

# Scientific Assertions that Muddle Ecological Policy<sup>1</sup>

## Robert T. Lackey

Department of Fisheries and Wildlife  
Oregon State University  
Corvallis, Oregon 97331

**Voice:** (541) 737-0569

**Email:** [Robert.Lackey@oregonstate.edu](mailto:Robert.Lackey@oregonstate.edu)

**Web:** <http://fw.oregonstate.edu/About Us/personnel/faculty/lackey.htm>

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## Introduction

Thank you so much for that kind introduction. I do appreciate the opportunity to attend the 58<sup>th</sup> annual Great Lakes meeting and, especially, for the chance to touch base with some old friends.

But right now I am here to do a job. So let me start by sharing with you some inside information about how this talk actually came to be.

Tell me, how would you react to an invitation from a program organizer that was pitched this way? And I'm quoting:

*"At these meetings, we are mostly scientists who pretty much listen to each other talk, ask a few predictable questions, then move on to the next topic. We are more or less always on the same page. We want you to tell us something we need to hear, something provocative, something challenging, something stimulating!"*

OK, scientists! Here's a flash, unless you have an ego the size of a daphnia, I'll bet you would readily accept such an invitation.

As did I.

Great! That decision was easy, but should I say? What do you need to hear? What would be provocative? What might challenge you?

How about the notion that science should play the dominant role in politics? That would be safe and reassuring, at least to us scientists.

Ah, but you wouldn't believe it.

Or, perhaps I could focus on the specific, something about the type of information demanded by old-time radio and television Dragnet detective Joe Friday. For those of you not old enough to remember my childhood hero, Detective Sergeant Friday, the most famous quote attributed to him was "just the facts, ma'am."

No political spin, no advocacy, no irrelevant details, just scientific facts and their probabilities. Simple, straightforward, and honorable; the idealized world of science that we all heard about long ago in Biology 101.

I liked that idea, and I did spend time pondering how to best present this noble, this classic vision of the role of scientists in public policy. And I ran some early ideas by one of my more reflective graduate students, someone who I knew would be supportive because he hadn't yet been immersed in the "less pure" aspects of the scientific enterprise.

As only an idealistic and passionate young scientist would say:

*"Dr. Lackey, things have changed since you were a graduate student. You are living in a dream world. Most of the public just assumes we are policy advocates. These days, the only people who really trust scientists — are scientists themselves. You need to get real!"*

Is this the breed of scientist our universities are now producing? Scientists who see themselves as members of a policy advocacy group? Is this what scientists have become in the U.S.? In Canada?

I would normally easily dismiss such a judgment, especially one coming from a naive graduate student, but I well remember a scolding I received from a very experienced career Government lawyer. And, it is not a pleasant recollection, even after many years.

We were relaxing in a pub after spending a long, long day listening to dueling scientists testifying in an Endangered Species Act trial. I was trying to convince him, a lawyer, from my perspective, a scientist, that it seemed reasonable to expect the opposing sides to at least be able to agree on the basic science relevant to this particular court case, or, as Joe Friday would demand: just present the "scientific facts."

After all, the legal debate should be over interpretations of the law, not the science, right? My argument seemed pretty indisputable to me.

In retrospect, perhaps I was badgering him a bit too much, but his response stunned me:

*"Bob, you guys have no credibility. All of you spin your science to lend support to whatever policy outcome you or your organization favors. I'm not sure science was ever a beacon of truth, but it sure isn't now, at least not in the legal arena. I watch scientists routinely misuse science in case after case."*

OK, that's it, a naive grad student and a jaded lawyer on the same page — time to concede. Perhaps I was suffering from a case of delusional reality. The credibility of scientists is being challenged, and it is being challenged by a broad swath of the public.

Pick your favorite current policy issue, changing climate, fluoridation, genetic engineering, endangered species, vaccinations, evolution, the Keystone XL pipeline, fisheries management, much of the public no longer trust scientists to present “just the facts” as Joe Friday demanded.

From my experiences in government, academia, and the private sector, suspicions about the motives of scientists have less to do with some grand conspiracy theory than what some scientists have actually said or written — and who pays their salary.

For example, remember the Climategate email controversy, the leaked or hacked emails written by university and government scientists. Yes, to us scientists the emails were very embarrassing because they exposed the seamier side of how science is sometimes done.

More interesting to me though was that most of the subsequent discussion in the scientific community was about reassuring ourselves, and the public, that the basic science involved was not undermined and so, oh well, no harm, no foul. No big deal, right?

But think about how these emails played to an already skeptical public.

Here's a specific example. In one of those emails, written by a well-known university scientist, a scientist funded by taxpayer dollars, and after his employer had received a formal request to provide copies of certain emails as required by that country's version of the Freedom of Information Act, this scientist actually suggested (by email) that his collaborators delete any emails dealing with the same subject.

Amazing! Asking colleagues to delete emails that have been, or likely will be legally requested? What was there to hide? Wouldn't a reasonable person be at least suspicious about the motives?

No wonder many people, everyday people in the real world, have come to view scientists collectively as simply one more political advocacy group.

To those of us who are scientists, to those of us who teach would-be scientists, if we don't like this situation, and I don't, we need to clean up our act.

I challenge each of you to look in the mirror and identify things that you might have done to exacerbate this sorry state of affairs.

As a first small step in restoring the credibility of the overall scientific enterprise, I propose that we jettison three assertions that muddle ecological policy. These three assertions are widely taken as self-evident truths by a good number of graduate students, by many of my colleagues, perhaps even by a few of you.

### First Scientific Assertion

The first scientific assertion that should be jettisoned is:

**“Science is the key to resolving ecological policy disputes.”**

Yes, this common assertion is wrong. Science is rarely the key to resolving ecological policy disputes.

But, how often have you heard this lament from scientists:

*“If we just had better science, or at least more science, more data, the best policy choice would be obvious and we could move on. It is a lack of science that is the main obstacle to deciding what to do.”*

This lament is often followed by a proposed course of action:

*“Fund us and we’ll provide you with the necessary scientific information to make for an easy decision!”*

I know. I’ve followed this script many times in the never-ending search for research funding. Have you?

Here’s my confession. When I was working as a research scientist at the Environmental Protection Agency, part of my job was to convince the EPA regulatory people that their main problem was really a lack of scientific information. You know the marketing pitch: send money, you’ll buy more science, and more science will solve your policy-making problem.

To prosper these days, a research scientist must play this game and play it well. More money means you can hire additional staff, buy better equipment, publish more papers, and ascend the scientific pecking order.

But the fact is that science rarely drives policy debates, at least not policy debates that people care much about.

Let me illustrate with an example of how more science actually muddles a policy debate. It is an example from far away, a case study that you can analyze with detachment and comfort, but one that illustrates what has become ever so typical in ecological policy.

Think about my part of the world, the Pacific Northwest, Oregon, Washington, Idaho, and British Columbia. For three decades, there has been a highly polarized debate over what the primary purpose of the publicly owned forests should be.

Simplifying this complex policy debate down its core question:

*a) should these public lands be managed for sustained timber production to foster economic development generally, and for rural communities, specifically?*

*or*

*b) should these public lands be preserved for nonconsumptive uses such as recreation and species protection that primarily benefit urbanites?*

But what have you read about? About the plight of the northern spotted owl, right? An at-risk species that almost no one, even most enviros, cared much about prior to its selection as the species of choice to trigger the Endangered Species Act.

Even more bizarre, the major political debate over choosing between two competing, and legitimate, policy goals collapsed into endless court cases revolving around the most esoteric life history details of this obscure species.

No wonder much of the public has become cynical about the political process — and the role of science.

Some policy advocates, especially those pushing to stop logging on public forests admit, at least in private, that selecting a charismatic species was a tactic to awaken the substantial legal power of the Endangered Species Act. In short, the “scientific facts” about spotted owls became a legal weapon, a surrogate, used by advocates to achieve their primary policy goal, to stop logging on public forests.

Conversely, other policy advocates, especially those promoting logging to support rural communities economically and meet domestic demand for lumber and paper, pitched science in a way that supported their policy goal, to allow logging on public forests.

Great for policy advocates, they are free to use whatever tactics or tools work in policy debates, but for the credibility of scientists in the eyes of the public, it was very costly.

If somehow we could miraculously and instantly learn everything possible about spotted owls, the policy debate would still continue because science has simply become a weapon in the larger policy war.

## Second Scientific Assertion

Now let's move to a second scientific assertion that needs to be hauled to the nearest landfill, and the sooner, the better:

**“Natural ecosystems are superior to human altered ones.”**

Who says that natural ecosystems are superior to human altered ones?

This assumption is so pervasive, so commonplace, that some scientists just take it as a self-evident fact.

Perhaps even some in this room.

Let me illustrate how this assertion actually plays out in the scientific enterprise.

From the perspective of a scientist, think about the question of whether or not to dam a river to produce electricity. There is absolutely nothing in science that implies that an undammed river is more, or less, valuable than that same river dammed to generate electricity.

Free flowing rivers, and dammed rivers, are different ecologically, most definitely different, but neither is better or worse until a policy preference is endorsed, until a value judgment is applied.

Applying value judgments, choosing between competing policy preferences, is beyond the scope of science.

But is it common for science to be biased toward the unaltered state of ecosystems, toward natural? Most scientists will answer unflinchingly “no way” — or perhaps “well, at least not my science.”

Let me counter with some data.

For many years, I have surveyed students who take my graduate level policy class. They complete a survey on the first day of the term, a survey to determine inherent policy bias. The result?

There is absolutely no question that, among these students at least, all with bachelor's degrees and many with master's degrees in some field of science, there is a strong feeling that natural ecosystems are inherently superior, just somehow better than human altered ones.

Further, most of these students describe unaltered ecosystems as "healthy" and highly altered ecosystems as "degraded." The implied conclusion: a "healthy" ecosystem is clearly in better shape than a "degraded" one. And further, human alteration is a bad thing, perhaps necessary for providing food or shelter, but still not really a good thing.

Therefore, my conclusion, the term ecosystem "health" presupposes that natural is preferred to human altered. But, and we scientists need to remember this, whether society wants a fish community dominated by Chinook salmon and alewives, or one dominated by lake trout and ciscoes is a policy choice, informed by science, yes, but a policy choice nevertheless.

To say an ecosystem is healthy, or degraded, implies an embedded policy preference and thus is not real science. It is normative science.

Normative science does have the facade of regular science, but it has an assumed policy preference, a hidden policy preference, a stealthy hidden policy preference.

For example, in science, why is it that native species are almost always considered preferable to nonnative species? Nothing in science says one species is inherently better than another, that one species is inherently preferred, or that one species should be protected and another eradicated.

To illustrate, why do most people lament the sorry state of European honeybees in North America, a nonnative species that has outcompeted native bee species? Yes, our honeybees are nonnative, what many people would label as an invasive species, but people value their ecological role.

Conversely, zebra mussels, another common, but nonnative species are nearly universally regarded as a scourge. Where are the advocates of this species? Even with increased water clarity, no cheerleaders.

Or, what about North American feral horses — wild horses — mustangs! This is another nonnative species, but one that enjoys an exalted status by many. Would you want to be the land manager tasked with culling the ever-expanding population of this invasive, nonnative species?

Values drive these categorizations, not science.

### Third Scientific Assertion

The third scientific assertion that needs to be tossed in the rubbish bin is:

**“The values, that is, the policy preferences of scientists, are special.”**

They are not.

Yes, science is one of several types of information, and it can and should be valuable in policy making, at least in my opinion.

But clashing values, clashing policy preferences in the jargon of political scientists, are typically at the core of policy debates. And the policy preferences of scientists are no more important than those of non-scientists.

To lose sight of this fact is to undermine the credibility of the one thing we scientists can uniquely contribute to policy debates: providing policy-neutral science that allows others to focus on debates over which values and which preferences will win out.

When scientists step outside the bounds of science, our only area of special expertise, we should remember the admonition of Richard Feynman, sometimes described as a scientist's scientist:

*“I believe that a scientist looking at nonscientific problems is just as dumb as the next guy.”*

And, there is a real price to pay when scientists slip into policy advocacy and overtly, or covertly, push policy preferences.

For example, think about the unrelenting policy debate over what should be done, or can be done, about a warming climate.

Nearly everyone is aware that climate changes over centuries and millennia. Changing climate is the norm, not an aberration. People know this intuitively.

For example, there is little question that today's temperatures are higher than they were 150 years ago. After all, the planet 150 years ago was emerging from the Little Ice Age, a relatively cool period from around 1400 to 1800. And before the Little Ice Age was the Medieval Warm Period from around 900 to 1300. Old news for sure.

But the policy relevant scientific debate is over how much of the current warming is due to human actions. This is where the political dynamics of the scientific debate get interesting.

It is ever so easy for us technocrats, for scientists, to take comfort in the view that:

*“If only they understood the science, they would appreciate the seriousness of the political debate. We scientists need to explain it again, but with simpler words this time.”*

But which scientists to trust?

Presumably the public can trust scientists employed by government agencies and ministries, right? At least their policy preferences should not color their science, right?

Before you so quickly place government scientists among the angels, imagine that you are the ordinary Joe or Jane Citizen trying to figure out which scientist to trust about the degree to which humans have caused the observed warming.

OK, tell me what you, the average citizen would think when you hear the following from senior government officials, individuals who have influence over which government research programs and which government scientists get funded.

This is one of those times when holding dual citizenship helps!

For you Americans, consider this statement from a senior official in the Department of State:

*“We’ve got to ride the global warming issue. Even if the theory of global warming is wrong, we will be doing the right thing in terms of economic policy and environmental policy.”*

But, you Canadians out there, I am also one of you, we should not be entirely complacent.

Imagine that you are an average member of the Canadian general public and you hear the following statement from the Minister of the Environment:

*“No matter if the science is all phony, there are collateral environmental benefits . . . Climate change provides the greatest chance to bring about justice and equality in the world.”*

What conclusion would the public draw about the policy neutrality of science funded by government when they hear these kinds of statements from senior leaders? Wouldn't the average person be at least somewhat suspicious about the impartiality of scientists working for these organizations?

OK, another confession, my naïve grad student was right after all. At least for many people, scientists are perceived as just one more political advocacy group. Even more disconcerting, I understand why.

## Conclusion

Let me wrap up with a quote attributed to the late New York Senator Daniel Moynihan:

*“Everyone is entitled to his own opinion, but he is not entitled to his own facts.”*

And facts, including probabilities, are what the public and decision-makers need from scientists, not pushing our personal opinions about what policy option should be chosen, nor stealthily advocating in favor of our employer's policy preferences by slipping into normative science.

One thing that scientists must bring to the political dynamic is a blunt recognition that nothing in policy making is free. This contribution, this reality check, is often not welcome. In fact, scientists who push this reality too forcefully are often ostracized, but there are ecological, economic, and societal consequences associated with all policy options.

Policy “win-win” only exists in the sham arguments pitched in election year political campaigns. Every policy choice involves winners, and losers. There are no free lunches, an inconvenient truth for sure.

To policy-makers, I say: science is important in helping you understand the likely consequences of each policy choice, but it is only one of many inputs. Choosing from among competing values and priorities is what you do. Don't use science, and scientists, to evade this difficult, often unpleasant, and frequently contentious responsibility.

And finally, to scientists, I say: be fully engaged, but stick to science — tell the truth — tell the whole truth. It may be uncomfortable, it may be unpleasant, it may be unappreciated, but scientists should strive to be unimpeachable providers of facts and probabilities.

Nothing more. Nothing less.

Thank you.

## About the Speaker

*Dr. Bob Lackey is professor of fisheries science and adjunct professor of political science at Oregon State University. In 2008 he retired from the Environmental Protection Agency's research laboratory in Corvallis where, over a 27 year career, he served as Deputy Director and in various other senior science and leadership positions. Since his very first fisheries job as an undergraduate, mucking out raceways in a trout hatchery, he has worked on an array of natural resource issues, mostly at the interface between science and policy. He has published over 100 articles in scientific journals and authored or edited 5 books. Dr. Lackey has long been an educator, having taught at 5 North American universities. He continues to teach a graduate course in ecological policy at Oregon State University. A U.S./Canada dual citizen, he was a Fulbright Scholar at the University of Northern British Columbia during the 1999-2000 academic year. Dr. Lackey holds a Doctor of Philosophy degree in Fisheries and Wildlife Science from Colorado State University and was selected as the 2001 Honored Alumnus by their College of Natural Resources. He is a Certified Fisheries Scientist and a Fellow in the American Institute of Fishery Research Biologists. In 2008 he was awarded the U.S. Environmental Protection Agency's highest honor — the Gold Medal — for exceptional contributions in strengthening the role of science in ecological policy.*

**Web Site:** <http://fw.oregonstate.edu/About Us/personnel/faculty/lackey.htm>

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