ASSESSMENT OF AQUATIC ECOSYSTEMS IN EASTERN OREGON AND WASHINGTON: THE EASTSIDE ASSESSMENT REPORT

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We have been looking at historic trends in the Columbia Basin, particularly in the streams and riparian zones, for a number of years now. When we do assessments, we try to view streams in their past, present, and future conditions because defining a stream's range of variability is very much influenced by both past and future trends. Historical and future contexts become very important in assessing fisheries potential for a basin.

Comparing the Upper Yakima Basin Teanaway River between 1890 and twenty to thirty years later, reveals dramatic differences. A photo from 1890 shows an undisturbed riparian ecosystem, while a latter photo shows cut logs that were left on the ground until the river filled so they could be floated down to a mill.

Many events, early in the century, changed big stream channels in eastside ecosystems. The figures in these slides indicate the volumes, time periods, and intensities of some of those activities. You can construct these figures for virtually every river system that is navigable and for which the Corp of Engineers kept notes.

In the late 1800s, hydraulic mining got started in many eastside areas. This was followed by big dredges on Powder River, the Grande Ronde, and many Idaho rivers. Then, in the 1930s, the dams were built. All of these affected fish and fish potential, particularly the dams. A whole series of dams were built in the major mainstems. The dams along the Methow and Wenatchee Rivers tend to pass fish better than the dams on the Snake, which tend to grind up fish. But any dam makes passage difficult for fish.

Dams brought tremendous irrigation potential. There has been significant development in terms of water usage within eastside basins. Looking back to the turn of the century, you can see irrigated land in Oregon, mostly on the eastside. This water usage was not trivial along the major river valleys like the John Day and the Deschutes. Water usage peaked out in the 1980s. Similar trends can be seen in eastern Washington and in Idaho.

At the same time, the dam reservoirs altered habitats, particularly where there was little riparian habitat. Also, species like walleye and bass were introduced, causing major predation of the native fish. These species consume salmon, creating a conflict in how to deal with them. There is a large constituency which fishes for walleye and bass and this affects the way in which we look at the fish potential and restoring salmon.

Using automobile registrations as a measure of population increase over the last 100 years, and comparing this curve with those for fishing licenses and road mileage, you'll find the slopes of the curves are the same. As population has increased we have moved into more areas, road densities have increased, and we have put more pressure on streams. In fact, the current impact on the resources has changed; not only in terms of over-fishing in stocking areas and high lakes, but in small streams. This enormous increase in fishing over the past 40 years, coupled with the physical impact of roads and access, has had a dramatic impact on the ecosystem.

These impacts are not going to go away, nor will they lessen. Road building is very much a part of our societal infrastructure. For example, the road from La Grande to Ukiah will be widened so it will pass people easier and be less susceptible to floods. At the same time, it is taking out well over 40% of the riparian habitat on many streams. These are permanent losses; societal costs for living and occupying landscapes. If you look at the road increases on Region 6 National Forest land since 1964, we have gone from about 23,000 miles to well over 100,000 miles. There are, at least, an additional 25,000 or 35,000 miles in spur roads and landings. This isn't a trivial increase in terms of the impacts on the land in a very short period of time. Many of the road systems we have in the heavily forested areas represent significant risks to fish.

At the same time we are putting all these roads in, we also have floods. Floods are a natural disturbance which can not be prevented. Attempts to restore damaged streams often call for bulldozing a single channel and installing a levy on one side. This creates simple habitat rather than the complex habitat preferred by fish, including the threatened Chinook salmon.

One of the major Columbia River Basin databases is a survey done in the 1930s and 1940s. More than 5,000 miles of stream in the Columbia River drainage were surveyed every 100 paces. Pool depth and size, and substrate characteristics were recorded. This data allows one to measure quantifiable changes in fish habitat over the last 50 years by going back and resurveying. The surveyor bias in these historical surveys was very small when you focus on large pools. Focusing on other details in the survey, you cannot tell one observer from the other. Resurveys are strongly biased towards finding more pools. We reduced the qualifying pool depth for a large pool to remove the hydrologic year variability. Our resurveys were more precise and we calculated survey or variability much like timber cruisers calculate variability, by sampling and measuring every now and then. Large pools are important because they are resting areas for returning adults, rearing areas for the juveniles to reach sea-going size, refuges during drought and winter freeze-up ,and they maintain virtually all the salmon species and age classes. They are a very important biodiversity component within the landscape.

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The frequency of large pools within the Columbia Basin has increased. There are big increases in the Wenatchee and Methow River systems in terms of pools per mile. Yakima increased on a percentage basis; historically it was low but it did show an increase. In many other areas you see very noticeable and significant reductions in pools. The changes within the Snake Basin managed landscapes are a little over 50-60%. The Grande Ronde Basin showed tremendous variability in feeder streams. The message is that there is tremendous variability around these means in the historical dataset, but very little variability around the 1990 mean. For example, on the Grande Ronde we have altered it so that it is now a very simplified system.

In virtually all wilderness and unmanaged areas, huge increases are evident in terms of large pools. These are areas that have experienced major fires, floods and earthquakes over the last 50-60 years. The greatest increases are in pools that are 3 feet or greater. However, the very largest pools showed a significant decrease. The Columbia Basin, with the exception of the Methow Valley, experienced tremendous decreases in the largest and deepest pools. This is not surprising, given the constraints along streams and the increases in sedimentation. What this has led to is a reduced rearing capacity for juvenile fish species, concentrations of returning adults in fewer holding areas, and both juvenile and adult salmon being much more susceptible to predation, diseases, and catastrophic events like floods and droughts.

In wilderness areas—areas we currently describe as nearly pristine—decreases are in the 50-60% range. This demonstrates the point that we have very little quantifiable data that can accurately define what is "pristine" or "high quality." Similar surveys are necessary to produce replicable benchmarks. Our standards should not be based on where we are at a particular time, but where we are ecologically—a more replicable quantifiable benchmark. Otherwise, we will experience continued degradation which will actually be termed good or fair.

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