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**California Office**  
P.O. Box 29370  
San Francisco, CA 94129-0370  
Tel: (415) 561-5080  
Fax: (415) 561-5464

[www.pcffa.org](http://www.pcffa.org)  
Reply to: [fish1ifr@aol.com](mailto:fish1ifr@aol.com)

**Please Respond to:**  
 **Northwest Office**  
P.O. Box 11170  
Eugene, OR 97440-3370  
Tel: (541) 689-2000

**Statement on the Value of Columbia Basin Salmon  
by  
Glen H. Spain, Northwest Regional Director, Pacific Coast  
Federation of Fishermen's Associations (PCFFA) and the Institute  
for Fisheries Resources (IFR)**

**28 June 2022**

Governor Inslee and Senator Murray, to their great credit, have begun the long overdue process of crafting a new pathway for the Pacific Northwest out of the morass and gridlock over Columbia Basin salmon restoration issues that has gripped the region for nearly 30 years, all while the irreplaceable salmon<sup>1</sup> runs of the Columbia River, once the largest salmon runs in the world, continued to decline.

The release of their recently commissioned report *Lower Snake River Dams: Benefit Replacement Draft Report (June 9, 2022)* (the Report) is a landmark in that effort – but must be viewed as only the beginning. The period for public comments on the Report is currently underway. These comments are supplemental to other comments that may be presented by the Commercial Fishing Industry Representatives to the Columbia Basin Partnership, and are offered to provide better socio-economic as well as historical context for these upcoming decisions from the viewpoint of the region's several billion-dollar commercial salmon fisheries.

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<sup>1</sup> For purposes of this discussion, we use the term "salmon" to include all the various species of the genus *Oncorhynchus*, which includes steelhead as well as Chinook, Coho, sockeye, chum and pink salmon, all of which may occur within the Columbia Basin. Some species, such as steelhead, are primarily recreational fishery stocks, while others like Chinook, Coho and sockeye are also or primarily commercially fished. But all these fish are cold-water, anadromous species requiring similar in-river conditions to successfully spawn and rear.

Over the next several months, the Pacific Northwest has a golden opportunity to push for a serious Columbia River salmon recovery plan that finally does something real and lasting to address the devastating impacts on the Pacific Northwest's valuable salmon fisheries from four federal Lower Snake River dams. This chance to finally get it right comes after decades of trying to fix a broken system, at a cost of several billions of dollars and climbing, with little or no result. This is because the minor tweaks and adjustments to the system previously called for (out of political expediency) have never directly dealt with the main cause of these declines – the four lower Snake River dams.

After decades of dam building on the Columbia, four final dams – Ice Harbor, Lower Monumental, Little Goose and Lower Granite – were built on the Snake River, the Columbia River's largest tributary, in the 1960's to 70's. Before they were constructed, however, Washington's own Department of Fisheries strongly opposed these dams and warned that the proposed Lower Snake River dams would spell disaster for salmon, as follows:

“The development would remove part of the cost of waterborne shipping from the shipper and place it on the taxpayer, jeopardizing more than one-half of the Columbia river salmon production in exchange for 148 miles of subsidized barge route. This policy of water development, the department maintains, is not in the best interest of the over-all economy of the state. Salmon must be protected from the type of unilateral thinking that would harm one industry to benefit another. Loss of the Snake River fish production would be so serious that the department has consistently opposed the fourphase lower dam program that would begin with Ice Harbor dam near Pasco.” (From the State of Washington Department of Fisheries *Annual Report* for 1949.)

Unfortunately, that prediction made by the Washington Department of Fisheries all the way back in 1949 about the damage four Lower Snake River federal dams would do to the region's most valuable salmon fisheries has now come to pass. Once built, they proved to be simply four dams too many. Furthermore, the relatively minor economic benefits they provided were never justified, as compared to the enormous economic, ecological and social toll taken by lost fishing economies. This is also why the project was opposed for decades by the US Army Corps of Engineers, as well as by the States of Washington and Idaho.<sup>2</sup>

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<sup>2</sup> For a fascinating historical summary of the decades of heated debate over the proposed construction of the Lower Snake River dams, and how this proposal was ultimately just rammed through Congress anyway, against the recommendations of the USACE and both Washington and Idaho State governments, see Keith C. Petersen's book, *River of Life: Channel of Death – Fish and Dams on the Lower Snake*, Confluence Press (1995), particularly Chapter 5 (pp. 87-97). These dams were, of course, built two decades before any legal requirements for environmental impacts analysis, which only became obligatory for federal construction products with the passage of the National Environmental Policy Act (NEPA) (42 U.S.C. §4321 et seq.) in 1969. Thus there has never been a formal NEPA analysis of their impacts.

Today, nearly all the salmon species and subspecies “runs” of salmon once abundant in the Columbia Basin are listed as “threatened” with extinction, or “endangered” and facing imminent extinction, under the federal Endangered Species Act (“ESA,” at 16 U.S.C. §1531, *et seq.*) Many of those salmon species are also the basis of economically and culturally important commercial, recreational, and Tribal fisheries which have enormous value to the Pacific Northwest economically, ecologically and culturally, as set forth in more detail below.

## **1.0. Identifying and Accounting for Non-Monetized Values**

In the following discussion of the value of intact salmon-bearing river ecosystems, we use the Pacific Northwest’s Columbia Basin-origin salmon runs and their related commercial and other fisheries as but one obvious example of the many economic and other values that will be positively affected by having more protective Columbia Basin water quality (especially temperature) standards, a result of better fish passage after the Lower Snake River dams have been breached, than currently exists.<sup>3</sup>

Salmon harvests have the benefit of being easily quantifiable in monetary terms of “fiscal and economic effects.” But additionally, there are numerous other salmon-related values and benefits that will flow from improved water quality as well as improved fish passage in the Columbia Basin, including both cultural and ecosystem benefits, which are termed “non-monetized values,” but which – although difficult to translate directly into dollars – are nonetheless of *great value* to the Pacific Northwest as well as to society as a whole, including multiple stakeholder groups, communities and their own economies.

These non-monetized cultural and ecosystem values cannot be ignored! When asking the bigger question not just of costs, but rather, “What are all the values and benefits of an intact and functioning riverine ecosystem?” these so-called “non-monetized values” may include multiple cultural, lifestyle, food production, clean water and other social benefits that, if they could be monetized, would likely *greatly exceed* whatever purely localized (and purely monetary) value could be obtained by industrializing those same river systems.

Indeed, the Pacific Northwest’s still relatively healthy river systems and watersheds are a major component of what makes life livable in our region, providing multiple societal benefits which in

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<sup>3</sup> Since salmon are a highly migratory set of species, and circulate widely throughout the North Pacific Ocean, Columbia-origin salmon runs are a major component of the entire Pacific Northwest’s salmon fisheries, especially since these salmon mostly migrate north into cooler waters where they can be harvested in Washington, British Columbia and Alaska fisheries. But Columbia-origin salmon also make up a significant portion of ocean salmon catches well into Oregon and northern California. Indeed, weak stock management constraints are not uncommon on harvest quotas of Oregon and northern California ocean salmon fisheries triggered by weak Columbia River salmon stocks.

turn create multiple economic opportunities, including providing the vast majority of the region's potable drinking water for its growing population.

## **2.0. Economists' Guidance Principles for Salmon Restoration Project Costs vs. Benefits Analysis**

When considering whether or not to go forward with any particular salmon habitat restoration proposal (dam removals being one type of this restoration effort), one needs to look objectively at both the social costs as well as the social benefits of such an action, and on both sides of the equation. This is usually done at the agency decision-maker level through some type of "costs-benefits" analysis.

However, as a number of professional natural resource Economists have noted, while purely economic costs of compliance (or change, in this case) are important in many analyses of impacts, both the economic and non-monetized social benefits of salmon habitat restoration proposals are often given short-shrift or ignored in most current, standard agency "costs-benefits" analyses. *This initial analytical bias greatly distorts the economic balance sheet and thus unfairly pre-biases public policy decision-making toward one end of the spectrum.*

The socio-economics analysis team for this report is in danger of falling into this trap, when it: (a) fails to account for all the "costs of doing nothing," including the enormous costs to society as a whole of the loss of the remaining remnants of region's wild salmon resource, if nothing is done and the current highly destructive *status quo* is allowed to continue to push them toward extinction; (b) when it does not take into account the enormous federal subsidy that is being given to a handful of grain barging companies, including billions of dollars in mitigation measures intended to prop up the grain transportation system the dams created in what has been called the most highly subsidized transportation corridor in the world; (c) when it assumes that there will be no efforts by energy managers to compensate, adjust or adapt to power losses resulting from the removal of Lower Snake River dams by shifting to other renewable power generation resources (which are ever more abundant at ever lower costs), including assuming the most pessimistic (and thus expensive) net power loss scenarios with little effort to mitigate those losses, and; (d) failing to account for not only the enormous economic and socio-economic value of recovering currently depressed salmon runs to society, in effect pre-assuming that the current salmon runs will not greatly improve in abundance above recent highly depressed baselines, once the impediments to fish passage the dams create are removed.

Professional Economists tell us that we must account for the fact that salmon recovery (and by extension, water pollution mitigation efforts) will generate economic benefits as well as costs. To understand the net benefit (a net cost if negative) to the economy as a whole, one must consider the effects on the production of all goods and services. The effects on goods and services that are

traded in markets, such as commercial salmon, timber production, and agricultural production, should receive the same consideration as those, such as recreational fishing, clean streams, and biodiversity (i.e., non-market values) that are not. Economists also tell us that a full accounting must be provided of the true value of each affected good or service, taking into account the market price, where appropriate, as well as all factors, such as subsidies, taxes, and environmental externalities, that may distort the level of supply or demand.

In addition, a true “costs vs. benefits” analysis should take into account “the costs of doing nothing.” These costs are largely ignored in the analysis of the Report. In an already highly degraded ecosystem (which all too many Columbia basin watersheds are now suffering from), there is an often very large social cost of maintaining the degraded *status quo*. That negative social cost is a net drag on the economy that could include economic costs that are monetizable as well, including at least: (a) greatly depleted (even ESA-listed) salmon runs, which then under weak stock management constraints can foreclose other major ocean salmon harvest opportunities and drain coastal fishing-dependent communities’ jobs and incomes; (b) complete or partial fish passage blockages, such as the four Snake River dams, which have numerous cascading impacts; (c) perpetual and mounting costs (now estimated at well over \$12 billion, with no end in sight) that has been invested in failed mitigation measures in efforts to undo the damages done by the Lower Snake River dams; (d) warm water reservoirs behind the dams that not only encourage salmon predators, but also create additional water treatment costs to local municipal water providers who are required to filter out pollutants, reduce water temperatures, and treat water for additional warm-water pathogens; (e) lost recreational activities because of health-code restrictions on recreational use of polluted water bodies (including closures caused by toxic algae blooms that are becoming much more common in warmer, slack-water reservoirs), thus reducing the recreation-based income of local affected communities; (f) loss of local property values triggered by poor water quality as well as the above impacts, and; (g) numerous monetary and infrastructure costs for hidden subsidies, such as costs of maintaining in-river barge traffic (maintaining locks, loss of water through the locks that could otherwise produce hydropower, channel dredging and the costs of maintaining the dams themselves.

These very real costs of the lower four Snake River dams and the poor water quality in the reservoirs behind them are often ignored or dismissed as “externalities,” but in any legitimate costs vs. benefits analysis this “cost of doing nothing” must be the baseline condition – and these so-called “externalities” can mount to very high social costs indeed.

That said, attached for reference are two well-respected Guidance Letters from numerous western-based professional resource Economists that contain principles of costs-benefits analysis they believe should apply to future salmon habitat and water quality protection efforts such as those proposed in the Report, as well as to all other western U.S. natural resource decisions. (See APPENDIX A)

### 3.0. The Value of Pacific Northwest Salmon

There are a multitude of good policy as well as ecosystem, economic and cultural reasons for the protection and restoration of the Pacific Northwest's dwindling salmon runs. Furthermore, since the Columbia River's salmon runs are highly migratory, the value they bring to society is disbursed over a wide region, from at least central California to southeast Alaska, where salmon harvests provide food, jobs and economic value to many people and support multiple food chains and ecosystems.

#### 3.1. Salmon Ecosystem Benefits

The once-great salmon runs of the Northwest never existed in an ecological vacuum, but were instead an integral part of an entire food-web that still supports many other species. Salmon are a major or important food source not just for humans, but for at least 138 species of birds, mammals, amphibians and reptiles native to the Pacific Northwest that have been identified by scientists as predators or scavengers of salmon at one or more stages of the salmon lifecycle. Of this group of 138 species, 9 species have a *strong-consistent* relationship with salmon, and another 58 have a *recurrent* relationship with salmon. Yet another 25 species have *indirect* relationships that depend upon healthy salmon runs to support their direct prey base.

As a recent survey of these salmon-driven ecological relationships notes:

“Salmon act as an ecological process vector, important in the transport of energy and nutrients between the ocean, estuaries, and freshwater environments..... As a seasonal resource, salmon directly affect the ecology of many aquatic and terrestrial consumers, and indirectly affect the entire food web.”<sup>4</sup>

Indeed, the return of salmon back to their natal watershed as adults is the one known mechanism for returning irreplaceable land-based nutrients, otherwise lost by erosion, back to the land. But as the region's salmon runs have collapsed, so has this important nutrient recycling mechanism. Recent calculations by Gresh, *et al.* indicate that only about 3 percent of the marine-derived biomass once delivered annually by anadromous salmon to the rivers of the Puget Sound, the

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<sup>4</sup> Species numbers and quote from introductory Abstract in Cederholm, C. J., D. H. Johnson, R. E. Bilby, L. G. Dominguez, A. M. Garrett, W. H. Graeber, E. L. Greda, M. D. Kunze, B. G. Marcot, J. F. Palmisano, R. W. Plotnikoff, W. G. Pearcy, C. A. Simenstad, and P. C. Trotter. 2000. *Pacific Salmon and Wildlife – Ecological Contexts, Relationship, and Implications for Management. Special Edition Technical Report*, Prepared for D. H. Johnson and T. A. O'Neil (Managing directors), Wildlife-Habitat Relationships in Oregon and Washington. WA Dept. of Fish & Wildlife, Olympia, WA. (Hereinafter “Pacific Salmon and Wildlife.”)

Washington coast, Columbia River, and the Oregon coast is currently still reaching those streams.<sup>5</sup> In other words, lack of returning salmon in recent decades is starving whole inland ecosystems, with unknown ultimate consequences.

Table 1: The nine wildlife species identified as having (or historically had) a strong, consistent relationship with salmon in Oregon and Washington. An “X” identifies the life stage(s) of salmon applicable to the species (from Appendix 1, *Pacific Salmon and Wildlife, supra*).

	Incubation	Freshwater Rearing	Saltwater	Spawning	Carcass	Comments
Common Merganser	X	X	X			
Harlequin Duck	X		X			Strong relationship w/drift eggs and alevin; indirect relationship with carcass-derived insects.
Osprey		X	X	X		
Bald Eagle			X	X	X	Strong relationship w/salmon; also indirect relationship – feeds on gulls, terns, and waterfowl that eat salmon; occasionally have been seen catching and consuming smolts.
Caspian Turn		X	X			
Black Bear				X	X	
Grizzly Bear				X	X	
Northern River Otter		X		X	X	
Killer Whale			X			

**3.1.1. The Plight of Southern Resident Killer Whales:** As just one current example of the intimate food-web dependency of many species on healthy Northwest salmon runs, consider the plight of the endangered Southern Resident killer whales (SRKW) (*Orcinus orca*). In 2005, due to their small population size and significant threats to their survival, NOAA Fisheries issued a final rule designating Southern Resident killer whales as endangered under the U.S. Endangered Species Act.<sup>6</sup> Scientific studies have shown that this whale population is food-limited, with declines in survival,<sup>7</sup> fecundity,<sup>8</sup> and social cohesion<sup>9</sup> during years with low Chinook salmon availability.

<sup>5</sup> Gresh, T. J., Lichatowich, and P. Schoonmaker. 2000. An estimation of historic and current levels of salmon production in the Northeast Pacific ecosystem: Evidence of a nutrient deficit in the freshwater systems of the Pacific Northwest. *Fisheries* 25(1):15-21.

<sup>6</sup> 70 *Fed. Reg.* 69,903 (November 18, 2005).

<sup>7</sup> Ford JKB, Ellis GM, Olesiuk PF, Balcomb KC III (2009) Linking killer whale survival and prey abundance: food limitation in the oceans’ apex predator. *Biol Lett* 6:139–142.

<sup>8</sup> Ward EJ, Holmes EE, Balcomb KC (2009) Quantifying the effects of prey abundance on killer whale reproduction. *J Appl Ecol* 46:632–640.

<sup>9</sup> Parsons KM, Balcomb KC III, Ford JKB, Durban JW (2009) The social dynamics of the southern resident killer whales and implications for the conservation of this endangered population. *Anim Behav* 77:963–971.

These orcas depend almost exclusively on salmon, with salmon comprising over 98 percent of their diet.<sup>10</sup> Of that, roughly 80 percent of their diet is Chinook salmon. A lack of prey, principally Chinook, is among the greatest threats to Southern Resident killer whale recovery and survival. The science shows they are feeding on salmon off the outer coast of Washington, Oregon, and California between January and June, and that these orcas concentrate near the mouth of the Columbia River at times that coincide with the return of spring Chinook.<sup>11</sup>

The 2008 NOAA Fisheries Southern Resident killer whale recovery plan states: “Perhaps the single greatest change in food availability for resident killer whales since the late 1800s has been the decline of salmon in the Columbia River basin.”<sup>12</sup> Salmon restoration efforts at a region-wide basis are necessary to help achieve Southern Resident killer whale recovery goals. Yet given the potential for substantial salmon recovery in the Columbia River basin, conservation efforts made there can contribute significantly to adequate and abundant prey for Southern Resident killer whales.

**3.1.2. Salmon and Healthy Forests:** Trees need salmon as much as salmon need trees. Throughout the Pacific Northwest and northern California, where soils are often nutrient-poor, the salmon lifecycle is an important driver of the forest nutrient cycle that supports forest health. Salmon are “anadromous” – this means they start their lives in freshwater lakes, streams and rivers, then migrate to saltwater where they spend, according to species, from two to seven years at sea before returning as adults to freshwater to spawn.

But when they return to spawn, salmon become a conveyor belt for nutrients from the ocean back to land. For example, an adult chum salmon returning to spawn contains an average of 130 grams of nitrogen, 20 grams of phosphorus and more than 20,000 kilojoules of energy in the form of protein and fat; a 250-meter reach of salmon stream in southeast Alaska receives more than 80 kilograms of nitrogen and 11 kilograms of phosphorous in the form of chum salmon tissue in just over one month.<sup>13</sup>

As the bodies of spawning salmon break down, nitrogen, phosphorus and other nutrients become available to streamside vegetation. According to Robert Naiman of the University of Washington, streamside vegetation gets just under 25 percent of its nitrogen from salmon. Other researchers report up to 70 percent of the nitrogen found in riparian zone foliage comes from salmon. One study concludes that trees on the banks of salmon-stocked rivers grow more than

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<sup>10</sup> Ford MJ, Hempelmann J, Hanson MB, Ayres KL, Baird RW, Emmons CK, et al. (2016) Estimation of a Killer Whale (*Orcinus orca*) Population’s Diet Using Sequencing Analysis of DNA from Feces. PLoS ONE 11(1): e0144956.doi:10.1371/journal.pone.0144956.

<sup>11</sup> Haneson MB, Emmons CK, Ward EJ (2013) Assessing the coastal occurrence of endangered killer whales using autonomous passive acoustic recorders. J. Acoustic Soc. Am. 134(5) 3486-3495.

<sup>12</sup> National Marine Fisheries Service (2008) Recovery Plan for Southern Resident Killer Whales (*Orcinus orca*). National Marine Fisheries Service, Northwest Region, Seattle, Washington. At: II-82.

<sup>13</sup> For a summary of these studies, see Mathew D. Kirckhoff, Effects of salmon-derived nitrogen on riparian forest growth and implications for stream productivity, *Ecology* (Dec. 2003), available at: <https://doi.org/10.1890/02-3121>.



three times faster than their counterparts along salmon-free rivers and, growing side by side with salmon, Sitka spruce take 86 years, rather the usual 300 years, to reach 50 cm thick.<sup>14</sup>

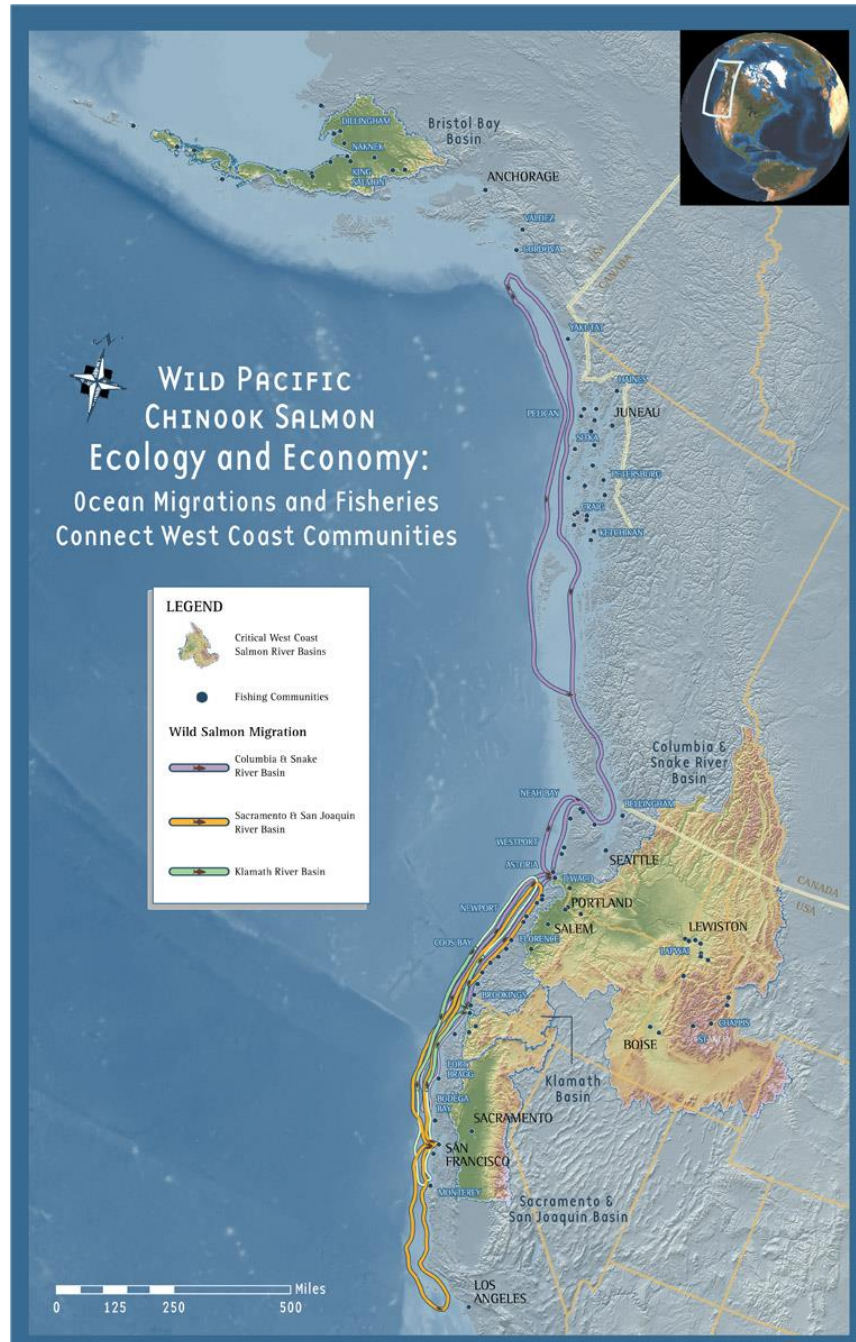
**3.1.3. Salmon and Healthy Estuaries:** Salmon occupy the estuaries of the Pacific Northwest in two life-stages: (1) as very small out-going juvenile smolts that are adapting to ocean life in brackish salt water marshes and estuaries as a transition state to ocean migrations, and; (2) as returning, in-migrating adults. In the first stage they are important prey species for many other types of fish, but in the adult stage they are both predator as well as important prey to marine mammals such as sea-lions and orcas, and to much larger fish. In both roles they are an important contributor to the ecological health of the region's estuaries, as well as linked to the overall health of these estuaries as critical habitat.

The Columbia River estuary ecosystem contains more life per square inch than the richest farmland and provides for multiple species of wildlife. The greater number of distinct habitats within an ecosystem, the more species it supports, the more ecological processes and functions it provides, and the better it withstands disturbances. Unfortunately, its historically wide range of complex, diverse habitats is now greatly diminished in the lower Columbia estuary. In the last 100 years more than 114,000 acres of lower Columbia River estuary floodplain have been converted to agricultural, urban, or other uses – a habitat loss in excess of 50%. Loss of critical estuary habitat has also been a factor driving regional salmon declines. Therefore, restoration of critical estuarine habitat for salmon should also be a part of any comprehensive salmon restoration strategy.

**3.1.4. Salmon as Highly Migratory Ocean Species:** Most Columbia-origin salmon species are highly migratory, and once they reach the ocean they can travel literally thousands of miles both north and south as they search for food and grow to maturity, with established coastal-shelf migration routes down the west coast to as far south as San Diego, and far north well into southeast Alaska, with many of these routes overlapping. These typical ocean migration routes are diagrammatically show in Chart 1 below.

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<sup>14</sup> Helfield, James M., "Effects of Salmon-Derived Nitrogen on Riparian Forest Growth and Implications for Stream Productivity"(2001). *Environmental Sciences Faculty Publications*. 19. [https://cedar.wvu.edu/esci\\_facpubs/19](https://cedar.wvu.edu/esci_facpubs/19); Reimchen, T., *et al.* 2003. Isotopic evidence for enrichment of salmon-derived nutrients in vegetation, soil and insects in riparian zones in coastal British Columbia. *American Fisheries Society Symposium* 34:59–69.



**Chart 1: Ocean migration routes of the major west coast salmon runs.**

Columbia Basin-origin salmon thus constitute a significant portion of ocean harvests in all these areas. More important, these widely migrating salmon become a major component of the entire west coast ocean ecosystem, in the roles of both predator and prey, during their whole life stage in the oceans. Their value in supporting and contributing to abundant ocean ecosystems and food webs is of incalculable (but clearly large) value to those ocean biological systems.

## 3.2. Salmonid Specific Economic/Monetary Benefits

Commercial, recreational and Tribal subsistence fisheries support many communities and economies in the Pacific Northwest, including (as examples) the following:

**3.2.1. Ocean Commercial Fisheries:** Commercial fishing generates or supports thousands of jobs in smaller coastal communities that lack the diversity of economic opportunity present in major urban areas.<sup>15</sup> For example, in 2015, the Washington coast town of Westport had under 2,000 residents and over 600 were employed in commercial fishing activities.<sup>16</sup> In 2016, commercial salmon landings in Washington State were about 15.8 million pounds, valued at more than \$26 million at *ex-vessel* (point of landing) wholesale prices.<sup>17</sup> Alaska's fishing families also depend on Washington's salmon because so many of the salmon caught off the coast of Southeast Alaska (roughly 50%) are from Washington via the Columbia River system.<sup>18</sup> In 2016, commercial salmon landings in Alaska were 542.6 million pounds, valued at \$380.5 million.<sup>19</sup>

From boat builders to seafood processors, commercial salmon fishing generates many additional jobs in the Pacific Northwest and Alaska. In 2015, Washington's commercial fishing and seafood processing sector employed 15,900 workers and generated \$9.4 million in revenue.<sup>20</sup> And in 2013, the Alaska seafood industry created 23,900 jobs and \$1.34 billion in labor income in the Puget Sound region, including jobs directly attributable to commercial fishing (active permit owners and crew members who travel to Alaska to fish) and Washington-based processing of Alaska-caught seafood.<sup>21</sup> Between 2012 and 2015, an average of 5,380 full-time equivalent jobs in Alaska and 3,090 full-time equivalent jobs in Washington were attributable to the commercial

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<sup>15</sup> Community Attributes Inc., *Washington State Maritime Sector Economic Impact Study* at 37-40 (2017), [https://www.maritimefederation.com/uploads/2/9/9/6/29962189/cai.wmf.maritime\\_cluster\\_study\\_2017\\_update.2017\\_0413.pdf](https://www.maritimefederation.com/uploads/2/9/9/6/29962189/cai.wmf.maritime_cluster_study_2017_update.2017_0413.pdf). See also Wash. Dep't of Fish and Wildlife, *Final Report: Economic Analysis of the Non-Treaty Commercial and Recreational Fisheries in Washington State* at 12 (2008 & Supp. 2012), [https://wdfw.wa.gov/publications/00464/wdfw\\_00464.pdf](https://wdfw.wa.gov/publications/00464/wdfw_00464.pdf) [hereinafter *Final Report*]; Gordon Gislason & Gunnar Knapp, *Economic Impacts of Pacific Salmon Fisheries*, Pacific Salmon Comm'n, at 27 (2017), available for download at <http://www.psc.org/download/333/special-reports/9337/economic-impacts-of-pacific-salmon-fisheries.pdf>.

<sup>16</sup> Community Attributes Inc., *supra* n.6, at 40.

<sup>17</sup> Nat'l Marine Fisheries Serv., *Fisheries of the United States* at xxiii (2016), available for download at <https://www.fisheries.noaa.gov/resource/document/fisheries-united-states-2016-report>. See also Gislason & Knapp, *supra* n.6, at 12 (showing 2015 harvests with *ex-vessel* value of over \$27.5 million for Washington).

<sup>18</sup> See William D. Templin & Lisa W. Seeb, *Clues to Chinook Salmon Nearshore Migration in Southeast Alaska from Estimates of Stock Composition in Troll Harvests*, Alaska Dep't of Fish and Game, [https://www.adfg.alaska.gov/static/fishing/PDFs/research/chinook\\_migration\\_poster.pdf](https://www.adfg.alaska.gov/static/fishing/PDFs/research/chinook_migration_poster.pdf). (showing the origins of chinook salmon caught in the commercial troll fishery in the nearshore waters of Southeast Alaska).

<sup>19</sup> Nat'l Marine Fisheries Serv., *supra* n.8, at xxiii (values at *ex-vessel* wholesale prices). See also Gislason & Knapp, *supra* n.6, at 12 (showing 2015 harvests with *ex-vessel* value of over \$111 million for Southeast Alaska).

<sup>20</sup> Community Attributes Inc., *supra* n.6, at ii.

<sup>21</sup> See Seattle Metropolitan Chamber of Commerce, *Ties That Bind: The Enduring Economic Impact of Alaska on the Puget Sound Region* 18-22 (2015), <https://www.seattlechamber.com/docs/default-source/Events-and-Programs-Documents/ties-that-bind-report-feb-2015.pdf?sfvrsn=2>.

salmon fishing industry alone.<sup>22</sup> Like the commercial fishing jobs, many of the additional jobs generated by the salmon fishing industry are located in smaller coastal communities whose economies are heavily dependent on the fishery.<sup>23</sup>

When Columbia River-origin juvenile salmon hit the ocean, many of them also swim and grow to adults well south from the Columbia River estuary, when they can later be harvested in Oregon's and northern California's ocean commercial and recreational fisheries. According to the Oregon Department of Fish & Wildlife, even greatly reduced in size as they have been in recent years, Oregon's ocean coastal commercial salmon fisheries still generated an average over the years 2010-2017 of 396,728 landed pounds of salmon in its multiple coastal ports, representing an ex-vessel (i.e., essentially at the wholesale price at the boat-processor delivery point) of an average of \$2,073,481 – which would have created, because of typical economic multipliers, more than \$5,000,000 in net economic impacts to mostly poor Oregon coastal communities through the chain of commerce.<sup>24</sup>

Oregon coastal salmon landings during 2019, however, were improved over seriously depressed immediately prior year averages: 985,000 landed pounds, valued at (ex-vessel prices) \$4.1 million – an increase of 34,000 pounds (4%) but a decrease of \$1.5 million (27%) in ex-vessel value compared with landings for 2018. In that same year, Washington's salmon landings (to which Oregon-origin salmon, primarily via the Columbia River can contribute) were 7.2 million pounds valued at \$13.1 million ex-vessel prices.<sup>25</sup> But both of these 2019 harvests were still far below what was landed in earlier decades, reflecting overall declines of salmon runs coastwide, which in turn were the result of decades of deteriorating inland river habitat. Serious water quality problems created by the many dams in the Columbia River basin also contributed to these declines in that and prior years.

**3.2.2. Ocean and Inland Recreational Fisheries:** Recreational fishing is also a major economic driver in the Pacific Northwest, especially in smaller communities. In Washington in 2006, for instance, 142,000 anglers fished recreationally for salmon and another 113,000 fished for steelhead.<sup>26</sup>

From fishing guides to small bait-and tackle store owners, from drift boat dealers to local hotel proprietors, from authors of fishing guides to local restaurants, from charter boat operators to outfitters, the annual economic ripple effect from these hundreds of thousands of anglers is huge. A 2010 report concluded that Washington's annual economic activity from sport fishing generates

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<sup>22</sup> See Gislason & Knapp, *supra* n.6, at iv, 14.

<sup>23</sup> See *Final Report*, *supra* n.6, at 12 (These jobs are “important at the community level along the Washington Coast, the Strait of Juan de Fuca, and the Puget Sound areas.”).

<sup>24</sup> See ODFW publication (Sept. 2019): [https://www.dfw.state.or.us/MRP/docs/Backgrounder\\_Comm\\_Fishing.pdf](https://www.dfw.state.or.us/MRP/docs/Backgrounder_Comm_Fishing.pdf).

<sup>25</sup> National Marine Fisheries Service (NMFS), *Fisheries of the United States (FUS 2019)* at xxii and xxiii (2019), available for download at <https://www.fisheries.noaa.gov/resource/document/fisheries-united-states-2019>.

<sup>26</sup> *Id.* at 18.

\$1.1 billion in economic activity and 14,655 associated jobs.<sup>27</sup> On average between 2012 and 2015, recreational salmon fishing and associated industries contributed 3,160 full-time equivalent jobs in Washington and 1,220 full-time equivalent jobs in Alaska.<sup>28</sup> During those same years, the average total economic impact of the recreational salmon fishing industry was \$394 million in Washington and \$153 million in Alaska.<sup>29</sup>

Though we have focused primarily on Washington and Alaska in the examples above, similar salmon economic benefits occur in Oregon and Idaho. A “snapshot” economic study of the entire Pacific Northwest for the year 1988 showed Oregon’s commercial salmon fisheries in 1988 generated \$89 million, supporting 4,450 family-wage jobs, while its recreational salmon fishery generated \$186 million, supporting 9,500 family-wage jobs. Idaho has no commercial salmon fishery, but recreational salmon fishing that same year in Idaho generated nearly \$93 million in income, supporting 4,750 family-wage jobs.<sup>30</sup> Even though most of the juvenile salmon emerging from the Columbia estuary would normally migrate northward where they contribute heavily to Washington, British Columbia and southeast Alaska ocean fisheries, Columbia River-origin salmon runs are still so large that they also contribute significantly to ocean salmon fisheries throughout the Oregon and even well south to northern California ocean salmon fisheries.

**3.2.3. Tribal and Subsistence Fisheries:** We do not speak for the Tribes, but there are multiple Tribal Nations throughout the Pacific Northwest, including in Washington and Oregon, to whom the U.S. owes Treaty obligations to provide for the protection of their native river systems and the salmon runs that use those systems.

The value of the Tribal salmon fisheries to their people and their Tribal economy, both subsistence fisheries and small commercial fisheries, cannot be easily quantified but is clearly enormous in terms of support for Tribal cultures and providing these sovereign First Nations and their communities a secure economic future. Some of those cultural values, in the Tribes’ own words, are identified below.

## 4.0. Salmon Cultural Values

Writer Tim Egan once defined the Pacific Northwest as “Wherever salmon can get to.” In fact, salmon are a major cultural icon for the entire region, and are woven into the lives and cultures of many communities throughout the Columbia River Basin. Coastal fishing-dependent communities celebrate the return of the salmon every year, and hundreds of inland communities and businesses

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<sup>27</sup> Wash. Dep’t of Fish and Wildlife, *Fish, Wildlife and Washington’s Economy* at 1 (2010), [https://wdfw.wa.gov/publications/01145/wdfw\\_01145.pdf](https://wdfw.wa.gov/publications/01145/wdfw_01145.pdf).

<sup>28</sup> Gislason & Knapp, *supra* n.6, at v.

<sup>29</sup> *Id.* at 18-23.

<sup>30</sup> The Economic Imperative of Protecting Riverine Habitat in the Pacific Northwest, Pacific Rivers Council (January, 1992) Publication No. 5 (1992).



depend upon recreational salmon fishing as a regular part of their incomes and annual family recreation.

But nowhere is the connection between salmon and culture more direct than within the various Native American communities widely distributed throughout the Pacific Northwest. Restoring the salmon runs these Tribes depend upon for both their subsistence and fish marketing economies, their cultures and their futures as Tribal people is a legal as well as high moral obligation. In the words of these sovereign Tribal governments whose lands span the Columbia basin, from the recent Columbia Basin Partnership's 100-year salmon and steelhead restoration plan, *A Vision for Salmon and Steelhead*, the Columbia River Treaty Tribes particularly remind us:

“The Columbia River Treaty Tribes are still here and are still committed to the same ancient covenant with salmon. We will continue to speak for those that cannot. Columbia River Treaty Tribes have been fighting for the rights and perpetuation of Columbia River salmon since 1855 and will always hold the government, and those that settled here, accountable to the intent of the treaties that were signed.... The treaty tribal baseline for tribal salmon restoration and harvest remains 1855. This entitlement is a fair share of the salmon harvest from all streams in their ceded areas – measured at the fully functioning product levels observed in the mid-1800s. This was the tribal entitlement at the time of treaty signing. It is still so today, and into the future.”

And as to looking at the “costs” of salmon protections, the Columbia River Treaty Tribes also have this to remind us of:

“Over the last 200 years, tribal resource losses, including reduced availability of salmon and steelhead, are a direct consequence of the resource gains of others in the Columbia Basin. It is a false equivalency to propose that all parties on this Task Force should be willing to give up equally, because historical gain/loss balances weight heavily against tribes.....”

“Rather than debating how many salmon we need to meet everyone’s needs, we should also ask how many apples the river reasonably needs to produce. How many potatoes do we need? How many cows do we need? And to what cost are we willing, as a society, to pay in the currency of salmon for the various economies the region now supports? To date, most can only demonstrate their anxiety by the money they will lose and how it will hurt them, you, or me right now. Few have talked about their own ability for adaptation and change.”<sup>31</sup>

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<sup>31</sup> Quotes from Tribal Statement in *A Vision for Salmon and Steelhead, Phase 2 Report of the Columbia Basin Partnership Task Force*, supra., pages 110 & 114-115.

## 5.0. Declining Salmon Runs Threaten Entire Communities

Even though greatly diminished from historic baselines, Columbia-origin salmon runs still contribute greatly to the Pacific Northwest's economy, but for decades salmon have been disappearing from the Pacific Northwest at alarming rates. Once too numerous to count, these fish today persist at only a small fraction of their historic abundance.

The collapse of what were once the world's largest runs of salmon has led the National Marine Fisheries Service (NMFS) to protect 28 different West Coast salmon and steelhead populations as either threatened or endangered under the federal Endangered Species Act. Many other populations are already extinct. The blocking and degradation of available salmon habitat has been a major factor in this decline and these extinctions.

Salmon are in trouble, and so are the fishing families who depend upon them. When fewer salmon return from the ocean to Washington's rivers, this translates directly to lower catch limits, shorter seasons, and a reduced ability for commercial fishing families to earn a living. Salmon harvests fluctuate from year to year, but the overall trend has been one of sharp decline.

Chinook (king) salmon and coho salmon are the most commercially valuable of western Washington's salmon species,<sup>32</sup> but these are the species that have seen some of the steepest declines.<sup>33</sup> From 1950 to 1955 in Washington, commercial landings of Chinook salmon averaged 10,248,683 pounds and coho averaged 11,779,067 pounds, but from 2011 to 2016, chinook landings averaged only 5,866,870 pounds, a reduction of about 43%, and coho landings averaged only 3,102,894 pounds, a reduction of about 74%.<sup>34</sup>

Washington's salmon sport fisheries have also been declining for decades.<sup>31</sup> From 1971 to 1974, the annual sport salmon catch in Washington averaged 1,224,881 salmon, but from 2010 to 2015, it dropped to an average of only 783,185 salmon, a reduction of about 36%.<sup>32</sup> As with the commercial fisheries, the more valuable fisheries have seen the steepest declines. Excluding pink salmon (a numerous but less valuable species<sup>35</sup>), the sport catch in Washington dropped during

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<sup>32</sup> See Gislason & Knapp, *supra* n.6, at 12 Exh. 2 (compare weight landed with *ex-vessel* value).

<sup>33</sup> See Wash. State Recreation and Conservation Office, Governor's Salmon Recovery Office, *State of Salmon in Watershed 2016* at 2 (showing declining trend in non-tribal chinook and coho harvests from the 1970s through 2015), <https://stateofsalmon.wa.gov/governors-report-2016/>.

<sup>34</sup> Nat'l Marine Fisheries Serv., Annual Commercial Landing Statistics (searchable by state, species, and year), <https://www.st.nmfs.noaa.gov/commercial-fisheries/commercial-landings/annual-landings/index>.

<sup>35</sup> See Wash. Dep't of Fish and Wildlife, Species Info, <https://wdfw.wa.gov/fishing/washington/Species/9009/> (pink salmon runs only occur in Washington in odd-numbered years); Kraig & Scalini, *supra* n.31, at 3 (nearly 40% of the total recreational salmon catch in Washington in 2015 were pink salmon); Gislason & Knapp, *supra* n.6, at 12 Exh. 2 (compare weight landed with *ex-vessel* value).

2010 to 2015 to an average of only 539,584 salmon, a decline of 56% from the 1971 to 1974 average.<sup>36</sup>

The good news is that much of what has been lost over the past decades in salmon economic contributions could be recaptured through appropriate salmon habitat restoration investments. One estimate is that restored salmon fisheries in the Columbia Basin could generate up to \$500 million/year in regional personal income and support up to 25,000 family wage jobs.<sup>37</sup> Learning to make those investments wisely and efficiently is one of the underlying themes of this Task Force. And these are “investments,” not costs – the return on these salmon restoration investments, if done correctly, will bring great economic and societal benefits in perpetuity.

## 6.0. Thinking Clearly About Removing Dams

**6.1. The Role of Columbia Basin Dams:** With more than 400 dams<sup>38</sup> in the Columbia River Basin, more than half of them dedicated (fully or partly) to generating hydropower, the region’s primary source of electricity, fish passage at dams has been a major concern for nearly as long as dams have been built in the basin. Only 31 federal hydropower dams comprise the Federal Columbia River Power System (FCRPS). The FCRPS dams’ operations are also coordinated with three major power dams on the Canadian side of the border through the U.S.-Canada Columbia River Treaty.

There is hardly anything more controversial in the Columbia Basin than discussing the fate of various dams. What is often missing in these debates, however, is a clear pathway for organizing such discussions in a rational way. It was not the Columbia Basin Partnership’s mission to weight the merits of any particular dam, nor did it do so. But as a contribution to reasoned discourse on this subject, and in view of the 100-year restoration time frame the Columbia Basin Partnership methodology requires, here are some of the assumptions that we believe should be incorporated in any such future discussions:

**6.2. Dams are Merely Human Constructions:** Many of us have grown up with Columbia River dams already in place, and so we often take them for granted, forgetting that every dam ever built was built by humans and designed in its time by engineers to provide specific social benefits and only for a specific engineered lifespan, not forever. It is therefore a human societal choice whether to build, repair, reconfigure or remove dams. The issues and debates over the fates of dams are therefore ones of policy, not of engineering capability.

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<sup>36</sup> See Kraig & Scalini, *supra* n.31, at 14 tbl. 4 (average of total sport catch in even numbered years – 2010, 2012, and 2014 – is 539,584).

<sup>37</sup> The Cost of Doing Nothing: The Economic Burden of Salmon Declines in the Columbia River Basin, Institute for Fisheries Resources (Oct. 1996), available at: <http://pcffa.org/wp-content/uploads/2016/10/CDNReport-Columbia.pdf>. Those numbers are in 1996 dollars and so would be greater today.

<sup>38</sup> This is an estimate from the NW Power Planning Council. However, no universally agreed up census of dams in the Columbia Basin seems to exist.



**6.3. Dams Are Designed to Provide for Certain Benefits vs. Certain Impacts:** In general, dams are engineered and built to provide some combination of the following benefits to society:

- Hydropower production
- River transportation
- Agricultural or urban water diversions
- Flood control

In return for these social benefits, yesterday’s policy decision-makers (i.e., those who made the original decisions to build any particular dam) chose to accept various negative impacts on society that can also be caused by dams, such as: partial or complete blockage of salmon migration routes; adverse water quality and quantity impacts; loss of natural river functions such as sediment recruitment and seasonal flushing flows that support healthy riverine ecosystems; channeling of rivers that reduce the natural meander of rivers over time; reduced river ecosystem functions generally.

These were clearly policy decisions, albeit hopefully based on the best available science at the time. But it must be remembered that in return for the benefits of any dam there have always been negative impacts and tradeoffs.

**6.4. No Dam Lasts Forever:** Being human-designed and built objects, each dam has an engineered lifespan. Beyond that lifespan, there is increased risk of catastrophic dam failure as well as loss of function generally (e.g., reduce storage capacity from sediment infills).

Currently, there are more than 91,000 dams in the U.S., and according to the National Inventory of Dams maintained by the U.S. Army Corps of Engineers, with some 15,600 of them classed as “high-hazard structures” as of 2019. The average life expectancy of a dam is about 50 years, again according to the U.S. Army Corps of Engineers, with 25% of the dams in the Army Corps of Engineers National Inventory of Dams now more than 50 years old. This number is increased to 70% by the year 20205.<sup>39</sup> A number of these aging dams are in the Columbia Basin.

**6.5. Over the Next 100 Years, Most Dams in the Columbia Basin Will Need to be Upgraded, Replaced or Removed:** The vision and planning horizon for salmon restoration in the Columbia Basin as outlined in the Columbia Basin Partnership report is for the next 100 years. During that 100-year time frame, all of the FERC-licensed hydropower dams in the

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<sup>39</sup> Maclin E, Sicchio M (1999, 16). Dam removal success stories: Restoring rivers through selective removal of dams that don’t make sense. American Rivers, Friends of the Earth, & Trout Unlimited, December 1999. [http://www.michigan.gov/documents/dnr/damsuccess\\_513764\\_7.pdf](http://www.michigan.gov/documents/dnr/damsuccess_513764_7.pdf). See also Army Corps of Engineers National Inventory of Dams (NID) [http://nid.usace.army.mil/cm\\_apex/f?p=838:1:0::NO::APP\\_ORGANIZATION\\_TYPE,P12\\_ORGANIZATION:2](http://nid.usace.army.mil/cm_apex/f?p=838:1:0::NO::APP_ORGANIZATION_TYPE,P12_ORGANIZATION:2)

Columbia Basin will be up for license renewal at least twice (FERC licenses are generally for no more than 50 years), a number of other non-hydropower dams will be silted up or become otherwise dysfunctional, many will become safety hazards, many more will have to be upgraded or face escalating maintenance costs, and a large number of them will have exceeded their designed lifetimes.

As to the Federal dams of the FCRPS (which require no FERC licenses), between 12 and 25 federal Administrations will have come and gone during that 100-year time frame. The U.S. – Canada Columbia River Treaty will also have to be renegotiated several more times. And most of these federal dams will have reached or surpassed their engineered lifespans, after which they become serious public dam failure hazards.

In short, there will be many opportunities over the next 100 years for reviewing the roles, benefits, impacts and potential futures of each dam in the Columbia Basin. The four dams in the Lower Snake River as simply part of that inevitable process.

**6.6. The Value Placed on Social Benefits (or Impacts) Created by Dams Often Changes Over Time:** As society (and technology) continues to change, the purposes that any particular dam may serve, and the value that society places on a dam's particular mix of benefits vs. impacts, will likely change over time. The state of the science and our knowledge of these tradeoffs will also change and grow. Today's and tomorrow's dam policy makers will need to respond to those changes.

As an example, when the first federal dams were built in the Columbia Basin in the 1930's, they were the only viable sources of electrical power for their local power-hungry new cities. Today, however, we have multiple sources of non-hydro electrical power, including nuclear, natural gas and coal power plants, but also practical and low-cost carbon-free renewable sources such as wind, solar and geothermal power, all available today through a complex, multi-state power grid that is no longer dependent upon any particular generation facility, but which combines and coordinates them all. Many of those changes were not foreseen in the 1930's.

Society today also places a higher value on protecting and preserving the Pacific Northwest's salmon runs and watersheds than in the past. Northwest salmon are now the basis for a major west coast food industry, supplying valuable salmon to major fishing-based communities from SE Alaska to central California, as well as for export. The role that salmon play in the overall health of Pacific Northwest ecosystems, and the value that brings to society, is also much better understood and appreciated than in the past.

Economists have also become more sophisticated in how they do public policy cost vs. benefits analysis when comparing the benefits vs. deficits of dam construction proposals. It is very important, Economists tell us, to objectively assess all sides of the costs-benefits equation, including the costs as well as benefits of the baseline *status quo*, and not just the costs of the

proposed change absent its benefits or vice versa. Every proposed change, they tell us, has both plusses and minuses, and all must be considered in any legitimate costs-benefits analysis (see Appendix A – Economists’ guidance letters on doing costs vs. benefits analysis on salmon restoration).

**6.7. Finding Ways to Replace Benefits of Dams with Lesser Impacts Will Reduce the “Frictional Costs” of Change:** During the era of dam-building in the Columbia Basin, many communities have grown up around the dams, and many stakeholder groups have become dependent on the benefits they provide. Change, even once the need is clearly recognized, may be difficult for those communities.

But change does not have to be a zero-sum game, with winners winning only at the expense of losers. There have been and are many deals with “sweet spots” in which all sides may benefit at least in proportion to what they must give up. Finding these “win-win” scenarios creates stable agreements and helps greatly to facilitate the desired change. To do this, Economists say, one must consider and carefully analyze – and if possible, reduce -- the “frictional costs” of the proposed change.

“Frictional costs” are the costs to all parties of getting from where they are now (the *status quo*) to the desired future outcome (the vision). The magnitude of “frictional costs” of change will determine the speed of that change and may also determine its outcome, including whether it can be achieved at all. Reduce those frictional costs and the proposed change will be easier, i.e., will have much less negative impact on stakeholders, and thus garner broader political support. Fairly compensating stakeholders in some way for any lost benefits they may suffer from changes in the dams thus make excellent policy as well as economic sense.

**6.8. When Dam Removal Makes the Most Sense:** In general, dam removal makes the most sense (or becomes the dominant option) for one or more of three major reasons:

- When a project no longer provides the benefits it was designed to produce, or alternatively when the value of the environmental benefits of removal become proportionally greater than the value of keeping the project intact.
- For safety reasons. As noted above, some 15,600 U.S. dams have now been classed as “high-hazard structures” by the U.S. Army Corps of Engineers. The American Society of Civil Engineers estimated in 2021 that total dam repair costs across the U.S. amounted to \$115 billion. All dams can eventually become safety hazards if they exceed their designed lifetime.
- For economic reasons. This is especially the case when a project is no longer cost-effective in that it will cost more to retrofit and relicense than the value of the benefits it would then provide.

Among the more than 400 dams in the Columbia Basin, there are likely several candidates for removal, particularly among older dams that have exceeded or soon will exceed their engineered lifespans, no longer produce the benefits they were designed to provide, and which block important salmon runs. In many cases, it would simply cost more to retrofit and relicense those dams than the value of the remaining benefits such a project would provide. In such instances, when the costs of retrofitting and relicensing exceeds the value of the benefits such a dam could provide, this makes them economically obsolete and thus good candidates for selective removal.

On the other hand, there are many other dams which could continue to produce major social benefits, but which could be re-engineered or modified to have less impact on salmon runs and other ecosystem values (e.g., through better fish passage). These are candidates for “win-win” solutions for retention with modifications to facilitate salmon passage or minimize passage mortalities. The technology for safe fish passage continues to advance.

And in still other cases, building new dams – particularly off-stream water storage dams, given likely future impacts of climate change – may also make sense. An objective and thorough analysis of all the benefits and all the deficits of any proposal should drive these kinds of debates.

Each dam has its own unique mix of historical reasons to exist, costs and benefits, pluses and minuses. It is therefore important that we remember that each dam project must be objectively considered, and any potential future changes discussed, on a case-by-case basis and with an open mind. It is hoped that the analytical process outlined above will aid in that policy process.

Information on the more than 1,403 dams that have been removed from rivers in the United States over the past century (as of 2017) is now available to the public, compiled by American Rivers:

<https://www.americanrivers.org/conservation-resource/american-rivers-dam-removal-database-now-available-public/>

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## APPENDIX A

### **Economists' Guidance Principles for Salmon Restoration Costs vs. Benefits Analysis**

When considering whether or not to go forward with any particular salmon habitat restoration proposal, one needs to look objectively at both all the social costs as well as all the social benefits of such an action. This is usually done at the agency decision-maker level through some type of “costs-benefits” analysis.

However, as a number of professional natural resource Economists have noted, while costs are important the social benefits of salmon habitat restoration proposals are often given short-shrift or ignored in most current, standard agency “costs-benefits” analyses. This initial bias greatly distorts the economic balance sheet and thus unfairly pre-biases public policy decision-making toward one end of the spectrum.

Economists tell us that we must account for the fact that salmon recovery will generate economic benefits as well as costs. To understand the net benefit (a net cost if negative) to the economy as a whole, one must consider the effects on the production of all goods and services. The effects on goods and services that are traded in markets, such as commercial salmon, timber production, and agricultural production, should receive the same consideration as those, such as recreational fishing, clean streams, and biodiversity (i.e., non-market values) that are not. Economists also tell us that a full accounting must be provided of the true value of each affected good or service, taking into account the market price, where appropriate, as well as all factors, such as subsidies, taxes, and environmental externalities, that may distort the level of supply or demand.

Attached for reference are two well-respected Guidance Letters from numerous western-based professional resource Economists that contain principles of costs-benefits analysis they believe should apply to future salmon habitat restoration efforts such as those proposed by this Task Force, as well as to all other western U.S. natural resource decisions.

#### References:

- A Letter from Economists to Governors of Oregon (Kitzhaber), California (Wilson), Washington (Loche) and Alaska (Knowles) and Premier of British Columbia (Clark). (Sept. 9, 1998) [77 signatures]
- A Letter from Economists to President Bush and the Governors of Eleven Western States Regarding the Economic Importance of the West's Natural Environment. (December 3, 2003) [95 signatures]

#####

09 September 1998

Governor John A. Kitzhaber  
State Capitol Building  
Salem, Oregon 97310

Governor Tony Knowles  
Office of the Governor  
P.O. Box 110001  
Juneau, Alaska 99811

Governor Gary Locke  
Office of the Governor  
P.O. Box 40002  
Olympia, Washington 98504-0002

Governor Pete Wilson  
State Capitol Building  
Sacramento, California 95814

Premier Glen Clark  
Office of the Premier  
Room 156, West Annex  
Parliament Buildings  
Victoria, BC V8V 1X4 Canada

Dear Governors Kitzhaber, Knowles, Locke, and Wilson, and Premier Clark:

Decisions regarding the management of Pacific salmon, many of which are experiencing deep declines in numbers, can affect a vast landscape along the western edge of North America and markedly influence the region's future economy. With this letter, we hope to help lay the foundation for the public debate over the economic aspects of these decisions.

Most of the discourse on the economic issues of salmon recovery has focused too narrowly, concentrating almost exclusively on the costs of recovery. Costs are indeed important, but they tell only part of the economic story. We encourage you and the members of your Administrations to adopt a broader perspective and consider the full range of economic consequences of salmon-management decisions. Toward this end, we recommend that you examine and weigh all these factors:

\* Costs, Benefits, and Net Benefits.

Salmon recovery will generate economic benefits as well as costs. To understand the net benefit (a net cost if negative) to the economy as a whole, one must consider the effects on the production of all goods and services. The effects on goods and services that are traded in markets, such as commercial salmon, timber production, and agricultural production, should receive the same consideration as those, such as recreational fishing, clean streams, and biodiversity, that are not. A full accounting must be provided of the true value of each affected good or service, taking into account the market price, where appropriate, as well as all factors, such as subsidies, taxes, and environmental externalities, that distort the level of supply or demand. Some of the benefits and costs will manifest themselves in the

immediate vicinity of the resources affected by salmon recovery, while others will manifest themselves at greater distances.

\* Jobs, Incomes, and Transitions.

Salmon recovery will have diverse impacts on labor markets, increasing some demands for labor and decreasing others. It also may affect the spatial distribution of the supply of labor by influencing the location decisions of some households. To understand the resulting impacts on jobs and incomes, one must consider the salmon-related changes in demand and supply against the backdrop of the markets' ability to adjust. One should examine both the overall change in jobs and incomes as well as the transitions for affected workers, their families, and their communities.

\* Distribution of Economic Consequences.

The positive and negative effects of salmon recovery will not be distributed equally. Identifying the winners and losers can create opportunities to explore options for breaking political gridlock—by clarifying mechanisms, for example, for the winners to provide some compensation to the losers.

\* Rights and Responsibilities.

Owners of natural resources affected by salmon-recovery measures have both rights regarding their use of these resources and responsibilities not to exercise these rights in ways that unreasonably restrict the rights of others. This is true of both private- and public-property owners. To understand the costs and benefits associated with salmon recovery, one first must have a clear understanding of the relevant rights and responsibilities, because society might assign very different values to two recovery actions that are otherwise identical but one restricts a property owner's rights and the other forces it to comply with its responsibilities.

\* Uncertainty and Sustainability.

Nobody can eliminate the uncertainty regarding how salmon-recovery decisions will affect salmon populations and the economy, and it is inevitable that some decisions will not yield the desired outcomes. Reversing undesired outcomes is always costly, however, some outcomes are less costly to reverse than others. Some, of course, are irreversible. To understand the full economic consequences of salmon-recovery decisions, one should consider the potential reversal costs if the decision should yield undesired outcomes.

\* Looking Beyond Salmon.

To understand the full consequences of salmon recovery, one must look beyond those tied to the salmon, themselves, and examine those linked to the productivity and use of the surrounding ecosystem. Changes in ecosystem productivity may occur through the restoration of the ecological functions of salmon-bearing streams and the surrounding watersheds that will accompany salmon recovery. Changes in the use of the resources of the larger ecosystem may have both positive and negative effects on the economy.

We hope you will consider the factors outlined here, and use this outline to improve the public's understanding of the full economic consequences of salmon recovery.

Sincerely,

W. Ed Whitelaw  
University of Oregon/ECONorthwest

Ernest Niemi  
ECONorthwest

And the following co-signing economists:

Russ Beaton, Willamette University  
Peter Berck, University of California Berkeley  
Bruce Blonigen, University of Oregon  
Peter Bohmer, Evergreen College  
Richard Brinkman, Portland State University  
Gardner Brown, University of Washington  
Walt Butcher, Washington State University  
Kevin Calandri, California State University Sacramento  
Arthur Caplan, Weber State University  
Ken Casavant, Washington State University  
Laura Connolly, Oregon State University  
Jeffrey Connor, Oregon State University  
Robert Curry, California State University Sacramento  
Elizabeth E. Davis, Oregon State University  
Robert Deacon, University of California Santa Barbara  
David Donaldson, University of British Columbia  
Bryan Ellickson, University of California Los Angeles  
Mark Evans, California State University Bakersfield  
Anthony Fisher, University of California Berkeley  
David E. Gallo, California State University Chico  
Alan Gin, University of San Diego  
Eban Goodstein, Lewis & Clark College  
Lawrence Goulder, Stanford University  
Theodore Groves, University of California San Diego  
A.R. Gutowsky, California State University Sacramento  
Steve Hackett, Humboldt State University  
Brent Haddad, University of California Santa Cruz  
Dan Hagen, Western Washington University  
Darwin C. Hall, California State University Long Beach  
Jane Hall, California State University Fullerton  
Robert Halvorsen, University of Washington  
Bill Harbaugh, University of Oregon  
Martin Hart-Landsberg, Lewis & Clark College  
Stephen E. Haynes, University of Oregon  
John F. Henry, California State University Sacramento  
Steve Henson, Western Washington University



Richard B. Howarth, Dartmouth  
Lovell S. Jarvis, University of California Davis  
Desmond Jolly, University of California Davis  
Mary King, Portland State University  
Van Kolpin, University of Oregon  
B. Y. Lee, University of Oregon  
Cathleen Leue, University of Oregon  
Peter Lund, California State University Sacramento  
Bruce Mann, University of Puget Sound  
Carlos Martins-Filho, Oregon State University  
Ray Mikesell, University of Oregon  
Andrew Narwold, University of San Diego  
Noelwah Netusil, Reed College  
Roger Noll, Stanford University  
Dale O'Bannon, Lewis & Clark College  
Arthur O'Sullivan, Oregon State University  
Steve Polasky, Oregon State University  
Thomas Potiowsky, Portland State University  
Tom Power, University of Montana  
R. Bruce Rettig, Oregon State University  
Alan Richards, University of California Santa Cruz  
Robert J. Rooney, California State University Long Beach  
Tony Rufolo, Portland State University  
Linda Shaffer, California State University Fresno  
Barry N. Siegel, University of Oregon  
Emilson Silva, University of Oregon  
Ross Singleton, University of Puget Sound  
Chuck Skoro, Boise State University  
David Starrett, Stanford University  
Kate Stirling, University of Puget Sound  
Joe Story, Pacific University  
Rod Swanson, University of California Riverside  
Paul Thorsnes, Grand Valley State University, Michigan  
Victor Tremblay, Oregon State University  
Charles Vars, Oregon State University  
John F. Walker, Portland State University  
Norm Whittlesey, Washington State University  
Yung Yang, California State University  
Ross Youmans, Oregon State University  
Zenon X. Zygmunt, Western Oregon University

Note: Affiliations are for informational purposes and do not imply consent by organizations.

cc: David Anderson, Minister, Fisheries and Oceans, Canada  
Will Stelle, National Marine Fisheries Service

**December 3, 2003**

**A Letter from Economists to President Bush and the Governors of Eleven Western States Regarding the Economic Importance of the West's Natural Environment.**

To:

President George W. Bush  
The White House  
1600 Pennsylvania Avenue NW  
Washington, DC 20500

The Honorable Dave Freudenthal, Governor of Wyoming  
State Capitol Building  
Cheyenne, WY 82002-0010

The Honorable Kenny Guinn, Governor of Nevada  
State Capitol  
101 North Carson Street  
Carson City, NV 89701

The Honorable Dirk Kempthorne, Governor of Idaho  
700 West Jefferson, 2nd Floor  
P.O. Box 83720  
Boise, Idaho 83720-0034

The Honorable Ted Kulongoski, Governor of Oregon  
160 State Capitol  
900 Court Street  
Salem, Oregon 97301-4047

The Honorable Gary Locke, Governor of Washington  
PO Box 40002  
Olympia, WA 98504-0002

The Honorable Judy Martz, Governor of Montana  
P.O. Box 0801  
204 State Capitol  
Helena, MT 59620-0801

The Honorable Janet Napolitano, Governor of Arizona  
1700 West Washington  
Phoenix, AZ 85007

The Honorable Bill Owens, Governor of Colorado  
136 State Capitol  
Denver, CO 80203-1792

The Honorable Bill Richardson, Governor of New Mexico  
Office of the Governor  
Room 400, State Capitol Building  
Santa Fe, NM 87501

The Honorable Arnold Schwarzenegger, Governor of California  
State Capitol Building  
Sacramento, CA 95814

The Honorable Olene Walker, Governor of Utah  
210 State Capitol  
Salt Lake City, UT 84114

Dear Mr. President;  
Dear Governor Freudenthal;  
Dear Governor Guinn;  
Dear Governor Kempthorne;  
Dear Governor Kulongoski;  
Dear Governor Locke;  
Dear Governor Martz;  
Dear Governor Napolitano;  
Dear Governor Owens;  
Dear Governor Richardson;  
Dear Governor Schwarzenegger;  
Dear Governor Walker:

We are economists, and we are writing to express our concern about federal and state actions that harm the West's natural environment and, as a result, the economic outlook for this region's workers, families, firms, and communities.

The West's natural environment is, arguably, its greatest, long-run economic strength. The natural landscapes of the western states, with wide open spaces, outdoor recreational opportunities, and productive natural-resource systems underlie a quality of life that contributes to robust economic growth by attracting productive families, firms, and investments. The West's natural environment, however, faces serious challenges that threaten to undermine its contribution to the economy. These include air and water pollution, urban sprawl, the extension of roads and other development into roadless public lands, and fragmentation of habitat for native fish and wildlife.

The economic importance of the West's natural environment is widely recognized. Last year, for example, the Western Governors' Association, recognizing that "There is a lot at stake," reaffirmed its adoption of the Enlibra Principles for guiding policy and decision-making regarding natural resources and the environment.<sup>1</sup>

The seventh of these principles is, "Recognition of Benefits and Costs – Make Sure All Decisions Affecting Infrastructure, Development and Environment are Fully Informed."<sup>2</sup> We endorse this principle, and we commend each of you for your commitments to apply it to the actions of your administration. Despite your commitments, however, many state and federal actions are causing additional environmental degradation, increasing the risks of future degradation, or slowing efforts to reverse past degradation. These actions harm the economy—across the West and in each of the states. They diminish the economic well-being of many residents, divert natural resources from their highest and best use, reduce the

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<sup>1</sup> Western Governors' Association, "Principles for Environmental Management in the West." [http://www.westgov.org/wga/policy/02/enlibra\\_07.pdf](http://www.westgov.org/wga/policy/02/enlibra_07.pdf). p. 2.

<sup>2</sup> Ibid. p. 6.

environmental amenities that are essential ingredients of the West's quality of life, and pass to future generations the costs of cleaning up this generation's environmental messes.

We ask each of you to renew and strengthen your efforts to secure for the West both a healthy environment and a prosperous economy. Toward this end, we ask you to initiate a review of your administration's actions affecting the environment and the economy. This review should:

- Identify actions having a significant impact on the environment and fully describe the benefits and costs of each.
- Reinforce those actions that strengthen the economy by protecting or restoring environmental quality.
- Arrest those actions that damage the economy by degrading the environment.

In the remainder of this letter we describe the linkage between environmental quality and economic prosperity, identify some of the environmental policies and activities harmful to western economies, and express eight principles for capitalizing on the environment-economy linkage.

## **Environmental Quality Is a Major Source of the West's Long-Run, Economic Strength**

In the distant past, the West's natural resources were widely abundant and important to the economy primarily when they were converted into something else. We converted forests, mineral deposits, and streams into lumber, metals, and hydroelectricity; valleys, wetlands, and hillsides into agricultural and urban landscapes; and land, water and air into waste repositories.

Today, conditions have changed.

**Some important elements of the environment are scarcer.** The population and distribution of many native species have diminished markedly. Similarly, the supplies of roadless lands, free-flowing rivers, and unexploited marine areas have diminished and, although there have been some notable improvements recently, much of the West's air and water remains degraded.

**The structure of the western economy has changed.** Though still important, extractive industries (logging, mining, and commercial fishing) and agriculture now play a smaller economic role because their ability to generate new jobs and higher incomes has declined. Across most of the West, a community's ability to retain and attract workers and firms now drives its prosperity. But if a community's natural environment is degraded, it has greater difficulty retaining and attracting workers and firms.

**The economic costs of environmental degradation are rising.** As the West's population increases, so too do the damages (current and future) from exposure to hazardous pollution and the degradation of environmental amenities. As their habitats

shrink, many native species face an increased risk of extinction. Reversing this trend becomes more expensive over time. As ecosystems are degraded, they provide fewer economically valuable services, such as cleansing the water in streams, and communities therefore must provide replacement services with water-treatment plants and other costly investments.

**The economic benefits of protecting and restoring environmental quality are large and increasing.** As the West's population increases, the West enjoys greater economic benefits by avoiding exposure to hazardous pollution, maintaining scenic natural vistas, extending the availability of recreational opportunities in clean environments and on public lands, and sustaining the existence of undeveloped lands and healthy ecosystems.

**Misleading price signals slow economic growth.** Inefficient pricing of many natural resources encourages waste and diminishes economic productivity by allocating resources to low-value uses, while higher-value uses languish. Subsidies to irrigation, logging, public-land ranching, and mining prop up activities that would not take place under efficient, market conditions. Underpricing of urban roads, municipal-industrial water, and pollution emissions sends false signals regarding the true cost of urban sprawl, and the true value of free-flowing streams, and clean air and water.

**Climate change poses significant economic risks.** Global warming threatens to alter winter snow fall in the West's mountains, increasing the risk that runoff in important rivers will fall short of summer demands for water; raise sea levels, increase the risk of coastal flooding, change the distribution of habitats, and increase the risk of extinction for some threatened and endangered species.

As these and related changes evolve, the economic health of western communities increasingly will depend on the health of the environment. Long-run prosperity will derive from efficient, effective efforts to conserve increasingly scarce environmental resources, protect high-quality natural environments, reverse past environmental degradation, and manage congestion in both urban areas and on public lands with high recreational use. Resource-management policies and economic-development activities that significantly compromise the environment will likely do more economic harm than good.

### **Many Current Policies and Activities Degrade or Threaten the West's Environment and Jeopardize the West's Prosperity**

Numerous governmental policies and activities affecting the West's natural resources, which purportedly help the West's economies, are doing just the opposite. Here are a few examples:

**Inadequate investment in parks.** The federal government has failed to maintain the infrastructure and environmental quality of national parks. State and local governments have done the same with their own parks. These failures have weakened the West's economies by reducing the attractiveness of nearby communities to workers and firms and by eroding the foundation for the outdoor recreation and tourism industries.

**Reduced protection for roadless public lands.** By opening roadless lands to vehicular traffic, mining, logging, grazing, and other development, usually at a net cost to the US taxpayer, the federal government has expanded the supply of that which is already plentiful and common at the expense of that which is increasingly scarce and unique. Such actions fail to account for the benefits non-motorized visitors receive from these lands and for the loss of the considerable economic benefits—recreation, high-quality water, wildlife habitat, spiritual values, and more—that public lands provide when they are undeveloped. The loss of these benefits undermines one of the cornerstones of economic strength for communities throughout the West.

**Slow action to conserve threatened and endangered species.** Congress has failed to provide adequate funding, and federal agencies have dragged their feet when called upon to conserve threatened and endangered species. These actions jeopardize the economic outlook for western communities by increasing the risks to species with high economic value, protecting inefficient and often subsidized activities harmful to both the species and the economy, and raising the ultimate costs of conserving the species.

**Slow clean-up of polluted sites.** Federal agencies have not requested and Congress has not provided adequate funding to clean-up Superfund sites promptly. Some state and local governments have slowed the clean-up process. Delayed clean-up of these sites harms the economy by extending westerners' exposure to hazardous materials, diminishing the value of nearby properties, impeding economic-development activities near polluted sites, and giving polluters additional incentives to pollute in the future.

**Ineffective response to risks of global warming.** Current research results are sufficiently robust to conclude that global warming poses significant economic risks to the West, including increases in coastal flooding, more frequent severe storms, and reductions in snowpack resulting in lower summer flows of important rivers and streams. These risks are perpetuated and strengthened by the failure of Congress and the White House to take decisive action to curb emissions of carbon dioxide and other global greenhouse gases.

**Inefficient management of public forests.** Federal and state forest managers emphasize the production of logs, forage, minerals, and other commodities without fully accounting for adverse impacts on services, such as recreation, provision of clean water in streams, sequestration of carbon, and the existence of roadless lands. These actions reduce the overall value of goods and services derived from public forests.

**Lack of appropriate incentives for resource conservation.** With subsidies and inefficient pricing, federal, state, and local policies encourage waste and discourage conservation by hiding from consumers the full costs of resource-intensive activities, such as exploration for oil and gas, irrigation, public-land grazing, and congestion on urban roadways and at public-land recreation sites.

**Unreasonable exemptions from environmental review.** Federal resource managers have granted exemptions for military operations, logging, exploration for oil and gas, operation of motor vehicles on roadless public lands, the use of some pesticides, the emission of air pollution, and other activities. Also, de facto exemptions occur when federal and state agencies fail to enforce environmental laws. The economy is harmed when activities are allowed to proceed even though their economic costs outweigh their benefits.

**Unnecessarily divisive approaches to economic/environmental issues.** The costs—to individual workers, families, firms, communities, and the economy as a whole—of the changing relationship between the economy and the environment are worsened by federal, state, and local actions that promote misunderstanding and divisiveness rather than cooperative problem-solving. Especially divisive and costly are proposals and decisions that presume the economic benefits of an increase in an extractive, agricultural, or development activity necessarily exceed the costs, even when the evidence indicates otherwise. Recent examples include proposals or decisions to:

- Encourage road development, vehicular traffic, and other development on lands with roadless or wilderness qualities, including national parks, national forests, and lands administered by the Bureau of Land Management.
- Promote energy consumption rather than conservation.
- Relax restrictions on emissions of water and air pollution.
- Forgo U.S. leadership of efforts to shape a prompt, efficient and global response to climate-change risks.
- Relax restrictions on the use of or exposure to potentially harmful substances.

## **We Encourage You to Adopt Initiatives that Promote Both a Healthy Environment and a Healthy Economy**

We ask each of you to initiate a review of the economic effects of actions taken by your administration that have a significant impact on the environment. The primary objective of this review should be to identify and correct those actions that are harming the economy by degrading the environment. It also should highlight the merits of those actions beneficial to both the environment and the economy. We urge you to act promptly.

We also urge you to implement appropriate policies and procedures to increase the likelihood that future governmental actions will capitalize on and reinforce the evolving relationship between the West's environment and its economy. These initiatives should incorporate these eight principles:

- Principle #1: Environmental protection has economic benefits as well as economic costs. It has positive as well as negative impacts on jobs and incomes.
- Principle #2: Some economic interests in natural resources are mostly local but, increasingly, the interests are broader in geographic scope: regional, national, and even global.
- Principle #3: To discourage waste, prices for the use of environmental resources should reflect the full costs and benefits to the economy, exclusive of subsidies.
- Principle #4: Given their stewardship responsibilities regarding the environment, it is appropriate for governments to encourage or undertake activities that protect the environment and to discourage or prohibit those that do not. It is also appropriate for government to own and use land and water resources to



protect the environment and to support others who desire to own and use resources for the same purpose.

**Principle #5:** Governments should continually seek to improve the efficiency of their environmental- and resource-management programs without compromising their responsibilities. These programs may include a mixture of regulations, incentives, and public ownership of resources. They should aim to bring about as high a level of environmental quality as possible for a given expenditure.

**Principle #6:** To understand the full, potential economic consequences of a pending resource-management decision, one should consider the potential reversal costs if the decision should yield undesirable outcomes.

**Principle #7:** The benefits and costs of environmental protection and degradation fall unevenly on different groups. Anticipating and mitigating these effects can reduce the controversies over the West's environment and economy. Having the winners compensate the losers, for example, could serve this principle.

**Principle #8:** Owners of natural resources have both rights and responsibilities. Both private- and public-property owners have rights to use their properties in ways that do not unreasonably harm others or restrict their rights. Clarifying and respecting the rights of all parties—including future generations—affected by the uses of environmental resources remains a necessary condition for effective environmental management.

## **Conclusion**

**We are not saying** that resource-intensive industries (agriculture, timber, commercial fishing, and mining) do not play an important role in the West's economies. They are important today, and we expect they will remain important in the future.

**We are not saying** that the shift away from industries and activities harmful to the environment will not hurt some workers, families, and communities. It has in the past and it will in the future.

**We are not saying** that protecting and improving the environment can be accomplished without costs, nor are we saying that governmental entities should disregard such costs. To the contrary, we are calling for consideration of the full range of costs and benefits of policies, decisions, and activities that affect the western environment and, hence, its economy.

**We are not saying** that no progress is being made in capitalizing on the link between environmental health and economic prosperity. Many private-sector firms and public agencies have taken actions to reduce their negative impact on the environment and found that they saved money.

**Rather, we are saying** that nearly all communities in the West will find they cannot have a healthy economy without a healthy environment. Moreover, there exist many opportunities in the West to improve both the environment and the economy, for example, the elimination of inefficient subsidies would make more money available for other public services or to reduce debt. The longer these opportunities languish, the fewer will be the West's jobs, the lower its incomes, and the poorer its communities. Conversely, the sooner we seize these opportunities, the sooner the West will enjoy more jobs, higher incomes, and greater prosperity.

**We are saying** that the economic pressures to arrest and reverse environmental degradation will increase. Those who promise that workers, firms, and communities tied to environmentally harmful activities can avoid these pressures if only the environmental laws, such as the Endangered Species Act, were set aside raise false hopes. The pressures are independent of specific laws. Even if such laws are repealed, the costs of environmentally harmful activities will continue to rise and jeopardize the economic outlook for affected communities. Public officials can best promote long-run economic prosperity in the West by encouraging efficient transitions away from harmful activities toward those beneficial to both the environment and the economy.

**We are requesting** that you recognize the important role the environment plays in western economies and take the steps we've identified to strengthen these economies by protecting and enhancing the quality of the region's natural environment.

Sincerely and respectfully,

*The following individuals have endorsed the contents of this letter. Institutional references are provided for identification only.*

<b>State</b>	<b>Name, institutional affiliation</b>
<b>Arizona</b>	Bonnie G. Colby, The University of Arizona
	Dennis Cory, University of Arizona
	Ron Trosper, Northern Arizona University
<b>California</b>	Dennis J. Aigner, University of California, Santa Barbara
	Kenneth J. Arrow, Stanford University
	Ted Bergstrom, University of California, Santa Barbara
	Christopher Costello, University of California, Santa Barbara
	Robert Deacon, University of California, Santa Barbara
	Stephen J. DeCanio, University of California, Santa Barbara
	Anthony Fisher, University of California, Berkeley
	Lawrence Goulder, Stanford University
	Steve Hackett, Humboldt State University
	Michael Hanemann, University of California, Berkeley

Amy Horne, Sierra Business Council  
Daniel Ihara, Center for Environmental Economic Development  
Charles Kolstad, University of California, Santa Barbara  
Stephan Kroll, California State University, Sacramento  
Peter Kuhn, University of California, Santa Barbara  
Carol McAusland, University of California, Santa Barbara  
John M. Marshall, University of California, Santa Barbara  
Wade E. Martin, California State University, Long Beach  
Roger Noll, Stanford University  
Richard B. Norgaard, University of California, Berkeley  
Kenneth Small, University of California at Irvine  
David Starrett, Stanford University

**Colorado**

Lee J. Alston, University of Colorado  
Janis M. Carey, Colorado School of Mines  
Katherine Carson, Affiliation: United States Air Force Academy  
Brad Crowder, U.S. Environmental Protection Agency  
Graham A. Davis, Colorado School of Mines  
Nicholas Flores, University of Colorado  
Philip E. Graves, University of Colorado  
Marie Leigh Livingston, University of Northern Colorado  
John Loomis, Colorado State University  
Pete Morton, The Wilderness Society  
Jennie Spelman Rice, Consulting Economist  
Linda Stanley, Colorado State University

**Idaho**

Joel Hamilton, University of Idaho  
Peter M. Lichtenstein, Boise State University  
Christine Loucks, Boise State University  
Gundars Rudzitis, University of Idaho  
Tesa Stegner, Idaho State University  
Robert Tokle, Idaho State University

**Montana**

Richard Barrett, University of Montana  
Douglas Dalenberg, University of Montana  
Tom Power, University of Montana  
Ray Rasker, Sonoran Institute and Montana State University

**Nevada** Mary Riddel, University of Nevada, Las Vegas  
Kimberley Rollins, University of Nevada, Reno  
Douglass Shaw, University of Nevada, Reno

**New Mexico** Robert Berrrens, University of New Mexico  
Alok K. Bohara, University of New Mexico  
Chris Nunn Garcia, New Mexico Highlands University  
Kristine M. Grimsrud, University of New Mexico  
Tom McGuckin, New Mexico State University

**Oregon** Randall Bluffstone, Portland State University  
Trudy Ann Cameron, University of Oregon  
Tom Carroll, Central Oregon Community College  
Kimberly A. Clausing, Reed College  
Ronald B. Davies, University of Oregon  
David Ervin, Portland State University  
Eban Goodstein, Lewis & Clark University  
Joe Kerkvliet, Oregon State University  
K. John McConnell, Oregon Health & Science University  
Don Negri, Willamette University  
Noelwah Netusil, Reed College  
Ernie Niemi, ECONorthwest  
Arthur O'Sullivan, Lewis & Clark College  
Andrew J. Plantinga, Oregon State University  
Carl M. Stevens, Reed College  
Ed Whitelaw, University of Oregon

**Utah** Arthur Caplan, Utah State University  
Therese Grijalva, Weber State University  
Robert J. Lilieholm, Utah State University

**Washington** Gardner Brown, University of Washington  
Ken Casavant, Washington State University  
Dan Hagen, Western Washington University  
Steve Henson, Western Washington University  
Hart Hodges, Western Washington University  
Ray Huffaker, Washington State University

Karin Sable, University of Puget Sound  
Kate Stirling, University of Puget Sound  
Norm Whittlesey, Washington State University

**Wyoming**

David Aadland, University of Wyoming  
Ed Barbier, University of Wyoming  
Tom Crocker, University of Wyoming  
Robert W. Godby, University of Wyoming  
Jason Shogren, University of Wyoming  
John Tschirhart, University of Wyoming

**Other states**

Daniel Bromley, University of Wisconsin  
Dallas Burtraw, Resources for the Future  
Ujjayant Chakravorty, Emory University  
Paul N. Courant, University of Michigan  
Ronald Cummings, Georgia State University (Univ. New Mexico, emeritus)  
Robert Haveman, University of Wisconsin-Madison  
Thomas S. Jayne, Michigan State University  
Matthew Martin, Economy.com  
Kenneth E. (Ted) McConnell, University of Maryland  
Michael R. Moore, University of Michigan  
Rodney B.W. Smith, University of Minnesota  
Robert Solow, Massachusetts Institute of Technology  
John Sorrentino, Temple University Ambler  
Ivar Strand, University of Maryland  
Dave Tschirley, Michigan State University

*For information about this paper, please send inquiries to:*

*Ed Whitelaw  
c/o 99 W. 10<sup>th</sup> Avenue, #400  
Eugene, Oregon 97401  
phone: 541-687-0051  
email: whitelaw@eugene.econw.com*

*Please cite this paper to Ed Whitelaw, editor.*