harvested to impact surface water flow. Larger riparian buffers may also reduce any increase in surface water due to recent harvest. Since Jetty Creek has been managed forest for greater than 60 years, maybe longer, the base line for the water system has been managed forest. A harvest would typically increase available surface water for 2-10 years and then return to baseline.</p> <p>City may have historical streamflow data for Jetty Creek, streamflows may have been lower in recent years.</p>	<p>3 5 2-3 4 4 5</p> <p style="text-align: center;"><u>5</u></p>	<p>4 4 3-4 3 4 4</p> <p style="text-align: center;"><u>5</u></p>
Natural Hazards	Climate Change	<p>Climate change exacerbates existing risks to the drinking water source. It is projected to cause more frequent and severe droughts and low streamflows, which increases the impacts of other risks such as high stream temperatures, sediment, pollution, dissolved oxygen, algae, and bacteria counts. Longer, drier summer months reduces streamflows, thereby reducing water supply when demand is highest. Increasing temperatures and droughts also increase the risk of wildfires in the watershed.</p> <p>Climate change is projected to increase winter precipitation in the form of rainfall and decrease snowpack, which can increase erosion and sediment transport to streams. Storms are also likely to increase in severity and frequency, increasing the risk of flooding and sediment transport to streams.</p>	<p>Team decided to incorporate climate into individual hazards, and make it a separate risk to stand out and reiterate the potential impacts.</p> <p>Lots based on predictions. Some uncertainty in what could happen. Impact could be more or less depending on what actually happens.</p> <p>Climate is always changing and is a relatively slow process that we can adapt to.</p> <p>Harmful algal blooms concern?</p> <p>Oregon coast is designated as "disadvantaged" mainly because of climate change (by OHA &amp; federal orgs).</p>	<p>3 5 1 3 4 5</p> <p style="text-align: center;"><u>5</u></p>	<p>3 4 2 3 4</p> <p style="text-align: center;"><i>Depends on the event specifically</i></p> <p style="text-align: center;"><u>5</u></p>

Rockaway Beach Source Water Protection Plan Risks Prioritization Table (Surface Water)

Risk Category	Risk	Description and Impacts	Comments/Questions	Input on Risk Likelihood (scale of 1-5)	Input on Risk Impact (scale of 1-5)
Natural Hazards	Earthquake	The entire Oregon Coast is at risk of a severe Cascadia Subduction Zone earthquake. The effects of an earthquake could include destruction of water system infrastructure, landslides, and potential contamination of drinking water. Tsunamis following an earthquake would intensify these effects and have additional effects.	Uncertainty as to when the “big one” will hit, but likely to come someday. Depends on the location of the earthquake and severity. (Impact level 4 for worst scenario).	3 4 1 4 5 2  <b>3</b>	5 5 5 4 5 4  <b>5</b>
Natural Hazards	Tsunami	Rockaway Beach is at a higher risk of a tsunami than Tillamook County as a whole (NHMP, 2023). The water treatment plant and public works building are exposed to tsunami (CSZ M9.0-med) and have a greater than 50% probability of moderate to complete damage from a CSZ earthquake (NHMP, 2023). A tsunami could destroy vital infrastructure and result in water supply shortages, potential saltwater intrusion, and other contamination of drinking water.	High risk to infrastructure, assuming Treatment plan is within tsunami zone.  Dependent on the earthquake happening first, but anything within the tsunami zone at risk. Dependent on location of earthquake and severity of tsunami. Impact could be lower or higher.	3 3 1 4 5 1-2  <b>3</b>	4 4 5 4 5 5  <b>5</b>
Natural Hazards	Severe Storms	Severe storms increase the likelihood of high stream turbidity and flooding, which puts drinking water quality at risk. The region has experienced impactful severe storms in recent years. December 2015 storms caused significant riverine flooding east of Highway 101. A combination of sand-blocking outlets and high tides meeting large volumes of runoff from the higher ground caused road closures. January 2021 saw coastal flooding events, landslides, and debris flows in the area. Climate change is projected to increase winter precipitation through more severe storms, which can increase erosion and sediment transport to streams.	These are common enough there should be some experience and knowledge on how to prepare and handle. Usually know these are coming and can prepare in advance. Already frequent enough that preparing for an dealing with these should already be occurring.  It's about when it happens, not if.  Storms are part of life on the Coast. The impact to drinking water will manifest as the topics discussed about, Landslides, Erosion.  Impacts transportation infrastructure, etc., but maybe not drinking water intake & source area as much. Could affect power infrastructure which could affect drinking water supply.	4 5 2 3 4 4-5  <b>4</b>	2 3 3 3 4 4  <b>3</b>

Risk Category	Risk	Description and Impacts	Comments/Questions	Input on Risk Likelihood (scale of 1-5)	Input on Risk Impact (scale of 1-5)
Natural Hazards	Wildfire	Wildfires remove vegetation and damage soils, which increases runoff and erosion and decreases soil water infiltration and retention. Firefighting chemicals could potentially impact water quality. Water used for fire suppression could be taken from the water supply. Increasing temperatures and droughts anticipated from climate change could increase the risk of wildfires.	<p>The majority of wildfires on the coast are human-caused (we could distinguish between natural and human-caused fires in DWPP).</p> <p>Concern of PFAS (not typically used for fire suppression). Not required to inform the state when PFAS is used for fires, but 13 occurrences have been reported statewide since 2020.</p> <p>Question about how we know about the 13 PFAS occurrences and request for more information about this.  <i>Answer (from Alyssa): This number came from the DEQ Emergency Response Program –these were voluntary notices to the state when people used PFAS to extinguish fires. PFAS is not really used in the state for fires, but other types of foam.</i></p> <p>Wildfires in recent years were set off by extreme winds. Climate change could influence the causes of wildfires.</p> <p>High risk – fires always a concern in forests, whether human caused or natural.</p> <p>Not usual. Could be an increasing risk. Depends on location, severity, etc.</p> <p>Wildfire is a natural phenomenon and at some point in time there will be a significant fire. Likely in our lifetime fires will be small and low severity. There is a good, well maintained road system in Jetty Creek which will aid in any fire suppression activities and act as fire breaks. Accumulated slash piles from forest harvesting have been burned reducing the fire hazard. There will be little to no fire use associated with forest harvest in the next 18 years. Forest landowners have their own firefighting crews and contractors to aid in suppression of any future fires.</p>	<p>2 3 1 2 3 2-3</p> <p style="text-align: center;"><u>2</u></p>	<p>2 4 1-4 3 4 4</p> <p style="text-align: center;"><u>3</u></p>
Natural Hazards	Volcanic ashfall	Volcanic ashfall from a Cascade volcanic eruption is identified as a low risk to Lincoln County in the NHMP (2023) but could affect Rockaway Beach. The effects of volcanic ash would be significant for water quality and could damage water infrastructure (NHMP, 2023).	<p>Good to include but not necessarily something within the control of this plan/ a DWPP design?</p> <p>Can't control but could have a response plan just in case.</p> <p>I'm not sure if this is even a risk for Jetty Creek.</p>	<p>2 1 1 1 2 1-2</p> <p style="text-align: center;"><u>1</u></p>	<p>2 3 1 2 3 3-4</p> <p style="text-align: center;"><u>3</u></p>

Risk Category	Risk	Description and Impacts	Comments/Questions	Input on Risk Likelihood (scale of 1-5)	Input on Risk Impact (scale of 1-5)
Forestry Activities (See additional notes at end)	Clearcut harvesting	<p>The source watershed is 100% private forested land with two landowners (USWA, 2016). The USWA (2016) identified clearcut harvesting with a rotation of under 35 years as a potential risk in the source water area. The USWA specified clearcuts southeast of the City's intake as a risk. Aerial imagery from 2000 to 2024 shows that nearly the entire drinking water source area has been clearcut within the ~25 year time period.</p> <p>Timber harvesting impacts the ecology and hydrology of watersheds, including the amount of runoff, stream temperatures, sediment transport, soil properties and moisture retention, and stream turbidity (other DWPPs). Factors such as elevation, slope steepness, and direction of slope can influence the impact of timber harvesting. Jetty Creek has a history of erosion and sedimentation post-harvest). Additionally, younger age stands have been shown to reduce water in Jetty Creek during dry seasons.</p>	<p>Should clearcuts be a separate risk from partial harvesting/thinning?</p> <p>Could consider distinguishing between clearcuts near water intakes versus higher in the watershed due to potentially different impacts.</p> <p>Are risks different for longer rotation cycles? Could consider dividing out clearcutting risks by cycle length or other factors.</p> <p>Consider breaking the forestry section into risks/strategies for the lower watershed and upper watershed, based on the different landowners.</p> <p>Should be a distinct risk from thinning and partial harvesting.</p> <p>New PFA Rules will help in the longer term.</p> <p>Not as much thinning on the coast because of the high winds. Consider the size of clearcuts.</p> <p>Next 20 years will have more regrowth in forested land than clearcuts. Experiencing impacts of previous clearcuts even if they're not as likely in next 20 years.</p> <p>Water supply vs. sediment impacts will differ potentially (keep clearcutting as one category with discussion). Late season water supply potentially higher impact. Regrowth decreases streamflows.</p> <p>WTP has to be shut down during storms due to turbidity. Resiliency planning (shutting off WTP) mitigates risk currently. Fish screen also has to be shut down.</p>	<p>2 4 1 3 4 4-5 for clearcutting, 3 for non-clearcutting</p> <p style="text-align: center;"><b><u>4</u></b></p>	<p>2 4 1-2 3 4 4 for clearcutting, 2 for non-clearcutting</p> <p style="text-align: center;"><b><u>3-4</u></b></p> <p>One thought was to align this with the score for erodible soils (4), but some team members thought the risk impact should be a 3.</p>

Risk Category	Risk	Description and Impacts	Comments/Questions	Input on Risk Likelihood (scale of 1-5)	Input on Risk Impact (scale of 1-5)
Forestry Activities	Pesticides (including herbicides)	<p>Pesticides, herbicides, and fertilizers used in forestry may enter waterways and contaminate water quality. DEQ has reported detections of herbicide residue (sulfometuron-methyl) in Rockaway Beach’s untreated drinking water (USWA, 2016).</p> <p>The method and timing of chemical applications influence the level of risk to drinking water. For example, applying on steep slopes in sparsely vegetated areas increases the risk of contaminating the creek. Aerial spraying is potentially a greater risk to water quality than other application methods. (other DWPPs)</p>	<p>Can we get soils tested and get a list of what sprays and chemicals have been used?</p> <p>Discuss herbicides in addition to pesticides and fertilizers in this section.</p> <p>Current landowners have been involved in conversation around adjusting pesticide and herbicide usage.</p> <p>MOU agreement restricts chemical use in the lower watershed. Pesticides and fertilizers are not typically used in the coastal forests. Not doing spraying in lower watershed.</p> <p>Some risk but rules in place to minimize potential. Would likely take an unintentional circumstance to occur.</p> <p>FPA changes: increased notification of pesticide use, buffers.</p> <p>Herbicides are used following harvests (broadcast applications) and on roadsides typically (~3 year interval). 2013 was last aerial application. Differentiate aerial vs roadsides? Roadsides would have a lower impact. City is contacted &amp; shuts off WTP when spraying happens.</p> <p>~12 mi of forest roads in Stimson portion of watershed</p> <p>Depends on distance from intake, if permits are followed, etc.</p> <p>Going to look into EPA testing for PFAS in pesticides.</p>	<p>1 5 1 2 4 2-3</p> <p style="text-align: center;"><u>4</u></p>	<p>1 3 1-2 2 4 4</p> <p style="text-align: center;"><u>2</u></p>
Forestry Activities	Access Roads	<p>Building, maintenance, and usage of roads, particularly wet weather haul, may contribute to erosion and stream turbidity. Updated Oregon Forest Practices Act rules and best management practices can help reduce these impacts.</p>	<p>The access roads connect to other private forestry lands. Would the City be responsible for the maintenance of roads if it acquired land in the watershed?</p> <p>Depending on the easement structure, the roads would likely be ‘user maintained’ meaning those using the road would be responsible for the maintenance. Since the City would own the road, if acquired, they would be responsible for any maintenance not associated with user use.</p> <p>Could be higher impact depending on the circumstance.</p> <p>Updated FPA rules reduces this risk from “Likely” to “Possible”</p> <p>Depends on the location and road design.</p> <p>Roads in upper watershed don’t seem to be down in floodplain. In good condition</p> <p>Forest Road Inventory Assessment part of FPA rules.</p> <p>Will any roads be built? Could that have different impacts? <i>Most infrastructure would be reused. Any new roads would have higher standards per new FPA.</i></p>	<p>2 3 1-2 2 3 4</p> <p style="text-align: center;"><u>2</u></p>	<p>2 2 1-2 2 3 3</p> <p style="text-align: center;"><u>2</u></p>



Rockaway Beach Source Water Protection Plan Risks Prioritization Table (Surface Water)

Risk Category	Risk	Description and Impacts	Comments/Questions	Input on Risk Likelihood (scale of 1-5)	Input on Risk Impact (scale of 1-5)
Forest Activities	Riparian Impacts	Timber harvesting activities could affect soils and vegetation along streams, resulting in increased erosion and stream turbidity. Reduced vegetation could lead to an increase in stream temperatures and potentially an increase in algae growth and bacteria counts. Updated Oregon Forest Practices Act rules increase riparian buffer zones based on stream classifications and add protections for non-fish-bearing streams.	<p>Less likely to be an issue going forward with new rules. Possibly some legacy impacts.</p> <p>Add invasive species- can use large amounts of water.</p> <p>Updated FPA rules reduces this risk from "Likely" to "Possible"</p> <p>It would be helpful to know which of the streams would fall into fish and non-fish bearing and therefore the PFA levels they qualify under.</p>	<p>1 3 1 2 3 3</p> <p style="text-align: center;"><u>2</u></p>	<p>1 3 1 2 3 2</p> <p style="text-align: center;"><u>2</u></p>
Forestry Activities	Borrow Pit	A small, likely inactive (identified as inactive in the 2002 SWA) borrow pit east of the intake used for local logging roads is a potential risk to drinking water. Spills or leaks of waste or chemicals from mining operations could impact water quality (SWA, 2002).	<p>The original SWA (2002) describes the borrow pit as small and inactive.</p> <p>Comment in June 17 SPPDAC meeting that there is an active borrow pit. Is the active borrow pit in the watershed or outside of it? Which pit is active? There are a lot of trucks going up and down access roads that may or may not be in Jetty Creek Watershed.</p> <p>Get information on where the active pit is from the landowners. City can start identifying on future maps where the active borrow pit is (potentially in the DWPP map).</p> <p>Several potential pits visible in aerial imagery and lidar. Better understanding of number, locations and current/potential use is needed.</p> <p>Single source easier to take measurements to reduce potential problems.</p>	<p>1 2 1 2</p> <p><i>Not Enough Information to Characterize</i> 1-2</p> <p style="text-align: center;"><u>1</u></p>	<p>1 2 1 2</p> <p><i>Not Enough Information to Characterize</i> 2</p> <p style="text-align: center;"><u>1</u></p>
Municipal	Infrastructure leakage or failures	Municipal water system infrastructure, such as pipes, valves, storage tanks, and water treatment facility, is vulnerable to leaks and failures due to aging and wear and tear. Aging infrastructure may impact the City's ability to divert, store, and distribute water. Leaks can increase demand for water diversions, which may not be available during droughts.	<p>This issue is being addressed. The City has an active leak detection program in the budget, and is working to replace mainlines (specifically at Nedonna Beach).</p> <p>This is outside the watershed.</p> <p>Should look at any and all ways to increase efficiency</p> <p>In 2010 there was a significant amount of water loss due to leaks. I'm not sure how much there is now. As infrastructure ages leaks will increase.</p>	<p>3 2 3 3 2 3</p> <p style="text-align: center;"><u>3</u></p>	<p>4 2 2-3 3 3 5</p> <p style="text-align: center;"><u>5</u></p>
Municipal	Vandalism	Vandalism or sabotage would include deliberate damage to water pipelines, the water treatment facility, and other components of water infrastructure. Vandalism could impact water quality or quantity. Cybersecurity is another concern for municipalities, as cyber attacks could affect the City's ability to operate its water system.	<p>Cybersecurity seems like a higher risk than deliberate physical damage.</p> <p>Impact could be higher depending on circumstance, such as cyber attack.</p>	<p>1 3 1 2 1 2</p> <p style="text-align: center;"><u>2</u></p>	<p>4 3 1 3 4 1</p> <p style="text-align: center;"><u>4</u></p>
Municipal	Development	New development will add to water demand. Ensuring the City will have an adequate water supply is a growing concern.	<p>Information, such as projections for climate scenarios and development etc, would help with understanding whether the City has sufficient water supply.</p>	<p>4 3 2 3</p>	<p>3 2 2 4</p>

Rockaway Beach Source Water Protection Plan Risks Prioritization Table (Surface Water)

Risk Category	Risk	Description and Impacts	Comments/Questions	Input on Risk Likelihood (scale of 1-5)	Input on Risk Impact (scale of 1-5)
			<p>Need to take steps to plan for additional need. Increase efficiency, look to alternative sources (desalination?)</p> <p>Development will increase water demand. It seems during August and September there is already more demand than can be supplied during dry years. If that increase causes overuse of the wells that have had problems with salinity coliform and organic compound. That could be a risk to the water source.</p> <p>Some potential development planned by City.</p>	<p>3 3-4</p> <p style="text-align: center;"><u>4</u></p>	<p>3 4</p> <p style="text-align: center;"><u>4</u></p>
Municipal	Tourism	Tourism increases water demand substantially in the summer. Ensuring the City will have an adequate water supply to meet summer demand is a growing concern.	<p>Information, such as projections for climate scenarios and development etc, would help with understanding whether the City has sufficient water supply.</p> <p>Usage rates throughout the year would be helpful to see.</p> <p>Probably similar to development. The challenges with water supply peak with peak tourism at the end of summer.</p> <p>Tourism has become more year-round with short-term rentals. Hasn't affected summer supply based on winter storage.</p>	<p>4 4 3 3 3 4</p> <p style="text-align: center;"><u>4</u></p>	<p>3 3 2 4 3 2-3</p> <p style="text-align: center;"><u>4</u></p>
Land Use	Unauthorized camping	Camping is not allowed on the properties within the watershed, but it can be difficult to prevent people from accessing and camping on the land. Camping land uses that pose a risk to the source watershed include improper garbage and/or human/animal waste disposal, potential vehicular pollution, and fires.	<p>We could include these risks under the municipal category, or create a separate category (such as land use).</p> <p>Could be part of a recreational risk section</p> <p>Not likely to happen on large scale but could occur to some degree. Could offer alternate sites that are more controlled.</p> <p>Especially if homeless crisis expands to other areas like observed in places such as Seaside, OR</p>	<p>3 3 1 2 2 2</p> <p style="text-align: center;"><u>2</u></p>	<p>2 2 1 2 3 2</p> <p style="text-align: center;"><u>2</u></p>
	Recreation	Hiking, horseback riding, and possibly other recreational uses in the source water area pose potential risks to drinking water, such as erosion and pollutants from litter and/or animal waste.	Low amount of use limits impacts and risk.	<p>1 3 1 2 3 4</p> <p style="text-align: center;"><u>2</u></p>	<p>1 2 1 2 2 1</p> <p style="text-align: center;"><u>1</u></p>

DRAFT

### General questions and comments

- Time frame? What time frame are we using? Given enough time all these will occur at their most severe intensity.
- It seems there are primary and secondary risks. Most of the forest management activities are secondary that they may exacerbate the primary. Might combine categories?

### Additional Forestry Comments

#### **Clearcut Harvesting**

The explanation in the description/impacts tab describes potential impacts assuming no rules or BMP's are followed. Because of Oregon's FPA rules and BMP's paired watershed studies such as the Trask and Alsea indicate that direct impacts from harvests are short term and not biologically significant.

Jetty Creek would have been 100% Harvested and likely broadcast burned in the 1950's-60s with no riparian buffers. It is possible that more of the old growth was harvested at an earlier interval. 2010's to present harvest began again under FPA rules and significantly better techniques and technologies.

Average age of Clearcut in West Oregon 40-50 years. Jetty Creek harvest age is older, the last stand we harvested was 56.

There will be no harvesting on Stimson ground for at least 18 years within Jetty Creek.

When does a clear-cut become a young-forest? Currently the youngest stand has 6 year old trees in it and is fully occupied by trees and early seral vegetation. (2 year old trees are replanted). The oldest harvest is 22 years old.

I would argue that thinning can have more risks to cause sedimentation than clearcuts. Thinning often requires more roads to reach around leave trees and leave areas. Thinned stands are more susceptible to strong winds and expose soil when they blow over and uproot.

Mentioned low flow impacts of harvesting under low flow/ drought section

#### **Pesticides, Herbicides, and Fertilizers**

An herbicide is a pesticide, it's confusing to list them separately.

There is no operational practice for fertilizing hemlock stands.

Historically herbicides, insecticides, and rodenticides are the only pesticides associated with forest activities. Insecticides are rarely if ever used currently. Rodenticides are associated with control of mountain beavers and are used very little. Herbicides are commonly used in forestry.

In a typical rotation herbicides are used 1-2 times in 40 to 50 years. Herbicides must meet certain criteria by the EPA to be registered for forestry use. They target biological process such as photosynthesis that are unique to plants, thus they are relatively non-toxic to birds and mammals. most of the products commonly used in forestry are in the class 4 relatively nontoxic category. For comparison dawn dish soap would fall in this category, Table salt is a class 3 slightly toxic, Caffeine is Class 2 moderately toxic. (Acute oral exposure)

There are several studies local to the area looking into forestry related herbicide use and drinking water. DEQ did a study around 2013-2014 along the coast, more recently needle branch part of the Alsea watershed, and Stimson hired a 3<sup>rd</sup> party to conduct a study in the Tillamook Watershed. These studies are under the old FPA

rules. The new rules significantly increased protections of water. In these studies herbicides were sometimes detected at extremely low levels, for short durations within 24 hours of application, immediately adjacent to the application site. They were 100 to 1,000 of times below the MCL for chronic exposure. So, in summary nowhere near a level for health concern for a very short period. Several of these were done with aerial applications.

There likely won't be any broadcast herbicide applications on Stimson forestland in Jetty Creek in the next 18 years. There will be a roadside herbicide application on a 3-4 year cycle. During roadside applications roads are surveyed ahead of time and streams/ wet areas are flagged with a 10' to 50' buffer depending on water type. The water district is also notified ahead of time so that they can shut off the intake during the operation.

I am not aware of a water system ever getting a detection of herbicides over a MCL.

### **Access Roads**

The biggest potential for impact from forest harvest activity will be from roads at stream crossings during high rainfall events. A recent paper from the Trask watershed showed detectable increase in sediments from roads beneath stream crossings but, not at a biologically significant level when following FPA rules and best management practices. The new FPA rules increase protections and infrastructure requirements for roads and stream crossings which should reduce impacts further. Jetty creek has some of the best rock there is to maintain roads, and the infrastructure is up to date and in good health. Foresters routinely survey road surfaces and infrastructure during and after harvest to make sure they are functioning properly. Culverts are surveyed during high rainfall events in an effort to locate and remove any blockages due to slides and high stream flows. FPA rules require structures be built to withstand 100 year flood events. Log hauling and truck traffic is halted during high rain fall events. Usually around 1.5" in 24 hours. Cross drains and road surfaces are designed to direct water away from stream systems so that it can filter through the forest floor.

### **Riparian Impacts**

New FPA buffers require 100'-110' either side of fish streams and 50'-75' buffers to non-fish perennial streams. All other streams have protections from equipment activity. The buffer width is to ensure protection of cold water habitat and from sedimentation. Vegetation on the coast grows rapidly, any riparian area exposed to sunlight will be covered in salmonberry/elderberry within 1-2 years. The biggest impact from riparian areas will be trees uprooting during windstorms and exposing soil near the stream system.