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July 16, 2019

Mr. Cliff Strong, Senior Planner
Whatcom County Planning & Development Services
5280 Northwest Drive
Bellingham, Washington 98226

Dear Mr. Strong:

Subject: Comments on the scope of the Shoreline Management Plan Periodic Update 2020.

Sent via email to: cstrong@co.whatcom.wa.us

Thank you for the opportunity to comment on the scope of Whatcom County's Shoreline Management Plan Periodic Update 2020. The Southern resident orcas, or killer whales, are threatened by (1) an inadequate availability of prey, the Chinook salmon, "(2) legacy and new toxic contaminants, and (3) disturbance from noise and vessel traffic."¹ "Recent scientific studies indicate that reduced Chinook salmon runs undermine the potential for the southern resident population to successfully reproduce and recover."² A 2018 analysis by the National Oceanic and Atmospheric Administration and the State of Washington Department of Fish and Wildlife ranked the fall Chinook stocks that originate in the Nooksack River highest in importance as food sources for the southern resident killer whales.³ The Puget Sound Chinook runs are below their recovery goal and getting worse.⁴ The Shoreline Management Plan Periodic Update 2020 is an opportunity to take steps to help recover the southern resident orcas, the Chinook salmon, and the species and habitats on which they depend. Therefore, Futurewise strongly supports the update.

We do have suggestions on the scope of the update identified below. In addition to these recommendations, Futurewise's endorses the recommendations in RE Sources for Sustainable Communities July 3, 2019, letter on the Whatcom County Shoreline Master Program Periodic Update 2020 scope. Those recommendations will help meet the policy of the Shoreline Management Act and the Shoreline Master Program (SMP) Guidelines.

¹ State of Washington Office of the Governor, Executive Order 18-02 Southern Resident Killer Whale Recovery and Task Force p. 1 (March 14, 2018) last accessed on May 13, 2019 at: https://www.governor.wa.gov/sites/default/files/exec_order/eo_18-02_1.pdf.

² *Id.*

³ National Oceanic and Atmospheric Administration and the State of Washington Department of Fish and Wildlife, *Southern Resident Killer Whale Priority Chinook Stocks* p. 6 (June 22, 2018) accessed on July 16, 2019 at: <https://www.documentcloud.org/documents/4615304-SRKW-Priority-Chinook-Stocks.html> and enclosed with this letter.

⁴ Governor's Salmon Recovery Office, *State of Our Salomon in Watersheds 2018* Executive Summary p. 2 accessed on July 19, 2019 at: <https://stateofsalmon.wa.gov/exec-summary/>.

Futurewise works throughout Washington State to support land-use policies that encourage healthy, equitable and opportunity-rich communities, and that protect our most valuable farmlands, forests, and water resources. Futurewise has members and supporters throughout Washington State including the Whatcom County.

We recommend that Whatcom County review and improve its Shoreline Management Program (SMP) to ensure that it is achieving no net loss of ecological functions and to support the recovery of the Chinook salmon and the southern resident orcas.

As you know, recent scientific data show that Puget Sound continues to be under stress. “Marine water quality continues to decline ...”⁵ Ecologically important lands continue to be converted to other uses.⁶ For these and other reasons the Puget Sound Partnership recommends that state and local governments “[m]ake land-use choices that result in no net loss of habitat function, including through identification and funding of creative policy and market based solutions.”⁷

There is evidence the SMP is not achieving no net loss. The Governor’s Salmon Recovery Office documents in the *State of Our Salmon in Watersheds 2018* Executive Summary that “[p]rogress in some sectors, such as hatcheries, harvest, and nearshore restoration, are being offset with challenges in other sectors such as general habitat loss, disease, predation, and invasive species.”⁸ We are not restoring habitat as fast as we are losing it to development regulations that are not achieving no net loss. To prevent continuing losses of habitat, “[w]e need stronger protections, better compliance, and more enforcement of land use regulations to protect shorelines and improve fish passage and water quality” including stronger shoreline master programs.⁹

The *2016 State of Our Watersheds: A Report by the Treaty Tribes in Western Washington* concurs, writing the

regulatory framework must protect the existing habitat from degradation as improvements in habitat quality and quantity are realized through voluntary effort and directed capital enhancement projects. This is not occurring within WRIA 1 as salmon and shellfish habitat quality and quantity continue to decline due to a general lack of a credible compliance enforcement presence within the watershed. Regulatory reform is required as the current framework clearly is not providing adequate protection.¹⁰

⁵ Puget Sound Partnership, *2017 State of the Sound* p. 77 (2017) accessed on July 16, 2019 at: <http://www.psp.wa.gov/sos.php>.

⁶ *Id.* at p. 13.

⁷ *Id.* at p. 2.

⁸ Governor’s Salmon Recovery Office, *State of Our Salmon in Watersheds 2018* Executive Summary p. 2.

⁹ Governor’s Salmon Recovery Office, *State of Our Salmon in Watersheds 2018* Executive Summary p. 8.

¹⁰ *2016 State of Our Watersheds: A Report by the Treaty Tribes in Western Washington* p. 77 last accessed on July 16, 2019 at: <https://nwifc.org/publications/state-of-our-watersheds/>.

An SMP that achieves no net loss of shoreline ecological functions is necessary to comply with the Shoreline Management Act and the Shoreline Master Program Guidelines.¹¹ As the State of Washington Court of Appeals has held, “reasonable and appropriate uses should be allowed on the shorelines only if they will result in no net loss of shoreline ecological functions and systems. See RCW 90.58.020; WAC 173-27-241(3)(j).”¹²

The Shoreline Management Act requires local governments to determine if the SMP is achieving no net loss. RCW 90.58.080(4)(a) provides in full that:

(4)(a) Following the updates required by subsection (2) of this section, local governments shall conduct a review of their master programs at least once every eight years as required by (b) of this subsection. Following the review required by this subsection (4), local governments shall, if necessary, revise their master programs. The purpose of the review is:

(i) To assure that the master program complies with applicable law and guidelines in effect at the time of the review; and

(ii) To assure consistency of the master program with the local government’s comprehensive plan and development regulations adopted under chapter 36.70A RCW, if applicable, and other local requirements.

So, the Shoreline Management Act (SMA) requires consistency “with applicable law and guidelines in effect at the time of the review ...” of the SMP. The SMA, in RCW 90.58.100(1)(e), also requires the use of “all available information regarding hydrology, geography, topography, ecology, economics, and other pertinent data ...”

The Shoreline Master Program Guidelines also require compliance with applicable laws and guidelines for the SMP update. WAC 173-26-090(2)(d)(i) provides in full that:

(i) The purpose and scope of the periodic review as established by the act is:

(A) To assure that the master program complies with applicable law and guidelines in effect at the time of the review; and

(B) To assure consistency of the master program with the local government’s comprehensive plan and development regulations adopted under chapter 36.70A RCW, if applicable, and other local requirements.¹³

¹¹ WAC 173-26-186(8)(b) & (d); WAC 173-27-241(3)(j). Even through the Shoreline Master Program (SMP) Guidelines are called “guidelines,” they are actually binding state agency rules and shoreline master program updates must comply with them. RCW 90.58.030(3)(b) & (c); RCW 90.58.080(1) & (7).

¹² *Olympic Stewardship Found. v. State Envtl. & Land Use Hearings Office through W. Washington Growth Mgmt. Hearings Bd.*, 199 Wn. App. 668, 690, 399 P.3d 562, 572 (2017), *review denied Olympic Stewardship Found. v. State Dep’t of Ecology*, 189 Wn.2d 1040, 409 P.3d 1066 (2018), and *cert. denied Olympic Stewardship Found. v. State of Washington Envtl. & Land Use Hearings Office*, 139 S. Ct. 81, 202 L. Ed. 2d 25 (2018) underlining added.

¹³ Underlining added.

This, of course, includes the no net loss requirement.¹⁴ While WAC 173-26-090(2)(d)(ii) provides that “[t]he review process provides the method for bringing shoreline master programs into compliance with the requirements of the act that have been added or changed since the last review and for responding to changes in guidelines adopted by the department, together with a review for consistency with amended comprehensive plans and regulations,” this provision does not excuse compliance with WAC 173-26-090(2)(d)(i) and cannot override RCW 90.58.080(4)(a) of the Shoreline Management Act. So, while SMPs must be brought into compliance with new laws and new SMP Guidelines, they must also comply with all current provisions of the SMA and the SMP Guidelines including the no net loss requirement. We urge Whatcom County to update the SMP to achieve no net loss.

The stakes are high in our shared goal of recovering Puget Sound and its important fish and wildlife resources including the Chinook salmon and orcas. It is important that we ensure that SMPs are achieving no net loss.

Adopt up-to-date buffers in the Whatcom County SMP update to protect Chinook habitat and other aquatic habitats

The Shoreline Master Program (SMP) Guidelines, in WAC 173-26-221(3)(c), provides in part that “[i]n establishing vegetation conservation regulations, local governments must use available scientific and technical information, as described in WAC 173-26-201 (2)(a). At a minimum, local governments should consult shoreline management assistance materials provided by the department and *Management Recommendations for Washington's Priority Habitats*, prepared by the Washington state department of fish and wildlife where applicable.”

The State of Washington Department of Fish and Wildlife has recently updated the Priority Habitat and Species recommendations for riparian areas. The updated management recommendations document that fish and wildlife depend on protecting riparian vegetation and the functions this vegetation performs such as maintaining a complex food web that supports salmon and maintaining temperature regimes to name just a few of the functions.¹⁵

To maintain riparian functions, the updated *Riparian Ecosystems, Volume 1: Science synthesis and management implications* scientific report recommends protecting the riparian ecosystem which has a width estimated to be “one Site-Potential Tree Height (SPTH) measured from the edge of the channel, channel migration zone or active floodplain; it also includes wetlands and steep slopes associated with this area. Protecting functions within at least one SPTH is a scientifically supported

¹⁴ WAC 173-26-186(8)(b) & (d); WAC 173-27-241(3)(j).

¹⁵ Timothy Quinn, George Wilhere and Kirk Krueger, (Managing Editors), *Riparian Ecosystems, Volume 1: Science synthesis and management implications* pp. 33 – 36 (A Priority Habitat and Species Document of the Washington Department of Fish and Wildlife, Olympia, WA: Final Version May 2018 [unformatted]) last accessed on Nov. 28, 2018 at: <https://wdfw.wa.gov/publications/01987/> and enclosed in a separate email with the filename: “wdfw01987 for emailing.pdf.”

approach if the goal is to protect and maintain high function of the riparian ecosystem.”¹⁶ The report defines site-potential tree height (SPTH) as the “average maximum height of the tallest dominant trees (200 years or more) for a given site class.”¹⁷ For Whatcom County, the stream length-weighted third quartile 200-year SPTH is 204 feet.¹⁸

We recommend that shoreline jurisdiction be expanded to include the 100-year flood plain¹⁹ and that the buffers for river and stream shoreline be increased to use the newly recommended 200-year SPTH of 204 feet and that this width should be measured from the edge of the channel, channel migration zone, or active floodplain whichever is wider.²⁰ This will help maintain shoreline functions and Chinook habitat.

Protect people, property, and habitat from sea level rise and increased coastal erosion

The Shoreline Management Act and Shoreline Master Program Guidelines require shoreline master programs to address the flooding that will be caused by sea level rise. RCW 90.58.100(2)(h) requires that shoreline master programs “shall include” “[a]n element that gives consideration to the statewide interest in the prevention and minimization of flood damages ...” WAC 173-26-221(3)(b) provides in part that “[o]ver the long term, the most effective means of flood hazard reduction is to prevent or remove development in flood-prone areas ...” The areas subject to sea level rise are flood prone areas just the same as areas along bays, rivers, or streams that are within the 100-year flood plain.

Sea level rise is a real problem that is happening now. Sea level is rising and floods and erosion are increasing. In 2012 the National Research Council concluded that global sea level had risen by about seven inches in the 20th Century.²¹ The new report *Projected Sea Level Rise for Washington State – A 2018 Assessment* projects that for a low greenhouse gas emission scenario there is a 50 percent probability that sea level rise will reach or exceed 1.5 feet by 2100 for the area northwest of Bellingham.²²

¹⁶ Timothy Quinn, George Wilhere and Kirk Krueger, (Managing Editors), *Riparian Ecosystems, Volume 1: Science synthesis and management implications* p. 250 (A Priority Habitat and Species Document of the Washington Department of Fish and Wildlife, Olympia, WA: Final Version May 2018 [unformatted]).

¹⁷ *Id.* at p. xv.

¹⁸ Amy Windrope, Timothy Quinn, Keith Folkerts, and Terra Rentz, *Riparian Ecosystems, Volume 2: Management Recommendations* p. A2-18 (A Priority Habitat and Species Document of the Washington Department of Fish and Wildlife, Olympia: May 2018 Public Review Draft) last accessed on July 16, 2019 at:

<https://wdfw.wa.gov/publications/01988/> and cited pages enclosed in a separate email with the filename: “Pages from wdfw01988 Whatcom.pdf.”

¹⁹ Authorized by RCW 90.58.030(2)(d)(i).

²⁰ Amy Windrope, Timothy Quinn, Keith Folkerts, and Terra Rentz, *Riparian Ecosystems, Volume 2: Management Recommendations* p. A2-18 (A Priority Habitat and Species Document of the Washington Department of Fish and Wildlife, Olympia: May 2018 Public Review Draft).

²¹ National Research Council, *Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future* p. 23, p. 156, p. 96, p. 102 (2012) accessed on Feb. 19, 2019 at: <https://www.nap.edu/download/13389>.

²² *Relative Sea Level Projections for RCP 4.5 for the Coastal Area Near: 48.8N, 122.5W* accessed on July 16, 2019 at: <http://www.wacoastalnetwork.com/wcrp-documents.html> and enclosed with this letter. The methodology used for these projections is available in Miller, I.M., Morgan, H., Mauger, G., Newton, T., Weldon, R., Schmidt, D., Welch, M., Grossman, E., *Projected Sea Level Rise for Washington State – A 2018 Assessment* (A collaboration of Washington Sea Grant,

Projected Sea Level Rise for Washington State – A 2018 Assessment projects that for a higher emission scenario there is a 50 percent probability that sea level rise will reach or exceed 1.9 feet by 2100 for the area northwest of Bellingham.²³ Projections are available for all of the marine shorelines in Washington State. The general extent of the projected sea level rise currently projected for coastal waters can be seen on the NOAA Office for Coastal Management Digitalcoast Sea Level Rise Viewer available at: <https://coast.noaa.gov/digitalcoast/tools/slr.html>

Projected sea level rise will substantially increase flooding. As Ecology writes, “[s]ea level rise and storm surge[s] will increase the frequency and severity of flooding, erosion, and seawater intrusion—thus increasing risks to vulnerable communities, infrastructure, and coastal ecosystems.”²⁴ Not only our marine shorelines will be impacted, as Ecology writes “[m]ore frequent extreme storms are likely to cause river and coastal flooding, leading to increased injuries and loss of life.”²⁵

A peer-reviewed scientific study ranked Washington State 14th in terms of the number of people living on land less than one meter above local Mean High Water compared to the 23 contiguous coastal states and the District of Columbia.²⁶ This amounted to an estimated minimum of 18,269 people in 2010.²⁷ Zillow recently estimated that 31,235 homes in Washington State may be underwater by 2100, 1.32 percent of the state’s total housing stock. The value of the submerged homes is an estimated \$13.7 billion.²⁸ Zillow wrote:

It’s important to note that 2100 is a long way off, and it’s certainly possible that communities [may] take steps to mitigate these risks. Then again, given the enduring popularity of living near the sea despite its many dangers and drawbacks, it may be that even more homes will be located closer to the water in a century’s time, and these estimates could turn out to be very conservative. Either way, left unchecked, it is clear the threats posed by climate change and rising sea levels have the potential to destroy housing values on an enormous scale.²⁹

Sea level rise will have an impact beyond rising seas, floods, and storm surges. The National Research Council wrote that:

University of Washington Climate Impacts Group, Oregon State University, University of Washington, and US Geological Survey. Prepared for the Washington Coastal Resilience Project: 2018) available at the prior webpage.

²³ *Relative Sea Level Projections for RCP 8.5 for the Coastal Area Near: 48.8N, 122.5W* accessed on July 16, 2019 at: <http://www.wacoastalnetwork.com/wcrp-documents.html> and enclosed with this letter.

²⁴ State of Washington Department of Ecology, *Preparing for a Changing Climate Washington State’s Integrated Climate Response Strategy* p. 90 (Publication No. 12-01-004: April 2012) accessed on Feb. 19, 2019 at: <https://fortress.wa.gov/ecy/publications/summarypages/1201004.html>.

²⁵ *Id.* at p. 17.

²⁶ Benjamin H. Strauss, Remik Ziemiński, Jeremy L. Weiss, and Jonathan T. Overpeck, *Tidally adjusted estimates of topographic vulnerability to sea level rise and flooding for the contiguous United States* 7 ENVIRON. RES. LETT. 014033, 4 (2012) accessed on Sept. 26, 2018 at: <http://iopscience.iop.org/1748-9326/7/1/014033/article> This journal is peer reviewed. Environmental Research Letters “Submission requirements” webpage accessed on Sept. 26, 2018 at: <http://iopscience.iop.org/1748-9326/page/Submission%20requirements>.

²⁷ *Id.*

²⁸ Krishna Rao, *Climate Change and Housing: Will a Rising Tide Sink all Homes?* ZILLOW webpage (8/2/2016) last accessed on Feb. 19, 2019 at: <http://www.zillow.com/research/climate-change-underwater-homes-12890/>.

²⁹ *Id.*

Rising sea levels and increasing wave heights will exacerbate coastal erosion and shoreline retreat in all geomorphic environments along the west coast. Projections of future cliff and bluff retreat are limited by sparse data in Oregon and Washington and by a high degree of geomorphic variability along the coast. Projections using only historic rates of cliff erosion predict 10–30 meters [33 to 98 feet] or more of retreat along the west coast by 2100. An increase in the rate of sea-level rise combined with larger waves could significantly increase these rates. Future retreat of beaches will depend on the rate of sea-level rise and, to a lesser extent, the amount of sediment input and loss.³⁰

A recent paper estimated that “[a]nalysis with a simple bluff erosion model suggests that predicted rates of sea-level rise have the potential to increase bluff erosion rates by up to 0.1 m/yr [meter a year] by the year 2050.”³¹ This translates to four additional inches of bluff erosion a year.

A recent peer-reviewed article estimated that up to 8,017 people in Thurston County will be at risk of adverse impacts from sea level rise in 2100.³² The time to adopt protective measures is now.

Homes built today are likely to be in use 2100. And new lots created today will be in use in 2100. This is why the Washington State Department of Ecology recommends “[l]imiting new development in highly vulnerable areas.”³³

Therefore, we recommend that the SMP update require that new lots and new buildings be located outside the area of likely sea level rise and if that is not possible, buildings should be elevated above the likely sea level rise. We recommend the following new regulations be added to the SMP update.

8. New lots shall be designed and located so that the buildable area is outside the area likely to be inundated by sea level rise in 2100 and outside of the area in which wetlands will likely migrate during that time.
9. Where lots are large enough, new structures and buildings shall be located so that they are outside the area likely to be inundated by sea level rise in 2100 and outside of the area in which wetlands and aquatic vegetation will likely migrate during that time.

³⁰ National Research Council, *Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future* p. 135 (2012).

³¹ George M. Kaminsky, Heather M. Baron, Amanda Hacking, Diana McCandless, David S. Parks, *Mapping and Monitoring Bluff Erosion with Boat-based LIDAR and the Development of a Sediment Budget and Erosion Model for the Elwha and Dungeness Littoral Cells, Clallam County, Washington* p. 3 last accessed on Feb. 19, 2019 at: http://www.coastalwatershedinstitute.org/Final%20Report_Clallam%20County%20Bluffs%202014_Final%20revised.pdf.

³² Mathew E. Hauer, Jason M. Evans, and Deepak R. Mishra, *Millions projected to be at risk from sea-level rise in the continental United States* NATURE CLIMATE CHANGE Letters Advance Online Publication p. 3 (Published Online: 14 March 2016 | DOI: 10.1038/NCLIMATE2961). Nature Climate Change is a peer-reviewed science journal. See the Author Instructions accessed on Nov. 26, 2018 at: http://mts-nclim.nature.com/cgi-bin/main.plex?form_type=display_auth_instructions.

³³ State of Washington Department of Ecology, *Preparing for a Changing Climate Washington State’s Integrated Climate Response Strategy* p. 90 (Publication No. 12-01-004: April 2012).

10. New and substantially improved structures shall be elevated above the likely sea level rise elevation in 2100 or for the life of the building, whichever is less.

Section 23.90.07.B should require site investigations for sites that the Washington State Department of Archeology and Historic Preservation predictive model rates as “survey recommended: moderate risk,” “survey highly advised: high risk,” and “survey highly advised: very high risk”

Many historical and cultural sites are in shoreline jurisdiction due to the availability of water, food, and transportation routes. Addressing archaeological resources upfront before projects begin can save money. For example, the Jefferson County Public Utility District’s (PUD) contractor building a community septic system at Becket Point in Jefferson County encountered human bones and Native American artifacts.³⁴ The contractor had to stop construction. An archaeologist was called in and conducted an investigation that allowed the project to be redesigned and to be completed. However, PUD staff “estimated the delays and additional engineering incurred because of the artifacts added about \$90,000 to the project’s cost.”³⁵ At least some of that money could have been saved by an upfront archeological investigation.

The Washington State Department of Archaeology and Historic Preservation has developed an archaeological predictive model that can predict where archaeological resources are likely to be located and where the department recommends archaeological surveys should be completed before earth disturbing activities and other uses and activities that can damage archaeological sites are undertaken.³⁶ Many shoreline areas in Whatcom County and Washington State, are rated “survey recommended: moderate risk,” “survey highly advised: high risk,” and “survey highly advised: very high risk.”³⁷ We recommend that the shoreline master program update should require pre-ground disturbance site investigations for sites that the Washington State Department of Archeology and Historic Preservation predictive model rates as “survey recommended: moderate risk,” “survey highly advised: high risk,” and “survey highly advised: very high risk.” The investigation should be carried out in consultation with affected Native American Tribes and Nations.

³⁴ Jeff Chew, *Jefferson PUD sticks with Beckett Point Connections* p. 8 (Washington Public Utility Districts Association [WPUDA]: Winter 2008) last accessed on July 16, 2019 at: <https://www.yumpu.com/en/document/view/46547248/connections-washington-public-utility-district-association/11>.

³⁵ *Id.* at p. 9.

³⁶ Washington State Department of Archaeology and Historic Preservation WISAARD webpage last accessed on May 8, 2019 at: <https://dahp.wa.gov/historic-preservation/find-a-historic-place>. The results of the predictive model are available for Whatcom County to use in planning and project reviews from the Washington State Department of Archaeology and Historic Preservation.

³⁷ *Id.*

Adopt regulations to protect aquifers and existing wells from salt water contamination

All of the islands in the county and its marine shorelines have the potential for wells to be contaminated by salt water.³⁸ WAC 173-26-221(2)(a) requires that shoreline master programs must provide for management of critical areas designated as such pursuant to RCW 36.70A.170(1)(d) located within the shorelines of the state with policies and regulations that ... [p]rovide a level of protection to critical areas within the shoreline area that assures no net loss of shoreline ecological functions necessary to sustain shoreline natural resources.” Critical areas include areas with a critical recharging effect on aquifers used for potable waters.³⁹

Salt water intrusion can worsen until wells “must be abandoned due to contaminated, unusable water.”⁴⁰ Salt water intrusion is often worsened by over-pumping an aquifer.⁴¹ The Western Washington Growth Management Hearings Board has held that Growth Management Act requires counties to designate vulnerable seawater intrusion areas as critical aquifer recharge areas.⁴² The Board also held that counties must adopt development regulations “to protect aquifers used for potable water from further seawater degradation.”⁴³ We recommend that the SMP Update include policies and regulations consistent with Ecology’s salt water intrusion policies to protect aquifers and wells from salt water contamination. The county should also establish a program to monitor the results of the initial chloride concentration tests, the annual chloride concentration tests, and the volumes of water pumped. The county should compare the volumes pumped with recharge estimates. Based on this and other available data, the county should periodically review and update its regulations to prevent increases in salt water intrusion.

³⁸ State of Washington Department of Ecology Water Resources Program, *Focus on Water Availability Nooksack Watershed, WRLA 1* p. 5 (Publication Number: 11-11-006, Nov. 2016) accessed on July 16, 2019 at: <https://fortress.wa.gov/ecy/publications/SummaryPages/1111006.html> and enclosed in a separate email with the filename “1111006.pdf.”

³⁹ WAC 173-26-221(2)(a).

⁴⁰ Emily B. Tibbott, *Seawater Intrusion Control in Coastal Washington: Department of Ecology Policy and Practice* p. 7 (United States Environmental Protection Agency Region 10, Office of Ground Water: Aug. 1992, EPA 910/9-92-023) last accessed on July 16, 2019 at: <http://nepis.epa.gov/Exe/ZyNET.exe/200060G4.TXT?ZyActionD=ZyDocument&Client=EPA&Index=1991+Thru+1994&Docs=&Query=&Time=&EndTime=&SearchMethod=1&TocRestrict=n&Toc=&TocEntry=&QField=&QFieldYear=&QFieldMonth=&QFieldDay=&IntQFieldOp=0&ExtQFieldOp=0&XmlQuery=&File=D%3A%5Czyfiles%5CIndex%20Data%5C91thru94%5CTxt%5C0000004%5C200060G4.txt&User=ANONYMOUS&Password=anonymous&SortMethod=h%7C-&MaximumDocuments=1&FuzzyDegree=0&ImageQuality=r75g8/r75g8/x150y150g16/i425&Display=p%7Cf&DefSeekPage=x&SearchBack=ZyActionI.&Back=ZyActionS&BackDesc=Results%20page&MaximumPages=1&ZyEntry=1&SeekPage=x&ZyPURL#>.

⁴¹ *Id.*

⁴² *Olympic Environmental Council v. Jefferson County*, Western Washington Growth Management Hearings Board (WWGMHB) Case No. 01-2-0015, Final Decision and Order (Jan. 10, 2002), at *8 & *16 motion for reconsideration denied *Olympic Environmental Council v. Jefferson County*, WWGMHB Case No. 01-2-0015, Order Denying Motion for Reconsideration (Feb. 8, 2002), at *3, both orders accessed on July 16, 2019 at: <http://www.gmhb.wa.gov/search/case>

⁴³ *Olympic Environmental Council v. Jefferson County*, WWGMHB Case No. 01-2-0015, Final Decision and Order (Jan. 10, 2002), at *15.

We strongly support updating the Geologically Hazardous Area standards

Whatcom County is susceptible to landslides.⁴⁴ The Shoreline Master Program (SMP) Guidelines, in WAC 173-26-221(2)(c)(ii)(B), provide: “Do not allow new development or the creation of new lots that would cause foreseeable risk from geological conditions to people or improvements during the life of the development.” Landslides are a type of geological hazards that can result in major impacts to people and property.

The March 22, 2014, Oso landslide “claimed the lives of 43 people, making it the deadliest landslide event in United States history. Of the approximately 10 individuals who were struck by the landslide and survived, several sustained serious injuries.”⁴⁵ So properly designating geologically hazardous areas and protecting people from geological hazards is very important.

It is important to understand that homeowner’s insurance does not cover the damage from landslides. “Insurance coverage for landslides is uncommon. It is almost never a standard coverage, and is difficult to purchase inexpensively as a policy endorsement.”⁴⁶

None of the Oso victims’ homes were covered by insurance for landslide hazards.⁴⁷ And that is common when homes are damaged by landslides.⁴⁸ For example, on March 14, 2011, a landslide damaged the home of Rich and Pat Lord.⁴⁹ This damage required the homeowners to abandon their home on Norma Beach Road near Edmonds, Washington. Because their homeowner’s insurance did not cover landslides, they lost their home.⁵⁰ This loss of what may be a family’s largest financial asset is common when homes are damaged or destroyed by landslides or other geological hazards.

Landslide buyouts are rare and when they occur the property owner often only recovers pennies on the dollar. The property owners bought out after the Aldercrest-Banyon landslide in Kelso,

⁴⁴ Whatcom County Sheriff’s Office Division of Emergency Management, *Whatcom County Natural Hazards Mitigation Plan* pp. 2-7 – 2-8 (FEMA Approval Dec. 15, 2016) accessed on July 16, 2019 at: <http://www.whatcomready.org/wp-content/uploads/2017/03/Whatcom-County-NHMP-2016-12-15-Approved.pdf>.

⁴⁵ Jeffrey R. Keaton, Joseph Wartman, Scott Anderson, Jean Benoit, John deLaChapelle, Robert Gilbert, David R. Montgomery, *The 22 March 2014 Oso Landslide, Snohomish County, Washington* p. 1 (Geotechnical Extreme Events Reconnaissance (GEER): July 22, 2014) accessed on May 13, 2019 at: http://www.geerassociation.org/index.php/component/geer_reports/?view=geerreports&layout=build&id=30. If the American territories are included, then the Oso landslide is the second deadliest landslide in American history. R.M. Iverson, D.L. George, K. Allstadt, *Landslide mobility and hazards: implications of the Oso disaster* 412 EARTH AND PLANETARY SCIENCE LETTERS 197, 198 (2015).

⁴⁶ Robert L. Schuster & Lynn M. Highland, *The Third Hans Cloos Lecture: Urban landslides: socioeconomic impacts and overview of mitigative strategies* 66 BULLETIN OF ENGINEERING GEOLOGY AND THE ENVIRONMENT 1, p. 22 (2007) accessed on May 13, 2019 at: ftp://193.134.202.10/pub/TRAMM/Workshop_EWS/Literature/Schuster_and_Highland_2007_Bulletin_of_Engineering_Geology_and_the_Environment.pdf

⁴⁷ Sanjay Bhatt, *Slide erased their homes, but maybe not their loans* *The Seattle Times* (April 2, 2014) accessed on May 13, 2019 at: http://old.seattletimes.com/html/latestnews/2023278858_mudslidefinancialxml.html.

⁴⁸ *Id.*

⁴⁹ Ian Terry, *Abandoned and trashed after mudslide, Edmonds house now for sale* *The Herald* (Feb. 11, 2015). The house is for sale after the bank who held the Lord’s mortgage took ownership of the home. *Id.* accessed on May 13, 2019 at: <http://www.heraldnet.com/article/20150211/NEWS01/150219829>.

⁵⁰ *Id.* at p. *6.

Washington destroyed their homes received 30 cents on the dollar.⁵¹ This underlines why preventing development in geologically hazardous areas is just plain ordinary consumer protection.

We strongly support designating the landslide deposits, scarps and flanks, and areas with susceptibility to deep and shallow landslides as geologically hazardous area

Futurewise strongly supports designating the landslide deposits, scarps and flanks, and areas with susceptibility to deep and shallow landslides as geologically hazardous areas. This will better protect people and property.

Landslides are capable of damaging commercial, residential, or industrial development at both the tops and toes slopes due to the earth sliding and other geological events.⁵² So the areas at the top, toe, and sides of the slope are geological hazards. We recommend these areas be designated as landslide hazards.

Require the review of geologically hazardous areas capable of harming buildings or occupants on a development site

We recommend that the regulations require review of any landslide capable of damaging the proposed development. Geological hazards, such as landslides are capable of damaging property outside the hazard itself. The 2014 Oso slide ran out for over a mile (5,500 feet) even through the slope height was 600 feet.⁵³ A 2006 landslide at Oso traveled over 300 feet.⁵⁴ Recent research shows that long runout landslides are more common than had been realized.⁵⁵ This research documents that over the past 2000 years, the average landslide frequency of long runout landslides in the area near the Oso landslide is one landslide every 140 years.⁵⁶ The landslides ran out from 787 feet to the

⁵¹ Isabelle Sarikhan, *Sliding Thought Blog, Washington's Landslide Blog* Landslide of the Week – Aldercrest Banyon Landslide July 29, 2009 accessed on May 13, 2019 at: <https://slidingthought.wordpress.com/2009/07/29/landslide-of-the-week-aldcrest-banyon-landslide/>

⁵² Jeffrey R. Keaton, Joseph Wartman, Scott Anderson, Jean Benoît, John deLaChapelle, Robert Gilbert, David R. Montgomery, *The 22 March 2014 Oso Landslide, Snobomish County, Washington* p. 1 & p. 68 (Geotechnical Extreme Events Reconnaissance (GEER): July 22, 2014).

⁵³ Jeffrey R. Keaton, Joseph Wartman, Scott Anderson, Jean Benoît, John deLaChapelle, Robert Gilbert, David R. Montgomery, *The 22 March 2014 Oso Landslide, Snobomish County, Washington* p. 56 & p. 144 (Geotechnical Extreme Events Reconnaissance (GEER): July 22, 2014).

⁵⁴ *Id.* at p. 1.

⁵⁵ Sean R. LaHusen, Alison R. Duvall, Adam M. Booth, and David R. Montgomery, *Surface roughness dating of long-runout landslides near Oso, Washington (USA), reveals persistent postglacial hillslope instability* GEOLOGY pp. *2 – 3, published online on 22 December 2015 as doi:10.1130/G37267.1; Geological Society of America (GSA) Data Repository 2016029, *Data repository for: Surface roughness dating of long-runout landslides near Oso, WA reveals persistent postglacial hillslope instability* p. 4 both enclosed in a separate email. Geology is a peer-reviewed scientific journal. Geology – Prep webpage accessed on Jan. 23, 2018 at: <http://www.geosociety.org/GSA/Publications/Journals/Geology/GSA/Pubs/geology/home.aspx#overview> and enclosed in a separate email.

⁵⁶ Sean R. LaHusen, Alison R. Duvall, Adam M. Booth, and David R. Montgomery, *Surface roughness dating of long-runout landslides near Oso, Washington (USA), reveals persistent postglacial hillslope instability* GEOLOGY p. *2, published online on 22 December 2015 as doi:10.1130/G37267.1.

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2,000 feet of the 2014 landslide.⁵⁷ So we recommend that Whatcom County require review of all geological hazards capable of harming a proposed lot or building site.

Require protection from all landslide runout areas

Landslides in Western Washington are capable of running out significant distances. The 1949 Tacoma Narrows Landslide, in Tacoma “failed catastrophically along steep” 300-foot high bluffs and ran out 1,500 feet into Puget Sound.⁵⁸ This is five times the bluff height. The 2014 Oso slide ran out for over a mile (5,500 feet) even though the slope height was 600 feet.⁵⁹ This was nine times the slope height. The 2013 Ledgewood-Bonair Landslide on Whidbey Island extended approximately 300 feet into Puget Sound.⁶⁰ In a study of shallow landslides along Puget Sound from Seattle to Everett, the average runout length was 197.5 feet (60.2 m) and the maximum runout length was 771 feet (235 m).⁶¹ So limiting landslide buffers to 50 feet or one third of the height of the slope for the top of slope buffer or half the height of the slope for the bottom of slope buffer will not adequately protect people and property.

The Joint SR 530 Landslide Commission recommends identifying “[c]ritical area buffer widths based on site specific geotechnical studies” as an “innovative development regulation[]” that counties and cities should adopt.⁶² So we support this recommendation. Construction should not be allowed in these areas.

Thank you for considering our comments. If you require additional information, please contact me at telephone 206-343-0681 Ext. 102 and email: tim@futurewise.org.

Very Truly Yours,



Tim Trohimovich, AICP
Director of Planning & Law

Enclosures

⁵⁷ Geological Society of America (GSA) Data Repository 2016029, *Data repository for: Surface roughness dating of long-runout landslides near Oso, WA reveals persistent postglacial hillslope instability* p. 4.

⁵⁸ Alan F. Chleborad, *Modeling and Analysis of the 1949 Narrows Landslide, Tacoma, Washington* xxxi ENVIRONMENTAL AND ENGINEERING GEOSCIENCE 305 p. 305 (1994).

⁵⁹ Jeffrey R. Keaton, Joseph Wartman, Scott Anderson, Jean Benoit, John deLaChapelle, Robert Gilbert, David R. Montgomery, *The 22 March 2014 Oso Landslide, Snohomish County, Washington* p. 56 & p. 144 (Geotechnical Extreme Events Reconnaissance (GEER): July 22, 2014).

⁶⁰ Stephen Slaughter, Isabelle Sarikhan, Michael Polenz, and Tim Walsh, *Quick Report for the Ledgewood-Bonair Landslide, Whidbey Island, Island County, Washington* pp. 3 – 4 (Washington State Department of Natural Resources, Division of Geology and Earth Resources: March 28, 2013) accessed on May 13, 2019 at: http://www.dnr.wa.gov/publications/ger_qr_whidbey_island_landslide_2013.pdf.

⁶¹ Edwin L. Harp, John A. Michael, and William T. Laprade, *Shallow-Landslide Hazard Map of Seattle, Washington* p. 17 (U.S. Geological Survey Open-File Report 2006–1139: 2006) accessed on May 13, 2019 at: <http://pubs.usgs.gov/of/2006/1139/>.

⁶² The SR 530 Landslide Commission, *Final Report* p. 31 (Dec. 15, 2014) accessed on May 13, 2019 at: http://www.governor.wa.gov/sites/default/files/documents/SR530LC_Final_Report.pdf.