

To: Work Group on Agriculture, Forests, Fisheries, Rural Communities, and Tribes
From: Bob Rees, Association of Northwest Steelheaders
Bob Van Dyk, Wild Salmon Center
Brad Warren, Working Group on Seafood and Energy
Chandra Ferrari, Trout Unlimited
Liz Hamilton, Northwest Sportfishing Industry Association
Re: Clean Energy Jobs Legislation and Need for Natural Resource Investments
Date: November 2, 2017

Oregon's natural resources, including our fisheries, face daunting pressures as a result of climate change. Substantial investments are needed to protect and sustain our natural resources in the face of these pressures. Oregon has a variety of programs and agencies that can lead the effort to ensure resilience in the face of climate change, but significant increases in resources are needed as well as increased coordination among agencies for a common and comprehensive plan for climate adaptation for fish and wildlife resources.

The Challenge of Climate Change:

Climate change threatens disastrous consequences for both people and the environment. No longer is climate change a potential threat in a distant future, in fact "Oregon's climate has already warmed considerably, and the cause is most likely rising greenhouse gases."¹ We must take steps to both limit our emissions while at the same time providing for the resilience of our natural resources. Though Oregon is only a small part of global emissions, the solution to global warming will only be found if every state and country, large and small, takes step to reduce emission of greenhouse gases. We must do our part.

While reducing emissions, we must also work to adapt to the changes that climate change will cause to our state. Adaptation and resilience require investment in natural resources. Below we note some of the projected effects of climate change on our fisheries and freshwater resources, but the projected affects on Oregon's natural resources and communities extend far beyond the those noted here.²

Effects on Fisheries and Water Resources:

The *Third Oregon Climate Assessment Report of January 2017* contains alarming information on the projected effects of climate change on our fisheries. Work by the Columbia River Basin Tribes underline these concerns.³ Fish habitat in Oregon is expected to change significantly, and for the worse.

¹ Dalton, M.M., et. al. (2017) The Third Oregon Climate Assessment Report, Oregon Climate Change Research Institute, College of Earth, Ocean and Atmospheric Sciences, Oregon State University, Corvallis, OR.

² For example, more frequent large fires and a longer fire season are predicted, as well as disease and insect outbreaks.

³ Sampson, D. (2015) Columbia River Basin Tribes Climate Change Capacity Assessment, Institute for Tribal Government, Hatfield School of Government, Portland State University, OR.

Freshwater Effects:

- Warmer temperatures will mean less snowpack and less water for fish, especially in the summer.
- Earlier snowmelt will change streamflow timing that salmon have evolved to use.
- Higher winter streamflows increase the risk of scouring of the streambeds where salmon spawn.
- Increased temperatures will create more lethal conditions for salmon, steelhead, and bull trout, which are coldwater fish.
- Shorter intervals between more frequent extreme water conditions, such as the severe 2015 drought that was followed in 2017 by flood events, will further stress salmon runs.

Marine and Coastal Effects:

- Loss of estuarine habitat due to sea level rise.
- Warmer oceans that provide less food for salmon and more predators.
- Broad potential disruptions in the food chain due to ocean acidification (OA) and hypoxia (low oxygen levels).
- Crab, mussel and clam harvests disrupted by increasing toxic algae blooms linked to warm, high-CO2 water.
- Acidification forces costly adaptive maneuvers to protect young oysters from acidified seawater.
- Overheated river waters kill returning adult salmon.

These changes will affect far more than fisheries of course, as communities face related challenges like increased flooding and water shortages.

Adaptation and the Clean Energy Jobs Bill:

- 1) We support dedication of 30% of all revenues generated (after constitutionally allocated funds are deducted) to the purpose of implementing climate change adaptation and resiliency actions that ensure sustainability for our renewable natural resources. These funds should be directed toward existing agencies and programs to the extent possible. Agencies like Fish and Wildlife, Water Resources, Forestry, Agriculture, and the Watershed Enhancement Board already have relevant plans and mechanisms that could be amended, enhanced, and funded by these resources. For example, the Integrated Water Resources Strategy identifies a variety of actions necessary to strengthen the resiliency of ecosystems to the impacts of climate change that require enhanced funding to be fully and effectively implemented.
- 2) We support allowing use of allowances to achieve 8% of required emission reductions. Offsets provide a powerful tool to harness private capital for projects that “draw down” carbon and safely store it in productive natural environments. Offsets today help to finance important forest conservation projects that sequester carbon while enhancing climate-resilience of fish habitat. Offsets protocols now exist for carbon-sequestering coastal marine and estuarine habitats, providing a

- tool to simultaneously achieve multiple benefits: restoring salmon populations, strengthening local climate resilience, and improving local flood control.
- 3) Of the funds allocated to the State Highway Fund, a portion should be prioritized to address climate resilience along with transportation needs. For example, projects that address fish passage impediments, storm proofing roads, or relocating roads out of floodplains could both improve transportation and improve the resilience of our natural resources.

Specific Adaptation Strategies:

Many things could be done to buffer our fisheries against the effects of climate change.

Coastal/ocean Strategies

- inventory and protect land for inland migration of intertidal and wetland habitats on open coast and estuaries
- protect and restore eelgrass beds to mitigate ocean acidification (OA)
- protect and restore tidal marshes as carbon sinks (also for flood storage capacity)
- protect ocean areas that may add resilience to ecosystem (OA refugia, areas of high diversity, etc.)
- Tidegate replacement

Inland Strategies

- Protect cold water sources (land purchases or easements)
- Invest in winter water storage solutions
- Invest in water conservation technologies (provide real water savings)
- Secure instream water rights
- Provide further protections to riparian corridors, for both rainfall retention and shade.
- Invest in riparian planting to shade streams
- Increase effort in invasive species mgmt. (prevention, control, eradication)
- Install climate resilient passage (culverts/low head dams etc), with consideration for larger projected floods
- Screen diversions
- Encourage watershed restoration strategies such as beaver reintroduction to protect and naturally increase water storage