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Ms. Chris Shirley  
Climate Change Resilience Coordinator  
Department of Land Conservation and Development  
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Salem, OR 97301

*Submitted via email ([christine.shirley@state.or.us](mailto:christine.shirley@state.or.us))*

*RE: The Pew Charitable Trusts' Comments on Oregon's Draft 2020 Climate Change Adaptation Framework*

Dear Ms. Shirley:

Thank you for the opportunity to comment on the draft 2020 Oregon Climate Change Adaptation Framework (Framework). With the increase in the occurrence and severity of climate-related impacts in Oregon, including flooding, wildfire, and damaging storms, this update of the original 2010 Framework is timely and necessary.

Accordingly, we commend Oregon for this comprehensive update and note the importance of the necessary actions and sector-specific strategies identified in the draft Framework as the umbrella for adaptation efforts. Since the majority of Pew's programmatic work in Oregon focuses on coastal and marine conservation, our detailed comments presented below will target necessary actions and strategies that intersect with this issue.

Overall, we recommend that the Department of Land Conservation and Development (DLCD) and partner agencies ("Workgroup") consider the following:

- **Explicitly leverage planning, policies and outcomes that are currently being developed in response to Governor Brown's Carbon Policy Executive Order.** Climate mitigation goals, which focus on reducing greenhouse gases, and adaptation goals, which help communities adapt to inevitable changes, are distinct but interconnected. Many NWL strategies developed for mitigation purposes<sup>1</sup> can also contribute significantly to adaptation, creating synergies and economies of scale that would be invaluable given resource constraints. Accordingly, we recommend that the Workgroup explicitly leverages strategies and policies being developed in response to Governor Brown's Carbon Policy Executive Order ([EO 20-04](#)), including the development of Oregon's first "Natural and

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<sup>1</sup> See: Graves RA, Haugo RD, Holz A, Nielsen-Pincus M, Jones A, Kellogg B, et al. (2020) Potential greenhouse gas reductions from Natural Climate Solutions in Oregon, USA. PLoS ONE 15 (4): e0230424. <https://doi.org/10.1371/journal.pone.0230424>

Working Lands” (NWL) strategy. In developing the NWL strategy, the Global Warming Commission aims to build an inventory of the carbon sequestered in state lands and tidal areas and develop mitigation goals relative to these landscapes, creating leverage opportunities for adaptation. For example, efforts to conserve and restore coastal wetlands that serve as “blue carbon” sinks can also address several adaptation strategies noted in the draft Framework, including sea level rise, erosion, fisheries, and saltwater intrusion.

- **Recognize and elevate nature-based policy solutions that address specific impacts on coastal resources and communities.** Oregon’s coastal lands and waters are particularly vulnerable to climate change, including sea-level rise induced drowning of coastal wetlands, acidifying waters, and associated impacts on rural livelihoods. Protecting and restoring natural defenses like tidal forested wetlands and submerged aquatic vegetation (SAV), which help mitigate and/or ameliorate climate impacts, should be a central element in coastal adaptation strategies. We note that identifying and implementing nature-based solutions, such as conserving coastal areas to support wetland migration and instituting new protective measures for submerged aquatic vegetation (SAV), can start now via updates to state estuary management plans.
- **Create specific action plans with policy priorities and timelines.** In order to ensure that the goals and strategies laid out in the Framework are operationalized in a timely fashion, we recommend action plans that identify “low hanging fruit” opportunities that could start immediately, as well as specific benchmarks and metrics of success that would be reviewed regularly to track progress and course correct as needed.

Pew’s detailed comments on parts 2 and 3 of the Framework (*Actions to Implement Comprehensive Climate Change Adaptation and Vulnerabilities* and *Strategic Responses by Sector*) are included below.

## **Actions to Implement Comprehensive Climate Change Adaptation and Vulnerabilities**

### ***Action 1: New Leadership Structure***

Climate change impacts transcend individual agencies and policies, many of which were created decades ago when little was known about climate-related threats. Accordingly, we support the Framework’s emphasis on creating a new agency leadership structure for state resilience efforts.

Since developing new governance structures will take time, we agree with tasking the Natural Resource Cabinet to take on this leadership role over the short-term and recommend that this body develop an action plan and timeline as a first order of priority. The action plan should identify “low hanging fruit” opportunities to start implementation of the Framework. For example, some of Oregon’s estuary management plans are in the process of being updated, and concurrently the state is formulating a Guidance Document on updating these plans for local jurisdictions. These efforts provide an opportunity to explicitly integrate climate considerations into updated policies and regulations in coastal areas that address sea level rise, ocean acidification and other issues that

require adaptation. Leveraging efforts underway through EO 20-04, including identifying opportunities, co-benefits, and potential revenue streams in support of the state’s adaptation priorities, could also represent a near-term, actionable priority.

With respect to proposed longer-term leadership structures, Oregon could evaluate options for establishing a formalized hub in the form of a resiliency office that would align the various policy and regulatory tools and agency partnerships to strategically focus limited resources. For example, this office could coordinate various agencies to integrate floodplain, stormwater and non-point source pollution management with nature-based solutions to protect communities while conserving and restoring important habitats. We recommend drawing upon examples from the West Coast and across the nation, such as [Washington’s Puget Sound Partnership](#),<sup>2</sup> a science-based, non-regulatory state agency that connects and leverages hundreds of organizations working on a shared mission to protect and restore the health of Puget Sound.

Pew also recommends including Tribal Nations in identifying and implementing shorter-term actions and long-term governance reforms. This would enable the state and Tribal Nations to leverage resources, management agencies and departments, amplifying the reach of climate adaptation strategies. As noted in the Framework, Tribal Nations are actively working in the climate adaptation space.

### ***Action 2: Diversity, Equity, and Inclusion (DEI)***

Minority and low-income communities will be disproportionately affected by climate change. Without any major metropolitan hub on Oregon’s coast, coastal communities are a particularly vulnerable group. The cultural heritage theme also notes that Oregon’s Tribal Nations are uniquely vulnerable and disproportionately affected by climate impacts.

Pew commends the recognition of these challenges in the draft Framework and the creation of the Climate Equity Blueprint to assist state agencies in integrating DEI best practices into climate-related work. In addition to informing the state’s adaptation efforts, we note that the Climate Equity Blueprint is applicable for state agency operations generally, and this new resource could be used across the board by Oregon.

We would like to highlight National Oceanic and Atmospheric Administration (NOAA)-funded research of the New Jersey Coastal Management Program and Rutgers University that could be a valuable resource for incorporating DEI into adaptation strategies. This [“Seat at the Table” project](#)<sup>3</sup> developed decision-support tools, resilience planning guidance, and training and policy options for managers to address the needs of socially vulnerable populations.

### ***Action 3: Vulnerability Assessments***

Pew supports the proposed statewide vulnerability assessment that will serve as a foundation for adaptation efforts and recommends evaluating similar work across the nation to inform next steps. North Carolina’s 2020 [Climate Risk Assessment and Resiliency Plan](#), developed through a highly

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<sup>2</sup><https://www.psp.wa.gov/>

<sup>3</sup><http://eac.rutgers.edu/a-seat-at-the-table-integrating-the-needs-and-challenges-of-underrepresented-and-socially-vulnerable-populations-into-coastal-hazards-planning-in-new-jersey/>

collaborative, inter-agency and stakeholder engagement process, conducted vulnerability assessments by critical sectors, specified preliminary actions currently underway or which could be taken to reduce risk over the next five years, and incorporated recommendations for nature-based solutions to enhance ecosystem resiliency and sequester carbon in the state's natural and working lands. The [Georgetown Climate Center's Adaptation Clearinghouse](#), an on-line database and networking site, has additional information and case studies from across the nation that could be useful for the Workgroup.

Vulnerability assessments conducted in the coastal zone may have additional complexity given the range of climate impacts (e.g., sea level rise, erosion, saltwater intrusion, rising ocean temperatures and ocean acidification and hypoxia) in this area. We recommend that the Workgroup draw from the extensive experience of [Oregon's Coastal Management Program](#) in advancing resilience and addressing coastal hazards. In addition, we note that for Oregon's eight coastal counties, vulnerability assessments will require tailored approaches that address coastal infrastructure, economies, and natural resources that are particularly at risk from climate impacts; and recommend drawing upon the work completed for Clatsop and Tillamook counties.<sup>4</sup> Overall, these assessments can aid in setting targeted resilience goals and establishing a framework for "shovel ready projects," as well as developing plans and policies that the Coastal Management Program in its regulatory role can readily implement.

***Action 4: Improve interagency coordination and information sharing.***

Pew agrees that improving interagency coordination and information sharing will be a critical element of implementing adaptation strategies. We note that the Oregon Coastal Management Program, as a networked program, can play a key role in aligning climate adaptation and mitigation policies, developing regulatory and financial solutions, fostering coordination, and enhancing the role that state partner agencies already play in the Coastal Management Program.

The Framework could propose informal avenues to improve information sharing and coordination throughout all levels of state government, such as an annual Adaptation Summit (modelled on the state DEI conference) for state employees to solicit ideas, discuss new research, and share models being implemented in other states or countries. The Summit would allow broad representation of engaged staff, not just agency leadership, as well as provide opportunities to dive into sector specific and geography-specific challenges.

Creating a broadly accessible data hub could be another effective vehicle for information sharing. For example, leveraging the State's geospatial framework could provide a clearinghouse for information gathered through the aforementioned NWL strategy, enabling agencies to apply this data for nature-based adaptation strategies such as wetlands protection and restoration. Coordinating, aligning, troubleshooting, and frequently updating spatial data will allow for rapid response (as demonstrated by Oregonian's dependence on fire and smog data platforms this summer) and adaptive management efforts.

***Action 5: Integrate responses to climate change throughout agency operations***

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<sup>4</sup> Weber, Jeff, Oregon Department of Land Conservation and Development (DLCD). 2015. Regional Framework for Climate Adaptation for Clatsop and Tillamook Counties.

Pew agrees that integrating responses to climate change throughout agency operations is a necessary action, and one that can be started in the short term. We recommend looking at similar efforts in California, such as the state’s [guidebook for agencies](#) and the [Safeguarding California Plan](#). Oregon may be able to benefit from lessons learned in California, as well as identify near term opportunities for regional coordination in shared watersheds and infrastructure.

Operationalizing strategies through specific regulatory reforms and updates is a critical but admittedly difficult next step. There may be an opportunity to learn from other states that have engaged in this effort. We note New Jersey’s Protecting Against Climate Threats ([PACT](#)) initiative, which is modernizing air quality and environmental land use regulations to enable governments, businesses and residents to effectively respond to current climate threats and reduce future climate damages. Undertaking a similar systematic review of the state’s regulatory landscape could result in opportunities to update policies governing land use, transportation and other sectors to explicitly include climate considerations that would serve to build resiliency in communities and protect critical natural resources. The state’s [Fish Passage Law](#), as one example, already requires maintaining/improving connectivity and stream/floodplain function for migratory fish. Restoring water flow, functioning floodplains, and increasing the time water is held within watersheds is an important adaptation strategy that could be further leveraged to meet state goals. This is particularly important for Oregon’s estuaries that provide habitat for economically important species for coastal communities. Restoring tidal flows can help with adaptation to increasing sea levels, water temperatures, and storms;<sup>5</sup> while also supporting carbon sequestration and economically important listed species threatened by climate change.

## **Climate Change Effects and Strategic Responses by “Theme”**

### ***Economy***

We agree with the draft Framework’s finding that local economies that depend on natural resources for their livelihood are particularly vulnerable to climate change, including agricultural and fishing communities, Tribal Nations, and communities that rely on outdoor recreation and tourism. The Framework’s specific focus on soil health, forest and land management and fish habitat represents opportunities to integrate both climate adaptation and mitigation through improved management and conservation. For example, [Virginia has recently received funding](#) from the U.S. Department of Agriculture’s (USDA) Natural Resource Conservation Service to map and calculate soil carbon stocks in the coastal zone. These data will help inform land use decisions in estuaries by improving understanding of the amount of “blue carbon” stored (or released if degraded) in these systems.

The Framework also identifies research underway with Washington, California and the U.S. Forest Service (USFS) to describe anticipated climate impacts related to forest and other land use management. We note the opportunity to connect this research with the aforementioned NWL strategy to inform management targets set for both adaptation and mitigation purposes.

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<sup>5</sup> Ramsar Convention Secretariat. 2018. Wetland Restoration for Climate Change Resilience. Ramsar Briefing Note. [https://www.ramsar.org/sites/default/files/documents/library/bn10\\_restoration\\_climate\\_change\\_e.pdf](https://www.ramsar.org/sites/default/files/documents/library/bn10_restoration_climate_change_e.pdf)

We would like to highlight the need to address the issue of coastal land degradation related to sea level rise impacts and the opportunity to get ahead of the problem with innovative solutions. For example, tidal forested wetlands have [been identified as particularly resilient in the face of sea level rise](#)<sup>6</sup> as well as significant carbon sinks. Restoration areas can be identified and prioritized on degraded lands with potential to restore that habitats that build resilience and store carbon. Incorporating “blue carbon” could also result in innovative financing opportunities via carbon markets.

With regards to the Framework’s call to “invest in protection, restoration, and enhancement of priority areas for fish and prepare to transition to new fisheries management regimes,” we support this forward-looking approach and note that similar efforts are underway with regards to federal fisheries management. A regional example includes the [Pacific Fishery Management Council’s Climate and Communities Initiative](#)<sup>7</sup>, which aims to better understand the effects of near-term climate shifts and long-term climate change on fish, fisheries, and fishing communities and identify ways in which the Council could incorporate such understanding into its decision making. In addition, the estuary management plan update processes currently underway provide an opportunity to pilot tools and policies to protect and restore habitat that will provide critical climate refugia for fish and invertebrates that support rural livelihoods. For example, the Partnership for Coastal Watersheds in the Coos Bay estuary is embarking on a Restoration Opportunity Inventory mapping project to identify parcels that are suitable for restoration, while also considering landward migration so that local land use decisions can be informed by both current and future conditions.

## ***Natural World***

### *Terrestrial*

The Framework identifies several important areas to incorporate climate resilience into the management, protection and restoration of Oregon’s landscapes, including its wetlands and estuaries. We agree with focusing efforts in areas with high connectivity of habitats and ecosystem function, and steering development away from these areas that will be increasingly important as climate refugia in the years to come.

As noted in the previous section, Oregon’s estuary management plans provide a vehicle to operationalize many of the strategies included in the Framework in the short to medium term. Updating these plans, many of which are decades old, will allow managers to incorporate new mapping tools and research, including greater understanding of restoration ecology, salmon recovery, species life history requirements, fluvial geomorphology, carbon storage potential and other issues. New land use policies could promote the use of green infrastructure as well as focus protection and restoration efforts in the specific high value areas noted above.

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<sup>6</sup> Brophy, L.S. 2019. Comparing historical losses of forested, scrub-shrub, and emergent tidal wetlands on the Oregon coast, USA: A paradigm shift for estuary restoration and conservation. Prepared for the Pacific States Marine Fisheries Commission and the Pacific Marine and Estuarine Fish Habitat Partnership. Estuary Technical Group, Institute for Applied Ecology, Corvallis, Oregon, USA. [https://appliedeco.org/wp-content/uploads/Brophy\\_2019\\_Oregon\\_tidal\\_swamp\\_and\\_marsh\\_losses\\_FINAL\\_Dec2019.pdf](https://appliedeco.org/wp-content/uploads/Brophy_2019_Oregon_tidal_swamp_and_marsh_losses_FINAL_Dec2019.pdf)

<sup>7</sup> <https://www.pcouncil.org/actions/climate-and-communities-initiative/>

This work presents another opportunity for the Workgroup to leverage both climate mitigation and adaptation efforts; for example, by proactively protecting areas to facilitate upland migration of coastal habitats (i.e., landward migration zones), managers would ensure that the carbon currently stored in these areas remains sequestered and could link efforts with goals that will be developed and tracked through the new NWL strategy. Another strategy that could advance both mitigation and adaptation goals would be to restore tidal connections in areas with failing tide gates, which could result in substantial reductions per acre in methane emissions.<sup>8</sup> There is [work underway in Massachusetts](#) to bring a tidal restoration project to the carbon markets; if successful, this could offer a precedent for securing additional funding resources. In addition, the Workgroup could assess financing-related recommendations from the National Estuarine Research Reserve System funded [Scoping Assessment for Pacific Northwest Blue Carbon Finance Projects](#).<sup>9</sup>

### *Ocean*

The Framework identifies ocean acidification and hypoxia (OAH) as a critical resilience issue and recommends incorporating OAH adaptation resilience strategies in existing planning and decision-making frameworks. Pew agrees with this strategy and recommends the Workgroup identify specific and actionable policy reforms to implement over the next five years. Oregon's marine and estuarine ecosystems that are directly threatened by OAH also provide opportunities to ameliorate and build resilience to the adverse impacts of OAH. Protecting and restoring SAV habitats such as eelgrass has the potential to both combat the impacts of ocean acidification<sup>10</sup> and ensure that nearshore and estuarine environments continue to provide the ecosystem services that drive healthy coastal communities. Additionally, emerging research indicates that SAV is an important carbon sink.<sup>11</sup>

As Pew noted in its July 2019 comment letter<sup>12</sup> on the OAH Action Plan, the state can undertake the following steps now:

- Revise the removal/fill permitting process to ensure adverse impacts to eelgrass are mitigated according to the best available science and restoration practices.
- Update estuary management plans to include the latest mapping on SAV presence/absence, abundance, and distribution.
- Designate SAV protected areas, buffer zones and other spatial protections, particularly for eelgrass beds within Development Estuaries within Development Management Units, in order to stem further loss of this habitat

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<sup>8</sup> Kroeger, K.D., Crooks, S., Moseman-Valtierra, S. et al. Restoring tides to reduce methane emissions in impounded wetlands: A new and potent Blue Carbon climate change intervention. *Sci Rep* 7, 11914 (2017). <https://doi.org/10.1038/s41598-017-12138-4>

<sup>9</sup> S. Crooks, L. Beers, S. Settelmyer, E. Swails, S. Emmett-Mattox, and C. Cornu. 2020. Scoping Assessment for Pacific Northwest Blue Carbon Finance Projects. A report by Silvestrum Climate Associates, TerraCarbon LLC, Strategic Solutions LLC and the Institute for Applied Ecology.

<sup>10</sup> Nielsen, K., Stachowicz, J., Carter, H., Boyer, K., Bracken, M., Chan, F., Chavez, F., Hovel, K., Kent, M., Nickols, K., Ruesink, J., Tyburczy, J., and Wheeler, S. Emerging understanding of the potential role of seagrass and kelp as an ocean acidification management tool in California. California Ocean Science Trust, Oakland, California, USA. January 2018.

<sup>11</sup> Sherman, K., and L.A. DeBruyckere. 2018. Eelgrass habitats on the U.S. West Coast. State of the Knowledge of Eelgrass Ecosystem Services and Eelgrass Extent. A publication prepared by the Pacific Marine and Estuarine Fish Habitat Partnership for The Nature Conservancy.

<sup>12</sup> <https://www.pewtrusts.org/en/research-and-analysis/speeches-and-testimony/2019/07/09/pew-commends-oregon-plan-to-address-ocean-acidification>

- Leverage federal policies (e.g., federal consistency under the Coastal Zone Management Act and Magnuson Stevens Act's essential fish habitat) to steer impacts away from SAV.

The Pew Charitable Trusts is committed to supporting the important work conducted by Oregon to sustain coastal and marine ecosystems and the communities that depend upon them in the face of climate change. We thank you for the opportunity to comment on the Draft Framework and look forward to the development of policies and implementation of the Framework in the coming years.

Sincerely,



Jennifer Browning  
Director, Conserving Marine Life in the United States