

The Savvy Salmon Technocrat: *Life's Little Rules*

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Abstract

For over a century, salmon technocrats (fisheries scientists and kindred technical experts) have played an important role in Pacific Northwest salmon policy, but their involvement has caused them and others discomfort. The discomfort is summarized by the following observations: (1) the public, apparently, supports maintaining wild salmon runs; (2) there are competing societal priorities, many of which are partially or wholly mutually exclusive; (3) increasing numbers of people in the Pacific Northwest create additional pressures on all ecological resources (including wild salmon); (4) policy positions in the salmon policy debate are entrenched; (5) society expects salmon technocrats to help solve the salmon problem; (6) each of the many sides of the policy debate attempts to utilize salmon technocrats to bolster its argument; (7) it has proved nearly impossible for salmon technocrats to avoid being categorized as supporting a particular policy position; and (8) many policy advocates frame their policy views in scientific terms rather than value-based preferences. Involvement with salmon policy can be the professional undoing of a salmon technocrat unless his proper role is understood. From a technocrat's perspective, and in order to survive professionally, I propose several rules: (1) be honest; (2) focus on science; (3) accept that politicians covet legitimacy; (4) recognize that framing the policy question largely defines the analytical outcome; (5) avoid the allure of junk science and policy babble; (6) concede that societal values and priorities evolve; and (7) avoid technical and scientific hubris.

¹Modified from a lecture presented at Western Washington University, Bellingham, Washington, November 18, 1998. The views and opinions expressed are those of the author and not necessarily those of the Environmental Protection Agency or any other organization.

The Dilemma

Over the past century, wild salmon in the Pacific Northwest have declined in abundance, even while salmon conservation enjoyed near universal public support (Cone, 1995; Lackey, 1996; 1997; 1999; National Research Council, 1996; Stouder, *et al.*, 1996; Buchal, 1998). There have been economically costly and socially disruptive efforts to protect and restore salmon, but the downward trajectory for wild salmon continues. There is no public or bureaucratic consensus on a specific public policy to maintain or restore salmon and, although no one is happy with the situation, society seems unable, or at least unwilling, to act in an effective way to protect or restore wild salmon.

Salmon technocrats (fisheries scientists and kindred technical experts such as fisheries managers, fish passage engineers, natural resource economists, aquaculturists, fish nutritionists, *et al.*) have a role to play in helping society deal with the salmon decline, but is it the appropriate role? How does a technocrat operate in a politically charged environment where opinions are so strongly promoted? How does a technocrat keep personal political preferences from affecting professional responsibilities?

I approach this topic as a natural resource scientist. To be more specific, I am a fisheries scientist by academic and work experience. Make no mistake about it, I am an admitted salmon technocrat!

As one who has been steeped in salmon issues, it is uncomfortable to watch society and professionals craft elaborate delusions about the decline of wild salmon and the likelihood that the general decline might be reversed without massive cost and social disruption. It is not clear that society would opt to shoulder the cost and social disruption to restore wild salmon if the full scope was clearly stated.

It is my intent to be policy relevant without being a policy advocate. I do not have the ultimate "answer" to the salmon policy conundrum, nor will I help you find a better fishing hole. My purpose is to describe the current situation in salmon policy and to provide a few rules that responsible salmon technocrats should follow. Detailed discussion of the science and politics of salmon decline and attempts at restoration is available elsewhere (Lackey, 1999).

The dilemma facing the conscientious Pacific Northwest salmon technocrat is delineated by: (1) everyone, apparently, supports maintaining salmon runs; (2) there are competing societal priorities, many of which are partially or wholly mutually exclusive; (3) increasing numbers of people in the Pacific Northwest create increasing pressures on all natural resources (including wild salmon); (4) policy stances in the salmon debate are extremely entrenched; (5) society expects salmon technocrats to help solve the salmon problem; (6) each of the many sides of the policy debate

attempts to use salmon technocrats to bolster its argument; (7) it has proved to be nearly impossible for salmon technocrats to avoid being categorized as supporting a particular policy position; and (8) many policy advocates frame their policy views in scientific terms rather than value-based preferences.

For the salmon technocrat, the debate over salmon policy takes place in a battlefield of seemingly intractable policy alternatives, complex and contentious scientific challenges, and ambiguous roles for the participants. There are forceful advocacy groups representing commercial, recreational, and Indian fishermen, agricultural activities, various elements of the transportation sector, forest and range land users, electrical generators and users, land management agencies, various segments of the environmental movement, endangered species and animal rights proponents, municipal and local governments, and many others. How can the conscientious salmon technocrat play a worthwhile role in helping resolve the salmon policy conundrum, toiling in a highly contested political landscape strewn with land mines, without being ravaged professionally or personally?

If you are a salmon technocrat and feeling even the least bit haughty about your profession's effectiveness in maintaining wild salmon runs, it is past time for a reality check: the record is poor, even woeful. The more fisheries scientists have become involved with protecting salmon, the fewer wild salmon there have been. To be fair, aggrieved technocrats could argue that wild salmon runs would be much smaller had it not been for their actions, but this is merely assertion and should not be accepted blindly. Fisheries scientists, for example, dealing with salmon issues are largely limited to "situational science" — every ecological situation is a specific case and few general rules or principles exist. Unfortunately, the few general scientific principles that do exist stem largely from common sense.

Salmon policy is serious business — definitely not for the languid. Competent scientists, whether intentionally or not, routinely become embroiled in policy debates that fundamentally revolve around clashes in values and preferences, not science. We witness the spectacle of "dueling scientists" — each side in the policy debate parading scientists who articulate scientific opinions that apparently support the preferred political position. Consider, for example, the disparate opinions on the utility of salmon hatcheries even if the participants in the debate accept as true the same set of scientific facts. The protectors of biological diversity will usually implore scientists to describe how hatcheries have done much to reduce the number of wild salmon and are, thus, part of the salmon decline problem rather than part of the solution. On the other hand, if a group's goal is maintaining fishing, they often brandish scientists who will attest that three-quarters or so of the salmon returning to the Columbia River system are hatchery-bred, hence hatcheries are beneficial, if not essential, to maintaining fishing. Advocates of hydropower, in contrast, will usually argue that hatcheries are one of several tools useful in maintaining salmon runs and permit society to concurrently benefit from cheap, plentiful hydropower. Each of these

policy positions can be argued using the same set of scientific facts.

Life's Little Rules

I contend that technocrats *should* play an active role in resolving salmon policy, as technocrats should with all ecological policy issues. Technocrats can be helpful, even essential, but there are several simple rules that they should follow. The rules are not pretentious but adherence to them may be difficult. The rules are described in the context of Pacific Northwest salmon policy and the appropriate role of technocrats, but they are also applicable to other ecological policy questions.

Rule 1 – *Be honest*

Elementary on the surface, this rule is not as simple as it might appear. It is easy to avoid telling the entire truth about the ecological consequences of various salmon policy decisions and thus unintentionally mislead people. This happens because policy debates often focus on narrow, relatively insignificant technical or scientific issues. For example, there are over 250 major dams in the Columbia Basin. Arguments over the role of a single dam, or the options for transport of smolt (young salmon migrating to the ocean), for example, are interesting and controversial technical debates, but the fact is that aquatic and terrestrial habitats are drastically different today in the Columbia Basin from what they were a few hundred years ago; it is highly unlikely that *wild* salmon in substantial numbers (by historical standards) can thrive in such a highly modified environment. Society may well chose to make the tradeoffs necessary to maintain a *relatively* small number (current levels, perhaps) of wild salmon, but technocrats should be bluntly realistic about the actual number of salmon that can be expected, given the extensive alteration of the watershed.

Being honest also extends to full disclosure about scientific uncertainty and unknowns. Presenting traditional statistical expressions of uncertainty is imperative, but so is acknowledging the boundaries of scientific knowledge. Predicting the ecological consequences of policy options is often little more than enlightened conjecture, and that reality should be clearly conveyed to decision makers and the public.

Further, it is important for salmon technocrats to be honest and forthright about assumptions used in developing and presenting scientific conclusions. Depending on the assumptions used in many technical analyses, different scientific conclusions are likely. For example, in assessing the likelihood of success of salmon policy options, assumptions must be made about future demands for electricity and how those demands will be met. Reasonable people differ on what are the most realistic assumptions, but the assumptions used will substantially determine the

likelihood of success of most salmon policy options. It is wrong to hide these important assumptions from the users of the scientific information.

In my experience, few salmon technocrats intentionally lie, but what does the public *hear*? Much of the current salmon policy debate, for example, is over the extent to which freshwater habitat improvement and cyclic changes in oceanic conditions will stimulate a rejuvenation of wild salmon runs. Absent from the debate is the trajectory of human population growth in the Pacific Northwest: if the average growth rate from the past half century continues for the next century, the current population of 13 million (Oregon, Washington, Idaho, British Columbia) will swell to 85 million in 2100. Perhaps the growth rate will decline, perhaps not, but the human population in the Pacific Northwest will be much larger than it is now. To overlook the near certain reality of a much larger human population, and the corresponding implications for the future of salmon, is misleading the public. Improving salmon spawning habitat *may* have demonstrable merit for restoring wild salmon runs if the Pacific Northwest human population is static, but it will be of limited use in preserving wild salmon runs if the population quadruples in the next hundred years and fishing pressure remains high.

Rule 2 – *Focus on science*

The philosophical literature is replete with discussions of the differences between "is" and "ought" statements and whether the conduct of science is, or can ever be, value-free. The rudimentary philosophical dichotomy is that science deals with statements of fact, observation, or probability, the "is" statements. Policy advocacy deals with statements of preference, the "ought" or "should" statements. At the extreme in the salmon policy debate, the is/ought split is transparent, but it becomes much more perplexing when the specific role of salmon technocrats is examined.

Technocrats often subtly use "ought" statements under the appearance of "is" statements. For example, descriptors such as habitat *degradation* or *improvement* implicitly assume a desired condition for a particular species or ecosystem. Constructing a specific dam may be described as habitat *degradation* from a salmon's perspective, but the same dam might also be described as habitat *improvement* from a walleye's perspective. Similarly, harvesting an old growth forest and creating a meadow would be habitat *improvement* for white-tailed deer, but the same action would be habitat *degradation* for spotted owls.

In my experience, most technocrats will accept the premise that science deals with "*is*" issues, but many also hold strong personal policy preferences and those preferences often slink into what appear to be value-neutral science observations. Decision makers and the public need to be diligent to keep salmon technocrats

focused on the *is* issues, the science aspects of policy.

Demanding that salmon technocrats focus on science does not constrain their activities to esoteric, policy-irrelevant science that has little influence on society's decisions on salmon policy. On the contrary, their work and professional judgments should be presented in brutally honest, direct, and understandable ways, but avoiding advocating policy choices based on personal values or preferences.

Rule 3 – Accept that politicians covet legitimacy

We live in a society that venerates academic and professional credentials. Academic degrees and professional titles have a definite impact on most people. In fact, because politicians and appointed decision makers face difficult, controversial ecological policy choices, it is natural for them to use scientists and technocrats as a convenient political cover. It is easier to shift the blame for an unpopular policy to salmon technocrats with their aura of credentialed respectability.

Salmon technocrats need to be constantly on guard to avoid being drawn into the role of providing political cover to decision makers. There is, for example, no scientific imperative for maintaining wild salmon in the Pacific Northwest even though proponents constantly offer up implicit support from scientists: "It is clear from the science what we need to do about the salmon problem." There are certainly ecological and social consequences if wild salmon are driven to extinction, but there is nothing in science that says this should or should not be done.

No matter how much decision makers prod and plea, salmon technocrats should not offer personal opinions about which option *should* be chosen. Decisions in salmon policy are largely based on differences in values, preferences, and priorities, not science. Scientific information has a role in decision analysis, but it is primarily to state clearly the consequences of various policy alternatives, not to lobby for any particular alternative.

Rule 4 – Recognize that framing the policy question largely defines the analytical outcome

This article began with the implicit assumption that wild salmon decline was the primary policy issue of concern in the Pacific Northwest. It could have begun with a policy question focused on affordable housing, economic growth, family wage jobs, retirement security, social welfare, or education. Maintaining wild salmon is not inherently more important than the alternative societal aspirations; it is one of many competing societal aspirations. Such competing societal aspirations are not necessarily mutually exclusive, but they are linked and do compete.

Salmon technocrats must be very mindful that *a priori* framing of a policy question in salmon terms largely defines the result. The policy debate is not what should be done about wild salmon, as if it was the only policy question on the table, but rather, how important is it compared to alternatives. For example, society, in addition to "demanding" maintenance of wild salmon, "demands" personal mobility. Personal mobility means having an effective road system. Increasing numbers of people means additional roads are required, which means less good habitat for salmon, which, eventually, means less wild salmon. Thus the many small, piecemeal decisions on road construction have the long-term effect on wild salmon of causing a downward trajectory.

Arguments over framing the policy question are typically the most divisive part of the policy debate because framing the policy question is a political exercise, not a scientific one. Defining policy questions is value-based, although scientific information has a role in identifying plausible options and in predicting the ecological consequences of different policy alternatives.

Rule 5 – Avoid the allure of junk science and policy babble

"Pseudo-science" often disguises political advocacy. Concepts like ecological health, ecological integrity, sustainability, and biological diversity can be used in scientifically valid ways, but they also can be used to beguile the public and politicians. Sustainability, for example, has an inherent appeal, but what does it mean? Traditionally, technocrats defined sustainability as "producing defined ecological benefits in perpetuity." Many different ecological elements are sustainable, so which are desired? Sustainability is also possible at a variety of levels. What level of ecological yield is desired? Advocacy for "sustainability" does not really say much without a clear statement of policy preference. Further, it is a tautology to argue that sustainability must *a priori* maintain ecosystems such that their capacity to produce goods and services in the future is not reduced. There is a multitude of possible goods and services, as well as a suite of sustainable levels of those goods and services, that can be provided by ecosystems.

Use of what is pejoratively called junk science abounds. For example, ecological health is often used as a desired policy target. By implication, what do opponents of such a policy position argue for, ecological *sickness*? Ecological health is predicated on some vision of a desired ecological condition, but what is desired and who decides it? As with sustainability, it sounds noble but actually means very little in a policy context.

Ecological integrity is sometimes offered as a concept that overcomes many of the limitations of ecological health, but it also is predicated on the assumption that

there is some desired, preferred, or reference ecological condition. Who is to say that a pristine ecological condition is any better or worse than an agricultural system or urban environment? Also, who decides which ecosystems are to be chosen as the reference or baseline state? Intended or not, the very idea of *reference* sites implies that ecological conditions in the reference sites are somehow more desirable than those in the nonreference sites.

Salmon technocrats should, in my view, avoid use of such judgmental terms as health, integrity, and sustainability unless those terms are precisely defined and their implicit value-based assumptions are clearly stated. Technocrats should be sure their "science" words have precise, clear definitions so that they do not become misused in political debates and, in effect, become junk science used to support a particular policy position.

Rule 6 – *Concede that societal values and priorities evolve*

It was not many years ago that many current wildlife icons, such as cougars, bears, and wolves, were viewed as nuisances to be expunged from the land. Much of society now has a different view – a conviction that, far from being earmarked for eradication, these species ought to be tolerated, even protected from humans by the force of law. Neither the view that cougars, bears, and wolves are pests, nor the view that they are valued life forms to be protected, is "correct" scientifically, but they lead to dramatically different political positions.

Salmon technocrats today work in a different "rights culture" than did their predecessors. Concepts of rights have changed, often dramatically. Human rights and property rights, at least in western North America, have meanings that are distinct from those a century ago. Not surprisingly, clashes between the rights of individuals and those of the larger society are often resolved differently at different points in time.

It is certain that salmon technocrats a century from now will deal with societal values and priorities as different from today's values and priorities, as today's values and preferences are different from those a century ago. None of the values in 1900, 2000, or 2100 is more "correct" than the others; they are simply different.

Society weighs policy choices in the context of prevailing values and preferences. Even with identical scientific information and the identical condition of stocks, a salmon policy position from the end of the nineteenth century doubtless would be different than a current policy on salmon.

The search for the scientifically *optimal* policy solution will be futile because of changing values and preferences. The sooner that a salmon technocrat accepts this

rule, the easier it will be to survive the ebb and flow of salmon policy debates.

Rule 7 – Avoid technical and scientific hubris

Many salmon technocrats suffer from a severe case of technical hubris. But before we become too enamored with our own ability to solve salmon problems if only society would follow our advice, let's look at our record.

Some of our predecessors heralded hatcheries as the solution to dwindling salmon runs to the detriment of wild salmon. Still others fostered something called "scientific management," which purported to be the solution to the wild salmon decline problem. We had other fixes, too: computer simulation and modeling, benefit/cost analysis, habitat improvement, and complicated harvest restrictions. All have their positive features, but none solved the wild salmon decline problem.

If you think you have uncovered an innovative technological fix for the salmon problem, examine our track record for the past century: it is wretched.

Cautions

Most individuals interested in salmon policy are not salmon technocrats. From their perspective, a reasonable question is: "how should I deal with salmon technocrats in order to make best use of their expertise?" It is a perfectly reasonable query, but one not often asked and rarely answered.

First, do not tolerate happy talk from salmon technocrats. None of us likes to be the bearer of bad news. It is only natural that salmon technocrats search for the silver lining, the good news, in what some would classify as a bleak message. My recommendation is not to be lulled into such displacement behavior, but to describe scientific information and policy options the way they are, not the way you might wish them to be.

Second, demand that salmon technocrats speak bluntly and clearly. Most of the technical and scientific issues in salmon policy are not difficult to understand at the level required for policy decisions. Salmon technocrats should be forced to limit esoteric scientific discussions to scientific discourse, not extend them into policy debates.

Third, recognize that the policy choices are tough and that salmon technocrats, at least the honest ones, will not have an easy, painless answer. The expectation of finding a magic solution is futile.

Fourth, be cautious with "scientists for rent." Scientific information can be used to favor any particular policy option, or undermine those of rivals. In reality, scientific information can clearly be used to show that a particular policy option has a low chance of success, but scientific information does not inherently support any policy option.

Finally, be wary of salmon technocrats offering policy positions under the guise of science. Many salmon technocrats have strong personal views on salmon policy, but these views are personal, not scientific. Embellishing such personal views with the language of science adds a deceiving veneer of credibility.

The Future

Regardless of society's decisions, the debate over the future of wild salmon in the Pacific Northwest is a promising development in public policy. The future of wild salmon is now debated on the front pages of the region's newspapers. People appear to recognize that the issue is one of tradeoffs – very difficult tradeoffs. The policy debate now appears to be, appropriately, less about technical and scientific nuances and more about choices and options.

The role of the salmon technocrat in salmon policy will remain challenging. By following the rules I have proposed salmon technocrats can provide the necessary and appropriate science, but leave the debates over values and tradeoffs in the public arena where they belong.

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Biographic Sketch

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.
