

A Two Century History of Pacific Northwest Salmon: Lessons Learned for Achieving a Sustainable Future¹

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Citation: Lackey, Robert T. 2004. A two century history of Pacific Northwest salmon: lessons learned for achieving a sustainable future. Plenary lecture, Annual Meeting of the North Pacific International Chapter, *American Fisheries Society*, November 1-3, 2004, Stevenson, Washington.

¹*Plenary lecture, Annual Meeting of the North Pacific International Chapter of the American Fisheries Society, November 1-3, 2004, Stevenson, Washington. The views and comments presented are those of the author and do not necessarily represent those of any organization.*

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Abstract

Achieving ecological sustainability is a daunting challenge. In the Pacific Northwest one of the most highly visible public policy debates concerns the future of salmon populations. Throughout the Pacific Northwest, many wild salmon stocks have declined and some have disappeared. The decline was induced by an extensively studied and reasonably well-understood combination of causal agents. The public appears to support reversing the decline of wild salmon, yet, according to many experts, the long-term prognosis is poor for maintaining even today's level of wild runs. Careful evaluation of the history of the decline, coupled with a few largely indisputable scientific facts, yields several overarching lessons learned that are relevant to current efforts to achieve long-term ecological sustainability: (1) most rules of commerce and economic growth work against salmon recovery; (2) the current trajectory for the region's human population precludes some frequently stated recovery goals; (3) individual and collective life-style preferences demonstrate that recovery is less important than many advocates assert; and (4) increasing scarcity of key natural resources will constrain ecological options. These lessons learned collectively demonstrate that without substantial and pervasive changes in individual and collective lifestyles, the status of wild salmon through this century will likely continue the well-documented path of the past 150 years.

Introduction

My assignment from the program committee is really quite simple:

“ . . . say something insightful about ecological sustainability based on the lessons learned since the explorations of Alexander Mackenzie, Meriwether Lewis, William Clark, Simon Fraser, David Douglas, and others.”

Right off the bat, I'll confess that “sustainability” is not one of my favorite words. To most people I've asked, it conveys ambiguous, often contradictory policy preferences. In short, the word doesn't really convey any clear-cut policy message or directive — other than it sounds like something that we all ought to be in favor of.

Do an Internet search on “sustainability” — you'll see that the word has become a feel-good slogan that surely contains something of policy significance, but no one is sure what that something is. Both the *economic development* “smart growth” proponents — and the voluntary simplicity “back to yesterday” advocates use the word as a defining rallying cry. Sustainability obviously must mean something very different to these polar opposite groups.

OK, the word and concept may be beyond repair — at least in a 30 minute talk. Where do we go now?

My approach today is to use wild salmon as a practical, relevant surrogate for ecological sustainability. It's not a perfect surrogate, but it is a practical one and maintaining healthy wild salmon runs is also important to many people — as polling data clearly demonstrates.

But even when focusing on something tangible like sustaining wild salmon, it is easy end up spouting platitudes about how if we all just worked together — we could achieve our mutual goals and we'd all live happily ever after. We've all heard those kinds of talks at AFS meetings. I've even given my share. But that's being Pollyannaish — and I'll try to avoid it this time.

I'll also try to be candid — perhaps uncomfortably candid for some of you. You may well argue with my take on the lessons learned and the options for achieving a sustainable wild salmon future, but I'm not here to cheerlead in favor of wild salmon, nor am I here to provide a requiem for them.

So . . . set aside your optimism — forego your pessimism — here's my stab at realism.

And just to be doubly sure — in case anyone out there is taking names and notes — my comments are my own and not necessarily those of any organization, including my employer.

Well, looking over the history of the past 2 centuries from a salmon-centric perspective, what lessons have we learned relative to achieving ecological sustainability in the Pacific Northwest?

Historical Perspective

To answer this question, first we have to at least roughly agree on how we got to where we are now.

I'll begin with the agents, the proximal causes of salmon decline in the Pacific Northwest. It is an old story — a sad story to many — so I'll begin — *and end* — with a two simple statements of fact. The first statement:

“... in spite of abundant uncertainty about the relative importance of the various factors that drove the decline of wild salmon in Oregon, Washington, Idaho, and southern British Columbia, we fundamentally recognize — we fundamentally know — the direct causes of the long-term decline.”

In short, we know a lot about the causes of the decline. The causes have been — and often still are:

- intense commercial, recreational, and subsistence fishing and, *especially these days*, mixed stock fishing;
- freshwater and estuarine habitat alteration due to urbanizing, farming, logging, and ranching;
- dams built and operated for electricity generation, flood control, irrigation, and other purposes;
- water withdrawals for agricultural, municipal, or commercial needs;
- stream and river channel alteration, diking, and riparian corridor modifications;

- artificial propagation used to supplement lost or diminished runs — or — to produce meat for the retail market;
- predation by marine mammals, birds, and other fish species, often exacerbated by unintentionally concentrating salmon or their predators;
- competition, *especially competition with exotic fish species*, many of which are better adapted to the highly altered aquatic environments we now have in this region;
- diseases and parasites;
- pollutants from a myriad of sources;
- reduction in the annual replenishment of nutrients from spawned-out, decomposing salmon; *and*
- just to be safe — possibly others.

To no one's surprise, it is a long list — and it covers most — probably all of the human enterprise.

And we know that ocean and climatic conditions also have a big influence on salmon abundance even if we don't understand exactly how they work.

But we know even more — *even if many of us don't like to acknowledge it* — we know much more about the decline of wild salmon in the Pacific Northwest.

We know about the trajectory. Let me offer a second statement of fact:

“ . . . as we move into a new century in Oregon, Washington, Idaho, and southern British Columbia — in spite of ups and downs — good years and bad years — favorable and unfavorable ocean conditions — even newspaper headlines proclaiming record runs — wild salmon have been on a 150 year downward trend — and wild runs are now at very low levels.”

In the Pacific Northwest wild salmon are well on their way to attaining a status enjoyed

by some of their notable brethren — *wolves, condors, grizzlies, bison* — wild animals that are unlikely to disappear entirely, but struggle to hang on as remnants of once flourishing species in small portions of their original range.

OK. Those are my two scientific facts if you will — the “how we got here” part of my talk.

First, the direct causes of the decline cover the entire human enterprise and are pretty much known; and

Second, wild salmon runs have been in a century and a half decline and are now at very low levels.

So much for the agents of salmon decline — the factors about which so many of us have devoted our careers.

If society wants to have significant and sustainable runs of wild salmon in the Pacific Northwest through this century, what have we learned from the past that will help chart a preferred future?

Lesson #1

The first lesson learned doesn't have anything to do directly with salmon biology or anything else that most of us have been trained to think about.

The first lesson is:

“. . . the rules of commerce, especially trends in “free trade” and “free markets” that drive increasing market globalization — such rules will have to change if significant, sustainable runs of wild salmon are to be maintained through this century.”

Our collective drive for economic efficiency — and low cost production — is a widely professed approach to trade, both within and between nations. My purpose this morning is not to argue for — *or against* — such a philosophy of commerce, but rather to spotlight its impact on wild salmon.

My assumption is that economic efficiency — *and the corollary of “free markets, free*

trade” — will continue to be a dominant government policy through this century. One upshot of such an approach to commerce is that non-economic values — *such as preserving remnant wild salmon runs* — tend not to get weighted very heavily in decision-making.

We obtain our computers from where they can be manufactured for the least cost. We move our automobile assembly plants to where they can produce cars most inexpensively. We tend to produce electricity in the most cost-effective way. We obtain most of our wheat where it can be grown most productively and consistently. We obtain wood products where trees can be grown, harvested, and processed efficiently and sold at the lowest price.

If any trading partner puts up barriers to such free markets, charges of unfair trading practices may well be referred to the WTO.

Even closer to home, we buy our salmon from aquacultural vendors from Chile, Scotland, Norway, and British Columbia. Most consumers — but certainly not all of them — no longer appear willing to pay a premium for wild fish, nor are they willing to limit their salmon consumption to only a few months of the year.

In a free market, the consumer is king. Dollars spent are votes cast.

The benefits of public policies that favor economic efficiency are well recognized, but there are also consequences — *consequences that are not all that favorable to wild salmon*. How much more are people willing to pay for bread — for electricity — or for paper — produced in ways that will help restore wild salmon? Don’t hide behind the pabulum that bread, electricity, and paper can be produced just as cheaply in a salmon-friendly manner. They cannot.

Each of you can also speculate, but as I observe consumer behavior today and guess about the future, I don’t see much willingness on most people’s part to pay much more for salmon-friendly products. How many of us think about the effects of products on salmon as we — select bread from the grocer’s shelf — a ream of paper from the supply room — or a bright red tomato in February. All of these products may have adverse effects on salmon, but it’s just not part of decision-making for most people.

As for economic alternatives to free markets and free trade that might possibly be better from a salmon-centric perspective — the obvious alternative — the centrally planned economies — nearly all were in economic ruins by the end of the 20th century. The destruction of the Berlin wall was in part the symbolic act of acknowledgment that the centrally

planned economic systems had failed. Was economic central planning a more salmon friendly alternative? No, salmon did worse in those economic systems.

So what are the alternatives to free markets, free trade? I'll leave that for another speaker to consider.

OK, that is the first lesson learned, the rules of commerce and their influence on the future of wild salmon.

Lesson #2

The second lesson learned is:

“ . . . the number of humans in the region almost certainly will continue to increase and, unless this trajectory is dramatically altered, the aggregate demand to support this number of humans will constrain the abundance of wild salmon.”

The most probable scenario for the human population trajectory through this century in this region — the most nearly certain scenario — *is upward* — substantially upward.

Its not popular to raise this issue. It is a taboo subject in most policy discussions. Even environmental advocacy groups seem to avoid it like the plague in spite of the fact that it dwarfs most of the human behaviors that they are trying to modify. Wild salmon advocacy groups also rarely even mention the Pacific Northwest population trajectory, much less take a clear policy position.

I can appreciate their dilemma.

Advocacy groups avoid raising it for some practical reasons. As one of my colleagues told me when we chatted about what I might say here:

“Bob, you are absolutely right, most people already know it, and that’s exactly why you should let it rest. Back off. You’ll leave the proponents of wild salmon restoration depressed. Worse, you’ll have the rest of the audience wondering why you are pontificating on the intuitively obvious. And you run the risk of being attacked as a racist, nativist, xenophobe, cultural imperialist, or, at the very least, an economic elitist.”

Undoubtedly sound advice.

However, if society wishes to do anything meaningful about moving wild salmon off their current, long-term, downward trajectory, then something must be done about the unrelenting growth in the number of humans in the Pacific Northwest.

I am not here to argue that we collectively ought to change any policy, but the simple and inescapable fact is that the human population level in this region that we should realistically anticipate through the rest of this century is a serious barrier — a show stopper — a show stopper to achieving any significant long-term wild salmon sustainability.

Many of you may wish it otherwise, but that's the way it looks to me. It's a sobering lesson to be learned.

Yes, most demographic forecasts show a flattening of the world population growth rate through this century — even a dramatic decline in the populations of most western European nations and Japan — and such may well be the case. But, for the Pacific Northwest there is another story. It largely one of immigration — continuing immigration.

15 million humans currently live in Washington, Oregon, Idaho, and British Columbia. Assuming a range of likely human reproductive rates, migration to the Pacific Northwest from elsewhere in Canada and the United States, and continuing *de facto* immigration policy — by 2100 this region's human population will not be its present 15 million — but rather will be somewhere between 50 and 100 million — a *quadrupling* of the region's human population by the end of this century — less than 100 years from now.

Visualize 50 or 100 million people in this region, *and* their demands for:

“. . . housing, schools, tennis courts — parks with a dozen soccer fields — expressways, planes, trains, automobiles — Starbucks, Tim Hortons, WalMarts — electricity, drinking water, natural gas pipelines, marinas — 10 screen movie theaters, ski resorts, golf courses — weedless lawns watered by automatic sprinkling systems — and conference centers overlooking once great salmon rivers.”

Let's speculate about 2100 and the footprint of the human population.

Visualize Washington and southern British Columbia in 2100 — with its metropolis of *Seavan*. You know *Seavan* — it mushroomed into a truly great, world-class city as smaller,

discrete urban areas back in 2004 grew together. Seavan in 2100 stretches from Olympia in south Puget Sound — northward through the once stand-alone cities of Tacoma, Seattle, and Bellingham — on to Vancouver — east to Hope — and west to cover the southern half of Vancouver Island.

Rather than the 6 million people back in 2004, Seavan in 2100 rivals present day Mexico City and Tokyo with its 24 million inhabitants. A truly great city.

Visualize Oregon and southern Washington in 2100 with *Portgene* — the other great metropolis in the Pacific Northwest. Portgene extends from its southern suburbs of what was once the stand-alone cities of Eugene, Corvallis, and Salem — northward to Portland — and across the Columbia River to Vancouver, Washington — and onward to sprawling suburbs to the east, west, and north.

Remember back in 2004, of what was to eventually grow into Portgene, its population then was a mere 3 million. In 2100, it is a whopping 12 million. Not quite as magnificent as Seavan, but respectable none-the-less.

Regardless of whether my assessment turns out to be right or wrong, population issues are not easy ones to raise — much less discuss — without resort to policy advocacy. There are understandable, strategic reasons why the big environmental groups — most groups in fact — stay clear of population issues these days.

But this sustainability lesson learned is inescapable: the current and expected population level in the Pacific Northwest is at the core of any credible analysis of potential wild salmon sustainability strategies — or at least those strategies that are offered as serious attempts to actually maintain significant, sustainable runs.

Lesson #3

The third lesson deals with individuals rather than society at large or our social and economic systems. This basic lesson learned is that most people inhabiting this region will each have to change dramatically if wild salmon are to reach significant levels of sustainability. More precisely, the lesson learned is:

“ . . . individual and collective preferences directly determine the future sustainability of wild salmon, and substantial and pervasive changes must take place in these preferences if the

current long-term, downward trend in wild salmon abundance is to be reversed.”

This lesson learned is perhaps the most obvious and ultimately the most important. You could even make the case that it subsumes the others.

Among most folks in this room, it might be easy to assume that salmon are near the top of the public’s priorities. Just look at opinion surveys. *Everyone* supports salmon and especially wild salmon! But, the fact is that salmon recovery is only one of many priorities that individuals profess to rank high.

It is difficult for me to conceive this, but that’s the situation outside this room. Even my kids who I’ve had three decades to inculcate, regularly admonish me:

“Dad, get a life. Most people out here in the real world just don’t care that much about restoring wild salmon. They have other things to worry about!”

Society’s collective behavior — *its actions* — not public opinion polls — not thick recovery plans — people’s individual and collective behavior — gives us the best indication . . . and political will rarely diverges from societal will, at least for very long. That’s really the lesson to be learned.

Let me offer a specific example.

Remember what happened in the United States in 1991. The first salmon “distinct population segment” was listed under terms of the U.S. Endangered Species Act. With this listing of salmon as a protected species, the policy debate shifted in the U.S. Pacific Northwest — it shifted away from restoring salmon runs in order to support *fishing* — to protecting wild salmon runs from *extinction* — two very different policy objectives.

And to make sure it actually happened, there was the additional legal muscle and bureaucratic inflexibility of the Endangered Species Act — and overseen by a gaggle of advocacy groups backed up by a pack of aggressive lawyers. A pretty clear policy shift.

The residents of the U.S. Pacific Northwest had apparently made a choice.

Did they?

Jump ahead 10 years to 2001. Just a decade after the first salmon listing, a severe

drought — combined with ongoing electrical blackouts — provoked the Bonneville Power Administration to declare a power emergency — abandon previously agreed upon interagency salmon restoration commitments — and generate electricity flat out using water reserved to help salmon smolts migrate.

In one of the most striking recent barometers of competing societal priorities — air conditioners, hair dryers, and toasters — electricity — won out over both wild and hatchery-bred salmon — and with *scant public opposition*.

No street protests. No significant legal challenges. No elected officials publicly pleading for salmon. No environmental group blanketing the Internet with calls to mobilize fax machines in defense of salmon. No campus teach-ins. No AFS resolution.

Near complete silence.

Over the past 200 years, we have made plenty of these kinds of choices — contradictory, opposing, apparently inconsistent — and these choices roughly reflect our collective and relative priority for wild salmon. These choices are tradeoffs — and we continue to make them — and these choices are the real measure of the relative importance of salmon to society.

Now, I'm not here to cheerlead for of wild salmon — or for electricity — or for property rights — or for hatcheries — or *for* dredging shipping channels — or for having a McDonalds, Tim Hortons, and Starbucks on every corner in North America — but it is naive to consider salmon recovery as anything but one element — one often minor element — in a constellation of competing — often mutually exclusive — *wants, needs, and preferences*.

It is an important, but sobering lesson to be learned.

Lesson #4

Let's move to the fourth and final lesson for achieving a sustainable wild salmon future — it concerns trends in key natural resources. More precisely, the lesson learned is:

“ . . . the demand for critical natural resources, especially for high quality water, will continue to be great (and increase) through this century — and competition for these critical natural resources will be a key constraint to maintaining significant,

sustainable runs of wild salmon.”

Many rivers in Oregon, Washington, Idaho, and southern BC currently suffer from water shortages — *especially shortages of high quality water*. And, our seemingly insatiable demand for fresh water shows little sign of letting up — *nor* do I think anyone honestly expects it to do so anytime soon.

Keep in mind, I am not arguing that allocating water for salmon is more — *or less* — important than allocating it for alternative uses, but, as competition for scarce water gets much more intense, how will advocates for wild salmon fare relative to advocates for competing priorities such as:

- *water for drinking*
- *water for irrigation*
- *water for manufacturing*
- *water for generating electricity*
- *or water for any of a thousand other needs?*

The on-going and vicious water war in the Klamath Basin provides a *glimpse* of the future — with farmers defying law enforcement agents — illegally opening locked valves and releasing water to irrigate their fields — with streams choked with dying salmon caused by low water flows and poor water quality — with lawyers from various competing interest groups dueling in court over who will get how much water.

And — *at the end of the day* — every faction in the battle being dissatisfied with the result — feeling their priority interest didn't end up with a fair share of the water — and figuring out ways to be more politically effective in next year's battle.

And it's not just water that is becoming increasingly scarce. Land — somewhere to build a second home — a place to build the next mega-casino — a mountain watershed to accommodate the next Whistler. Look at the Okanagan in BC or the Deschutes in Oregon. From rural to urban in 50 years — and expected to double again by 2025.

Life for an individual — *as well as for society* — is a series of trade-offs — of choices — of selections between appealing alternatives.

As key natural resources become more scarce through this century, I predict that the individual and collective choices required for maintaining long-term, sustainable wild salmon

abundance will become increasingly unacceptable to more and more people.

That's my final lesson to be learned — not pretty, but I'm afraid it is realistic.

Conclusion

OK. Those are my four lessons learned about what must be done to overcome the impediments to achieving ecological sustainability in the Pacific Northwest and using wild salmon as a surrogate.

Let me wrap up with a few take-home messages about delusions — which are so common in most discussions about sustainability and the future of wild salmon.

Delusions are the product of our mind games that let us accommodate unpleasant realities. The ability to create delusions probably has some evolutionary advantage, but for those of us who provide science to decision makers and the public — we must rise above this proclivity.

Whether you liked it or not — you have heard my take on the 19th, 20th, and 21st centuries from a salmon-centric, sustainability perspective. Remember, I warned you I wasn't going to give the traditional feel-good talk.

For those who have a policy predilection to restore wild salmon, I am sure that it is not a cheerful message.

But, for those who rank restoring wild salmon as just one of many societal priorities, my forecast also may not be all that uplifting — because we will probably continue to spend billions of dollars in a restoration effort that will likely be only marginally successful over the long-term.

I do recognize that by making a few different assumptions about the future, my forecast would change. And certainly, there are other options if society wants to move toward artificially maintained runs. But in making the assumptions I did about the future of wild salmon, I struggled to avoid succumbing to unfounded pessimism — or to baseless optimism.

No delusions either way.

I'll end with a prediction and also offer a challenge to wild salmon advocates — it's also

an opportunity:

“ . . . any policy or plan targeted to restore wild salmon runs must at least implicitly respond to these 4 lessons learned or that plan will fail. It will be added to an already long list of prior, noble, earnest, and failed restoration attempts.”

Look down the road to the end of this century — to 2100:

- less than 10 decades away;
- only a few dozen generations of salmon beyond today’s runs;
- just 2 or 3 Ocean Oscillations from now;
- to a time when the Pacific Northwest’s human population will not be its present 15 million, but rather will be somewhere between 50 and 100 million;

Even given all this, there are still salmon recovery options that are likely to be ecologically viable — and probably socially acceptable — but the range of options continues to narrow.

For professional fisheries experts — for many of us — for fisheries scientists, technocrats, analysts, and managers — for those of us who are involved with salmon issues in the Pacific Northwest — the lessons learned are especially crucial because:

- it is past time for us to abandon both crippling pessimism and delusional optimism

rather

- it is now time to replace both with uncompromising ecological realism and forthright policy analysis.

Thank you.

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Author Biographic Sketch

Dr. Robert T. Lackey is senior fisheries biologist at the U.S. Environmental Protection Agency's research laboratory in Corvallis, Oregon. For over two decades, he has also been courtesy professor of fisheries science and adjunct professor of political science at Oregon State University. Since his first fisheries job 40 years ago mucking out raceways in a Sierra Nevada trout hatchery, he has dealt with a range of natural resource issues from positions in government and academia. His professional work has involved many aspects of natural resource management and, especially, the interface between science and public policy. He has published over 100 scientific and technical articles. His current professional focus is providing policy-relevant science to help inform ongoing salmon policy discussions. Dr. Lackey also has long been active in natural resources education, having taught at six North American universities. He continues to regularly teach a graduate course in ecological policy at Oregon State University and was a 1999-2000 Fulbright Scholar at the University of Northern British Columbia. A Canadian by birth, Dr. Lackey holds a Doctor of Philosophy degree in Fisheries and Wildlife Science from Colorado State University, where he was selected as the 2001 Honored Alumnus from the College of Natural Resources. He is a Certified Fisheries Scientist and a Fellow in the American Institute of Fishery Research Biologists.