Salmon Recovery:
Learning from Successes and Failures

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Salmon Recovery: Learning from Successes and Failures[1]

by

Robert T. Lackey[2]

Introduction

In this essay, I propose an answer to the question: What has been learned from 150 yr of efforts to protect and restore wild salmon in western North America?

Wild Pacific salmon in the lower 48 states are well on their way to attaining a status enjoyed by some of their notable brethren — wolves, condors, grizzlies, cougars, bison — wild animals that are unlikely to disappear entirely, but struggle to hang on as remnants of once flourishing species in limited portions of their original range (Lackey 2000). In California, Oregon, Idaho, Washington, and the Columbia River portion of British Columbia, many runs are reduced to <10% of their historical abundance. Some are much less than 10%. An unknown number have been extirpated (Lichatowich 1999).

Other salmon runs are dominated by hatchery-bred fish. Even for the Columbia, once the mightiest salmon-producing river south of Canada, over 80% of the total run comprises hatchery-bred fish (Lichatowich 1999). In the lower 48 states, fishing continues only because hundreds of hatcheries are able to keep runs at sufficiently high levels (Lackey 2000).

The chronicle of salmon decline in the Pacific Northwest is not unique. Of the Earth's four regions where Pacific and Atlantic salmon runs originally occurred, it looks increasingly like western North America will emulate the Asian Far East, Atlantic Europe, and eastern North America in having extirpated or much reduced runs in the southern portions of the distribution, and larger runs, closer to historical levels, in the northern portions.

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When I look at the current status of wild salmon and apply common-sense, realistic assumptions, by 2100 the Pacific Northwest, south of mid-British Columbia, most likely will look like the U.S. portion of eastern North America, Europe south of Scandinavia, and the Asian Far East south of Russia. In all four regions, wild salmon runs likely will be a shadow of the past over much of the original range. Wild salmon runs in Alaska, Yukon, and northern British Columbia most likely will remain relatively healthy, or at least better off than those in the contiguous United States.

Such a forecast is not pleasing news for those who highly value wild salmon, nor is it pleasing news for those who do not rank salmon restoration as exceptionally important when compared with other societal needs. From their perspective, continuing the current salmon restoration policy wastes too much money, causes unnecessary social strife, and perpetuates a band of lawyers, lobbyists, and technocrats to act as policy mercenaries, all for a policy objective that many experts think probably will not be successful (Buchal 1998).

Policy Context

How did the Pacific Northwest get into this apparent conundrum in which no political faction is happy? The answer is embedded within past and current policy contexts. Let me describe a few points in salmon history from a policy perspective.

The year 1848, 154 yr ago, marked the beginning of the downward spiral for salmon in western North America (Lackey 2000). The precise date was 24 January 1848, the day gold was discovered near John Sutter's Sawmill overlooking the Central Valley of California. Gold mining proved to be a singularly salmon-unfriendly activity. Mining operations expanded rapidly to the watersheds surrounding the Central Valley, and the effect on salmon runs was immediate, massive, and obvious.

So began the decline of wild salmon that soon spread across the region. Mining was not the only human activity that adversely affected salmon. Fishing, farming, grazing, logging, diking, dredging, filling, clearing, building, constructing, paving, polluting, damming, diverting, channelizing, irrigating, and many other human enterprises, all contributed to the decline of salmon runs (Lichatowich 1999, Taylor 1999).

A century and a half of experience with managing salmon runs should reveal some general patterns, a few principles, and a handful of lessons learned — those that are likely to remain relevant through the current century. I will propose five lessons that are central to understanding the salmon decline and especially public policies concerning salmon recovery.

Policy Lesson 1 — Policy Goals Are Fleeting

Perhaps most obvious, and arguably the most important lesson is the realization that salmon policy goals tend to be fleeting. Societal priorities are dynamic, difficult to forecast, subject to rapid change, and, perhaps most frustrating to technocrats, impossible to quantify accurately. Remember how the recent Pacific Northwest drought and California electrical blackouts affected thinking and priorities? Or even more recently, how the terrorist attacks of 11 September 2001, have so drastically recalibrated society's collective priorities? Let me recap the past 150 yr and identify a few examples of implicit public policy goals and priorities for salmon restoration.

By 1880, supplemental stocking for hatcheries was generally viewed as the solution to declining salmon runs (Lichatowich 1999, Scarce 2000). By the beginning of the 20th century, in public policy debates, hatcheries had won out over preserving or restoring natural habitat, and hatchery-bred fish had won out over wild salmon. Little more than a century later, protecting wild salmon is the preeminent statutory dictum (Taylor 1999, Lackey 2001a). Now hatchery bashing is in vogue, and it is hatcheries that are under siege as the nemesis of wild salmon runs. There is even discussion about closing some, or even all, salmon hatcheries (Buchal 1998).

A half century later, in the 1930s, the mantra was "put people to work to combat the devastating social effects of the Great Depression." Massive public works projects, such as many of the high dams of the Columbia River Basin were built, even though their ruinous effect on salmon was well known. A single dam, Grand Coulee, completely and permanently blocked a third of the Columbia Basin to migratory salmon — a thousand miles of the mainstream river lost to salmon in a single action. The Depression and public works projects won out over salmon. Now we are less sure of the priorities and we continue to spend millions trying to compensate for this lost spawning and rearing habitat.

Another half century later, in 1991, the first salmon distinct population segment or evolutionarily significant unit was listed under terms of the Endangered Species Act. With this action, the policy debate shifted away from restoring salmon runs in order to support harvest and fishing, to protecting salmon runs from extinction, two very different policy objectives (Lackey 2001a). A century ago few people cared much whether a salmon started life in a hatchery or in a redd. Now hatchery-produced salmon are not the restoration solution, they are part of the restoration problem, at least according to many.

In 2001, just a decade after the first Endangered Species Act salmon listing, a severe drought, combined with ongoing California electrical blackouts, provoked the Bonneville Power Administration to declare a power emergency, abandon previously

agreed upon interagency restoration commitments, and generate electricity using water reserved to facilitate salmon migration. In one of the most striking recent barometers of competing societal priorities, electricity won out over salmon, and with scant public opposition.

None of these public policy decisions over the past 154 yr was inherently good or bad; each simply reflected the priorities or legal interpretations of its time. We should accept that salmon policy goals have been fleeting and it seems apparent to me that 150 yr from now, society's salmon priorities will be as different as today's are from those of 150 yr ago.

Policy Lesson 2 — Time Scales Rarely Coincide

When salmon biologists talk about restoring salmon runs, they tend to look at a 50 yr time span; a 100 yr time span is even better from their perspective. It is not that salmon biologists do not want to be helpful, but we are tempered, even constrained, by what we know to be ecological reality. Recent studies have confirmed what salmon biologists have long assumed: because of shifting climatic and oceanic conditions, the abundance of salmon varies naturally and considerably over decades and centuries (Finney et al. 2002).

Bureaucrats, on the other hand, work on much shorter time scales. They must enforce the controversial, restrictive, and often unpopular provisions of laws or court judgments. A decade is too long to wait for a definitive decision, let alone 50 or 100 yr. Policy decisions will be made with the best available science, but such science may be little more than an educated guess (Buchal 1998).

Elected officials, from a scientist's perspective, operate on comically short time-frames, something less than the interval between elections, often less than 2 yr. Some advocacy groups see declining salmon runs and demand immediate, decisive action from elected or appointed officials. Others, probably the majority, see abundant hatchery fish, paid for by license holders, electricity users, and taxpayers, and demand that they be allowed to fish. Understandably, in these circumstances policy decisions are made with whatever science is available and usually without much appreciation of its high degree of uncertainty.

Although many participants in salmon policy debates cast restoration decisions as science-based or science-driven, the reality is that such short decision time-frames constrain the role science plays. In practice, the so-called best available science is often that portion of scientific knowledge that can be construed to buttress the desired policy preference.

Policy Lesson 3 — Scientists Are Essential, But Supporting Players

Let me invoke a trite, but useful theatrical metaphor: in the salmon restoration play, scientists, in their role as science-providers, are essential, but supporting players. It is not scientists' values and priorities that drive salmon policy, but those of society. Nevertheless, it is also true that a restoration strategy needs to be based on ecological reality, hence the essential role for science. Scientists are essential, not because they may advocate particular public policy priorities, but because they can provide society with the best assessment of ecological reality (Lackey 2001b). Do not assume that this is obvious and unassailable. It is not.

Most of us salmon technocrats struggle to accept the reality that there is no *scientific* imperative to restore wild salmon (Scarce 2000). But, there are also no scientific imperatives to keep energy costs low, to protect salmon gene pools, or to assert that maintaining runs of wild salmon is inherently a more desirable policy objective than using hatchery-reared salmon.

I am arguing for a clear, clean, conspicuous separation of science and decision-making, but I acknowledge that such a dichotomy is often ambiguous. But, as a guidepost, elected officials, not technocrats, have the political mandate to balance competing priorities. As we learned in college, fisheries management is mostly about people and their behaviors, not about fish.

Policy Lesson 4 — Decision Optimization Is Naive

The fourth policy lesson was not intuitive to me: an infatuation with decision optimization is naive. Our professors taught us that to achieve public policy objectives, we should manipulate decision variables to produce maximum benefits for society.

Successful fisheries management, at least according to our classic natural resource management training, is typified by calls for efficiency, maximization, optimization, goals, objectives, performance measures, and monitoring (Scarce 2000). We instinctively seem to gravitate to maximum sustainable yield, optimum sustainable yield, maximum economic yield, maximum net economic benefit, maximum social benefit, and a mish-mash of related management targets.

It is nearly impossible to isolate and measure the things that are really important to people relative to salmon restoration. For example, how do you measure the tradeoff between using water to grow potatoes vs. using the same water

to grow salmon? How important to fishermen are salmon that spawned in the wild vs. salmon that started life in a hatchery? How important is preserving the icon status of wild salmon vs. preserving private property rights? The important decisions in adjudicating salmon policy are driven, not by deference to efficiency, not by infatuation with optimization, not by devotion to management algorithms, but by passion, and passion comes from the heart, not from the latest, fastest computer chip driving the most elegant, dazzling software.

This lesson, that we technocrats must temper our penchant and infatuation with decision optimization, is difficult for many of us to accept. Decision optimization may work well on narrow, constrained, highly simplified decision problems, but not for the big, important, complex, divisive policy problems — such as reversing the decline of wild salmon.

Policy Lesson 5 — Reality is an Orphan

In many debates over salmon policy, reality is often a casualty, an orphan. By reality, I mean that which is true, or at least that which is most likely to be true. I will define reality here as the facts of the case, the unvarnished reporting of the situation, the truth as it is, not as we might wish it to be.

In adjudicating salmon policy, reality often does not have a champion, a cheerleader, a proponent (Lackey 2001b). Most organizations that fund the development or dissemination of salmon information have a policy objective or at least a policy slant or bias (Buchal 1998). For example, these organizations typically may be in favor of increasing the sale of fishing licenses; or protecting the well-being of farmers, dam operators, or stockholders; or assuring that adequate and inexpensive electricity; or enhancing windsurfing, white water rafting, or snowboarding opportunities; or obtaining grants to keep their personal or institutional research adequately funded; or protecting imperiled species or habitats (Scarce 2000).

Problems with conveying reality are not limited to salmon scientists. What has been the response to the 2001 report from the Independent Scientific Advisory Board (2001) that judged, with a stunning jolt of candor, that none of the four Federal and state plans to restore wild salmon in the Columbia Basin will likely be successful? Surprisingly, there has been almost no reaction from the proponents and managers of the four plans, or from any other faction in the continuing salmon policy fray. Are the agency employees in the salmon restoration business worried about their jobs? If they are, it is unwarranted because, to my knowledge, no one has ever been fired because of failing to restore wild salmon.

Conclusion

I will end this essay with a prediction, and also offer a challenge: Any policy or plan targeted to restore wild salmon runs must at least implicitly respond to these policy lessons or that plan will fail. It will be added to an already long list of prior, noble, earnest, and failed restoration attempts.

Imagine the end of this century, less than 10 decades away, only a few dozen generations of salmon beyond today's runs, just two or three Pacific Decadal Oscillations from now, a time when this region's human population will not be its present 15 million, but rather will be somewhere between 50 and 100 million (Lackey 2000). As we move through this century, there are salmon restoration options that are likely to be ecologically viable and probably socially acceptable, but the range of restoration options continues to narrow.

In my view, as society's fisheries experts, it is a time for neither crippling pessimism, nor delusional optimism. Rather, it is a time for uncompromising ecological realism and forthright policy analysis. Society deserves no less from us.

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Dr. Robert T. Lackey, senior fisheries biologist at the U.S. Environmental Protection Agency's research laboratory in Corvallis, Oregon, is also courtesy professor of fisheries science and adjunct professor of political science at Oregon State University. Since his first fisheries job more than four decades ago mucking out raceways in a trout hatchery, he has dealt with a range of natural resource issues from positions in government and academia. His professional work has involved many areas of natural resource management and he has written 100 scientific and technical journal 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 five 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.

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