

Keynote Session – The Endangered Species Act and Related Natural Resource Issues

Welcome to Conference and Introduction

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What do we hope to accomplish with this conference?

- We want to inform managers that are making very critical decisions right now on a whole host of issues we're working on.
- We want to inform citizens and help all of us understand what the basis of scientific knowledge is about the natural resources, and how we can protect them better.
- We want to share scientific information among researchers – from students to tribal members who are doing research in watersheds to local governments. It's the whole mix of agencies and academics that makes our understanding of Puget Sound much, much richer and broader, and this is one conference that brings all of you together.

We also hope that the conference can help us identify emerging issues, and I think our first panel this morning is going to identify what one of those big emerging issues is now, one that we've all been hearing about on the news recently: the proposed Endangered Species Act listing of salmon stocks in Puget Sound.

I urge all of you to participate in the conference by asking questions and staying focused. It's going to be a pretty intense two days, running well into the evening tonight. To get your time and money's worth and for us to understand all of the issues that are on your mind, we encourage not only your questions during the sessions, but also cornering people in the hall or talking over meals, and then staying connected after the conference. I think we all appreciate that a lot of the real value in a conference is meeting the person that's doing parallel research to yours but that you've never met before, or talking to a newspaper reporter about how we can explain the scientific understanding better.

Let me introduce our moderator for this morning's keynote panel, Bob Edwards, who is a City Councilman in Renton and also on our Puget Sound Council. I think Bob is the exact right person to talk, in an initial way, about what the Endangered Species Act (ESA) means to him as a local official and to introduce the rest of the panel. So with that, Bob, I'll turn it over to you.

A Local Perspective on Puget Sound Salmon Endangered Species Act Listings

Bob Edwards

Renton City Council and Puget Sound Council

Thank you, Duane. I'm not sure about being "the exact right person" or any of the rest of it, but thank you for the kind words. I do serve on the Puget Sound Council, which advises the Action Team on policy issues, and also on the Renton City Council. I'm also a member of the board of the Association of Washington Cities as the immediate past president, so I communicate with other city council members and mayors from around the state.

We've dealt with many problems in Puget Sound over the last decade, but the approach has been largely voluntary, and that certainly fits with a lot of what we in local government believe and strive for. We tend to resist and have an aversion to mandates. And certainly the Endangered Species Act (ESA) is something that has more of a look and feel of a mandate. The ESA brings a stronger presence and a need to be accountable for salmon stocks in the Puget Sound basin. Local governments know that the threat is real and that it will be costly. We do want to respond, but there is a lack of detail right now and that causes concern.

I was just back at the National League of Cities where a group of elected city officials from Washington State met with our congressional delegation. In the meetings that we had with both our Senators and, the one I attended, our Representatives, one of the top subjects that came up was the ESA and the listing of the Puget Sound Chinook salmon. There is great deal of fear and trepidation, I think, among elected officials. Partly, it's caused by the fact that we feel like there needs to be a road map for how we're going to get from where we are to where we need to be and no one has a lot of confidence that there is that road map.

The types of questions that have come up are: How high will the bar be for restoration and habitat protection, considering what we've been doing for a decade? How much counts for meaningful restoration and for a habitat conservation plan? The question that often comes up is, "Do we get credit for what we've already done?" Unfortunately, I think everybody knows that that's not quite the way it's going to work.

We're honored to have a panel today of distinguished leaders from the federal agencies that have major responsibility for implementing the Endangered Species Act and the Federal Clean Water Act. We have with us Will Stelle, the Regional Administrator for the Northwest Regional Offices of the National Marine Fisheries Service, and also the EPA's Region 10 Administrator, Chuck Clarke, who also serves on the Puget Sound Action Team. We have with us Robin Waples of the National Marine Fisheries Service who is the father of ESU's—evolutionarily significant units—and who will also explain the status of Puget Sound salmon stocks and how far we have to go to build back these critical runs.

After we hear from our panel members, we want to open this up for questions. This is how we're really going to be able to share information. So I'd like you to please help me welcome the esteemed panel, beginning with Will Stelle, followed by Chuck Clarke, and then Robin Waples.

Salmon Habitat—The Endangered Species Act and Some Points of Intersection with the Clean Water Act

Will Stelle

Regional Administrator, Northwest Regional Office, National Marine Fisheries Service

Thank you, and I'd like to thank Nancy, Duane, and the organizers for the invitation to appear here before you this morning. What I'd like to try to do this morning is three things, which is always ambitious. The first one of which is to simply describe to you the basic mechanics of the federal Endangered Species Act. The second is to describe to you our approach to the issue of habitat and how do we analyze whether habitat is good habitat or not. And the third is to discuss a little bit of the potential points of intersection between the federal ESA and the federal Clean Water Act (CWA).

We have described evolutionarily significant units (ESU's)—clusters of salmon runs—which either have been listed or are proposed for listing or are candidates for listing under the ESA. I won't go into the details here but to offer the following basic point. These ESU's cover a huge geographic area. This is the Western United States, and probably by the end of next year when we complete our chinook reviews, there is a pretty good likelihood that we will have final salmon runs listed under the ESA from the border of British Columbia down to Los Angeles. The geographic scope of this challenge is probably one of the most salient features of it. Don't forget this map.

First, the basics of the ESA. In Section 4 of the ESA are the authorities for listing and rulemaking under the act. Once species are listed, then the obligations to conserve under the ESA kick in. Those obligations are contained in Section 7 of the Act, which describes what federal responsibilities are. There are obligations, described in Section 9 of the Act, which tell everybody not to "take" endangered species. There is authority to permit activities under Section 10 of the Act. Finally, I will go over areas of overlap with the Clean Water Act and the benefits of trying to pull those two statutes together.

First of all, the listing process. You've probably seen a lot of this in the news. It's a fairly orderly and routine and sophisticated process. Step one is to identify the proper clustering of neighboring salmon runs based on the concept of ESU's, evolutionarily significant units. Dr. Waples, on the panel here, was the principal author of that and I suspect he'll spend a little time this morning discussing its details.

Once we identify what the proper listing units are, we have to assess the risks that an ESU may be at risk of extinction now or in the foreseeable future based on abundance, trends and genetics of the populations within that ESU. Then we assess the extent of state or local conservation efforts to reduce those risks. We are obliged under the law to use the best available science in making these judgments. We share our technical assessments with state and tribal co-managers as we complete them.

Once a species is listed, Section 4 confers upon the agencies the rulemaking authority to apply “take” prohibitions to endangered and threatened species and to promulgate such other rules as may be necessary and advisable for the conservation of these listed species. The point I raise here is that this authority to promulgate rules is very broad and very flexible. Whatever rules are necessary and advisable. There’s not a lot of guidance there.

OK, let’s assume we have listed species. Let’s assume that they are listed as threatened under the ESA. What happens? First of all, the protective obligations of Section 7 kick in for federal agencies. The scope of that obligation is that it applies to all federal actions including licensing, permitting approvals, funding, as well as managing federal assets such as federal lands and federal hydropower projects. So it’s not just what the feds own, it’s also what they permit and license. The substance of that obligation is that the federal agencies are to exercise all of their authority in furtherance in the purpose of the ESA, and the purpose of the ESA is to eliminate the risks that may cause species to go extinct. Suddenly that obligation to conserve species is an enforceable obligation against all federal agencies. This is a very, very powerful obligation.

There is a strict prohibition upon any federal action that may jeopardize the continued existence of listed species or modify their critical habitat. The procedure by which you determine whether a federal action may be jeopardizing, or whether or not you’re properly exercising your authorities to conserve, is consultation with us at the National Marine Fisheries Service or with the Fish and Wildlife Service. They have biological expertise under the ESA to determine what those species need and to determine whether a proposed action is OK or not. If it’s not OK, what terms and conditions, what changes they must be made in the proposal in order to minimize risks to the species? The recommendations that we make on how to change federal actions are very nearly binding on the federal agencies. So the Section 7 consultation process by which we advise federal agencies on how to change the way they normally do business is a very powerful tool: the most powerful tool of the ESA.

The prohibitions against jeopardy apply to federal land managers in fresh water habitat, federal dam operators, like the Corps of Engineers and the Bureau of Reclamation. Permitting licensing and funding activities of for instance, the federal Energy Regulatory Commission, the Environmental Protection Agency, the Corps of Engineers, the Natural Resources Conservation Service, the Department of Defense, the Federal Emergency Management Agency, and the Department of Energy, to name a few. Again, this is just to give you the flavor of the scope of the obligations.

There are conservation obligations under the ESA that apply to non-federal agencies as well. They apply to all public and private activities: what you and I do. The substance of the obligation is that the ESA prohibits any actions that result in “take” of endangered or threatened species, unless those actions are exempted by incidental take permits, or special 4040 rule, which I described earlier on. “Take” is defined to encompass the activities that cause death, harm, harassment, or significant habitat modification that are highly likely to result in harm. The procedure by which these take prohibitions apply is automatic, which is to say they apply to you automatically. We don’t have any specific consultation or advisory roles to describe to you what you can and can’t do. Activities that constitute take are subject to civil and criminal penalties under the ESA.

As applied in the context of salmon, these take prohibitions may apply to dam operations which kill fish, freshwater habitat activities including forestry, agriculture, irrigation and water resource management, fishing, and hatcheries. Let me emphasize, though, that this take prohibition requires a high standard of proof. It’s not just any old modification of habitat. One needs to prove that there was substantial habitat modification, so substantial that it did or will result in killing fish or altering their behavior. This is not an easy thing to prove. It’s a hard thing to prove. But it’s also a very powerful prohibition.

The ESA under Section 10 also authorizes us to permit take pursuant to habitat conservation plans whereby an entity may propose a long term set of activities, say land management activities, which we believe will improve conditions for salmonids and will provide support for their continued existence on that habitat. We, in turn, can approve those plans, and that approval carries some insulation from potential take liabilities under the Act. The scope of habitat conservation plans can embrace any activity or group of activities that may result in the taking of listed species. The obligations of these habitat conservation plans are to minimize and mitigate take to the maximum extent practicable, and to contribute to the long-term survival of species within the proposed activity.

The duration of typical plans that we have been working on over the past one to five years, largely with the large industrial landowners here in the Pacific Northwest, range from 50 to 75 years. They tend to be multi-species, they are not just for salmonids. They tend to cover all species that are or may be listed under the federal ESA, both aquatic and terrestrial.

These plans result in stability for the entity that has received approval. That entity, be it a land owner or a county, so long as they are implementing the plan as approved, will not be subject to further take prohibitions. They will not be subject to lawsuits, and if they are, that the U.S. government will defend with them against those lawsuits. These habitat conservation plans are a very, very important tool.

Now let me turn to the second topic I wanted to raise to you today which is, how do we think about habitat? Our fundamental objective under the ESA as it relates to Pacific salmon and the habitat of Pacific salmon is to seek properly functioning habitat conditions to support salmon populations. When we look at an action to determine what its effect will be on habitat, we identify whether that action is likely to impair properly functioning habitat, further damage impaired habitat, or retard the progress of that habitat. Again, their reference point here is properly functioning habitat. Properly functioning conditions (PFC) are defined, are to consist of sustained natural processes, not static characteristics. PFC is attained when a watershed's habitat forming processes (i.e. riparian communities, succession, bedload transport, run off patterns) function to maintain a healthy aquatic ecosystem over time. PFC is necessary for the long-term survival of Pacific salmon.

Now here are some of the ways in which we evaluate or assess PFC. We have what we call pathways and indicators. The pathway, and this is again by way of an example, the pathways are water quality, habitat access, habitat elements, channel conditions and dynamics, flow and hydrology, and upper watershed condition. Indicators, then, are at a higher level of specificity. Things that may affect that pathway of water quality include temperature, sediment, turbidity, chemical contamination, etc. Those things that traditionally encompass water quality concepts under the federal CWA. I'm not going to go through this list overall, but it'll give you a feel for it.

Again, in assessing whether or not those pathways will be achieved or are going to be provided for, we try to develop ranges of those individual indicators, whether or not it's properly functioning, at risk, or non-properly functioning. And again, this is intended to give you an example of how we evaluate whether or not a particular stream or a particular habitat segment is healthy, is properly functioning or not. And if not, why not and to what extent?

Going to my third point, our major thesis is that federal and state ESA and clean water agencies should marry their respective programs to conserve the aquatic habitat for ESA listed salmon, and to meet state and tribal water quality standards. To coin a phrase, this should be killing more than one bird with one stone. One-stop shopping. The objectives of ESA and Clean Water Act integration: effectiveness of achieving program goals, either aquatic health or water quality; state and federal efficiencies (one-stop shopping for the public); and flexibility in compliance at the watershed scale. Most of these are fairly self-evident.

The major points of overlap of the CWA and the ESA: First of all, they have the same purposes as applied to aquatic systems and Pacific salmon. The purpose of the CWA is to protect the physical, biological and chemical integrity of the nation's surface waters. The purpose of the ESA as it applies to Pacific salmon is to conserve Pacific salmon and the ecosystems upon which they depend. If you're a fish, the concept of water quality under the CWA and the concept of a healthy aquatic system under the ESA are the same thing. And if they're not the same thing, something is wrong. There is a geographic

overlap. Here in the states of Washington, Oregon, California, and Idaho we have major con-compliance problems with the federal CWA, which Chuck will describe to you, and they are largely coterminous geographically with the ESA salmon listings. There is a technical overlap in water quality and aquatic health concepts and parameters. There should, and can, be overlaps in the regulatory machinery. The key issues in achieving this integration are to align the ESA and CWA objectives and to align the technical parameters for achieving those objectives, what I have described here as PFC.

Now, finally the practical constraints in doing this: time, money, and people at federal and state regulatory agencies. We're all badly overworked, and this is just one more item that will land on our collective plates. Variable state commitments at the DEQ levels. The state departments of Ecology or Environmental Protection are the principal focus for responsibility for complying with the federal CWA. These are delegated programs. So if the state agencies are not prepared to play, it will not work.

Thus far I had been mightily impressed in how uninterested the regulated community is in putting these two regulatory regimes together. I'm not quite sure why, but, again from my perspective, one-stop shopping makes a lot of sense. And then there's general inertia and risk-averse cultures in all of our various venues. Change is hard. Change requires a lot of effort on the part of all, and it doesn't come simply. We have traditional ways of doing business in the federal and state agencies. Permittees have traditional ways of doing business. Lawyers have traditional ways of doing business. And we will need to change those traditions if we are going to achieve the objective of marrying both the CWA and the ESA compliance here in the Pacific Northwest. With that, I'd like to stop, and again, I thank you for the opportunity to talk to you here this morning and look forward to your questions.

The Clean Water Act Now and into the Future

Chuck Clarke

Regional Administrator, Region 10, U.S. Environmental Protection Agency

Thanks, Will. I will try to do this rapidly to try and leave you some time for questions. I apologize for my voice. It's fading. I've been fighting a bug for the last three or four days and I think it's finally starting to win. I will try to get through this without losing my voice.

I'd like to start with a context piece. If we look at Will's charts of ESU's that are listed or proposed for listing under the ESA overlain with the streams and rivers in Idaho, Oregon, and Washington that currently do not meet water quality standards, you will note a lot of consistency between the ESA problems being experienced throughout Washington, Oregon, and Idaho and stream-water-quality conditions that have created some of those problems.

With this as background, I'm going to talk about two things today: (1) where are we today related to the Clean Water Act (CWA), and (2) where we need to go tomorrow to deal with some of the issues we face.

In many ways, when Will got up here and talked to you about the ESA, it reminded me a lot, after having worked at the state level for a long time, about the corrections debate that goes on within the states. The way that people have dealt with corrections issues, criminal issues, over the last five or six or seven years is to build a lot more prisons. It is a mechanism that looks at the back end of the problem, not the front end of the problem.

ESA in many ways is very similar. If we haven't done a good job at water quality standards and we haven't done a good job at managing and making decisions related to the environment, we end up being subjected to the ESA. It is a reactive, at best, approach to dealing with it. It is an approach that, in many ways, will never allow us to go back and attain what we've lost historically because of the actions we've taken. As in many instances, you're trying to do through ESA the best job that you can, by not losing any more, and maybe gaining a little bit back where you can. I think it shows that, although we've made a lot of success in clean water in this country over the last 25 years, we have not made enough, and we need to look at doing things in a different way than we have in the past.

The CWA debate is shifting after 25 years. It's shifting from what was the debate in the 1970's over technology-based standards vs. ambient standards. We chose, in this country, to go to technology-based

standards because we couldn't figure out how to deal with ambient standards because there was too much science involved. We didn't understand it very well, and so we said let's just look at the end of the pipe, and let's look at sources and tell people what they can discharge, and that will be an easier way of dealing with clean water. Now we're saying, gee, we made some progress, but it wasn't enough. And we have to look at the ambient conditions of the environment and decide how best we need to deal with water quality.

We're moving from point sources to nonpoint sources. The marginal costs of continuing to ramp down on point sources are getting higher and higher and higher. We have achieved a lot of successes. There still is some room for some additional gains, but the big gains before us are dealing with nonpoint-source pollution, and that means that we must move away from the kind of point-source orientation of industries and municipalities to dealing with agriculture and silviculture and a lot of the things that we all do as private citizens in the way we live, where we live, where development occurs, how we manage our transportation, how we deal with pesticides, how we deal with fertilizers, how we deal with all those issues that contribute to nonpoint source problems. We're fundamentally at that crux right now of trying to move off of the traditional approaches in the dealing with the nonpoint sources. It is an extremely difficult issue for regulatory agencies.

People in this country believe that they are environmentalists. If you do polling, 80 percent of the people in the country believe they are environmentalists. If you ask them questions about what they want to do to protect the environment, they say go out and enforce against municipalities and industries, and by god, we're behind you 100 percent. But if we say, "Well, how about if you do something," their will power rapidly declines. If you look at some of the national polling data, when they started looking at wetlands issues as a definition of a commitment to the environment, people started becoming much more interested in their personal property rights than they did in the environment. When we asked the questions about going out and hammering on an industry, they got real excited again. So I think it is going to be a difficult issue over the next decade in trying to figure out how to deal with nonpoint issues because they are not easy to define.

There are a number of legal decisions that have occurred over the last few years that are putting some pressure on the CWA to change the way it does business.

The first issue relates to water quality standards. Let me give you a very simplified version of how the legal issues of water quality standards are changing. The EPA in this region is involved in four states: Washington, Oregon, Idaho, and Alaska. We have now lost lawsuits in four states—Washington, Oregon, Idaho, and Alaska—on how we have managed the CWA, and more specifically water quality standards, over the last 15 years. We have been put in a position of having to redefine how states address their water quality standards, and how they bring water body segments that don't meet water quality standards back into compliance with the standards.

Every two years the states take all the water quality data that they have on all their stream segments in their state and make determinations of what waters meet or do not meet water quality standards. As a result of this work they publish the 303(d) list. This is a list of all water body segments in the state that don't meet water quality standards. After that list is compiled, the states have to develop a strategy for every one of those segments on how to bring it back into compliance with the water quality standards.

Because of the court cases that the EPA has lost in the Pacific Northwest, the EPA is now on the hook to make sure that states develop and implement the strategies for bringing waters back into compliance with water quality standards. If the water bodies don't come back into compliance after the states have tried to implement their strategies, then you have to go back into that segment again and develop new strategies to try to bring that segment back into compliance.

This is a much different approach than was happening five years ago, ten years ago, or fifteen years ago. Will made the statement that he's not sure exactly why people haven't been as interested in merging the ESA and the CWA as we thought they would be. In many ways the TMDL (Total Maximum Daily Load) and the 303(d) List (those water body segments not meeting water quality standards) are about three to four to five years behind the ESA in the sense of people recognizing the potential impacts on them in the community. There is not a choice on coming into compliance. It is being mandated by the

courts. So as we follow along behind the ESA, and as we recognize the issues, we're trying to figure out a way to merge strategies and actions to address CWA and ESA concerns.

A second issue: Section 401 water quality certifications. A state has to certify that actions are consistent with the CWA. This is called a 401 Water Quality Certification. We are now starting to get some court decisions that say that nonpoint source actions, which we traditionally had not looked at under 401 certifications, have to be consistent with water quality standards. The first big case that came up in the Oregon courts dealt with grazing on federal lands, and the court decided that grazing was subject to CWA water quality certification. So all those private farmers who had received grazing permits for the last 100 years, under the federal law now have to go to the state of Oregon and get a water quality certification for every one of those permits. It doesn't take a rocket scientist to figure out that if grazing may be subject to that, why isn't road building in forest lands, and why aren't other activities going to be subject to water quality certifications.

A third issue: the water quality, water quantity linkage. There has been, in the West, a real desire to keep these issues separated for the last 150 years. First in time, first in right: I got my water and nobody can ever change the fact that I get that quantity. But the Supreme Court issued a decision about five years ago, the Jefferson PUD decision, that said there is a specific linkage between quantity and quality. Some of the segments that we show as not meeting water quality standards are listed because they don't have sufficient flow to meet water quality standards. This is a fundamental shift, which will lead to a fundamental debate over water quantity policy in the West over the next decade.

Fourth issue: tribal trust responsibility. As an example, there's a decision in New Mexico where Albuquerque had gotten a permit for the discharge of their municipal treatment system. The tribe downstream sued the permitting agency saying that they have water quality standards on their reservation. The water being delivered at their border did not meet their water quality standards. The court found in favor of the tribe: that there is a trust responsibility to deliver water to the border that meets water quality standards. Again, a shift in policy on the way that's been handled nationally.

A final issue: the shift to binding obligations to protect listed species and their habitat when the ESA takes effect. The issue of ESA consultation goes beyond CWA for many agencies. I had a discussion with the City of Tacoma this week about a Superfund cleanup in Commencement Bay. When we discussed remedies, my first question was "Have you consulted with National Marine Fisheries Service under Section 7 – or Section 10 because there are private companies involved – on making a determination?" The answer was no, we haven't yet. The presence of the ESA changes not only the CWA but also other aspects of regulatory authority. This has created a number of difficulties related to trying to solve these issues. Will talked about some of them, but just in the sense of double jeopardy, if you do a Habitat Conservation Plan (HCP), apparently, with either the Fish and Wildlife Service or the National Marine Fisheries Service, you typically get a letter that says, its nice that you've done that effort, but that doesn't necessarily mean you comply with the CWA. And we may come back in later and reexamine what you're doing to make sure that it is consistent with the CWA. We have double jeopardy in the system. That's why we're trying to push for one stop shopping and trying to figure out a way to merge activities to meet the requirements of both these federal laws.

A number of issues confront us as we try to address better merging of federal regulatory programs.

There is currently a lack of communications between agencies and levels of government. I think we need to figure out a way to deal not only with the relationship at the federal level, but the relationship between us and the states and us and the local jurisdictions. We're working hard on that, but there still is significant disconnect going on.

Agency resources are non-existent or mis-aligned. For traditional environmental agencies, you have an air program, a water program. It's all medium based, not geographic watershed based. The CWA and ESA approaches are geographic based. They look at ambient impacts in a watershed. They don't look at whether you have an air program or a water program, and we need to figure out how to re-align our resources.

There are also issues of risk acceptance. As Will mentioned, the HCPs that have been done are for 75 years. When we write NPDES permits, they're for five years. We at environmental agencies have

been less willing to accept a long-term risk in making environmental decisions. We think we got burned on dam re-licensing when they went for 40 years, and we don't really want to get into that business again. So we're trying to merge how much risk we're willing to accept as we merge what's going on related to ESA and what's going on related to the CWA.

The final issue: developing science. I've been in three environmental agencies in the last six years and I've tried to get them to do "state of the environment" reports. I've said, "we've collected data for 25 or 50 years, monitoring data and so forth, and I want to use that now." In response, I've been told that QA/QC isn't very good and we're not sure we can forecast or project with that information what changes need to be made from a policy side. And so I've said, in every instance, "Well, that makes it easier for me because I've just found \$10 million dollars worth of budget cuts for the next year." Because if you can't use the data, if you can't use the science, then why do the work in a social setting. I mean, I need good science to be able to support good policy decisions.

How do we deal with some of the issues raised by the shifting focus the CWA and the merging of CWA and ESA regulatory programs? Where do we need to go tomorrow? One solution is attention and focus. We're trying to get people's attention. Will and I have now given this talk probably five times in the last six months, where we're on the panel together trying to get people to take both of these seriously, and work together on both CWA and ESA, and I think we're trying to raise the attention and focus on it.

Secondly, we are still trying to settle some of the lawsuits that are out there. We're working on trying to get those done, and that's going to be critical to our long-term success.

Third, we need to try innovative approaches. We're currently working with all the interested parties on a timber, fish, and wildlife agreement in Washington. We're trying to negotiate both the CWA and the ESA requirements with the regulated industry, the environmental community, the tribes, and the state to see if we can't figure out a way to resolve the double jeopardy issue, at least in the state of Washington, on private forest lands. Whether we'll be successful or not, I don't know, but we're attempting to deal with that.

Fourth, we'll need to re-align resources. I think it goes without saying that we need to move to a more geographically based system. In our region we've set up a new ecosystem division that cuts across our entire organization to try to deal with underlying science and take action.

Finally, for those of you who have been paying attention, the President has announced a new clean water agenda. We think it's extremely important to get this agenda through Congress because it has a significant amount of resources that will be provided to deal with nonpoint sources in this country. One of the reasons that we did a great job in the 1960's and 1970's to deal with municipal waste discharges was because the federal government paid for it. We can talk about all kinds of things, but it paid for it and it provided 90 percent of the money through grants. If we're going to deal with nonpoint sources, we better figure out a way to start dealing with the costs involved. I don't think we're going to get a lot of people voluntarily coming to the table and deciding that they just want to do better and spend the \$100 thousand, or million, or two million, or three million necessary. The President's clean water agenda has about a half a billion dollars of new money to try to deal with these issues. I think it's critical that that becomes a portion of the solution over the next decade.

With that, thank you very much.

Evolutionarily Significant Units and Listing of Pacific Salmon under the Endangered Species Act

Robin Waples

Northwest Fisheries Science Center

For the last six years I've been part of a group at the Northwest Fisheries Science Center trying to answer a few questions about the status of Pacific salmon. The key questions we have to address are, first, "Do we have a species?" and, second, "Is it threatened or endangered?"

The first question, it turns out, is fairly complicated because of the language in the Endangered Species Act that allows listing not only of species or even sub-species, but also of distinct population segments of vertebrates, and that includes salmon. For salmon, where you have literally hundreds or thousands of local spawning populations for each of the biological species, this is a fairly significant issue.

Now what is a population that's distinct? There is a wide variety of ideas about that, so we had to develop a policy about how to implement that under the ESA. As Will said, our policy is based on a concept of evolutionarily significant units (ESU's). I'm not going to go into the details here because of the time, but we've taken a holistic approach where we try to integrate all biologically important information: genetics, life history, habitat information. We're trying to identify major chunks of diversity for the species as a whole that largely evolved independently of each other. Collectively they add up to a rough species as a whole. If we save those big chunks, then the species as a whole should be sustainable in the future.

In terms of the risk analysis, the second question, we look to the language in the Act where there are some definitions of what an endangered species is. We try to tie our risk analysis back to this language in the Act. And there is another twist. The Act says the listing determination has to be based on the best scientific information available after consideration of conservation measures. So at the center, in general, we stick to the technical information about the status of the stocks, and by mutual agreement, the conservation measures are generally evaluated at the regional level. So they're to ones that actually make the listing determinations.

There is a connection between the two major questions: What is an ESU and what is at risk of extinction? There are two kinds of errors we want to avoid in defining ESU's. First, we don't want to identify artificial units that are actually portions of the actual, underlying units. If we make this type of error we would be addressing a group of fish for which extinction is not going to mean much: what does it mean to lose part of one unit and part of another unit? If you lose a whole unit, you know what that means. Extinction is a biological process. It's irreversible. You can't get it back, but loss of portions of two related populations is difficult to interpret biologically or in terms of the ESA.

The other error we want to avoid is the arbitrary definition of a unit's geographic range based on political jurisdictions. Consider a population or group of populations that occur across an international boundary, say between the US and Canada. In spite of the international boundary and the fact that ESA listing sanctions would not necessarily apply outside the US, we think it's important, first, to identify a biologically meaningful unit, and then do the risk analysis on the whole unit. If we focus only on the U.S. part of population, you have the question "What does the extinction of that little bit mean?" It doesn't mean much unless you understand the dynamics in the relationship between that population to the rest of the populations in the real biological unit. This is a point on which we actually differ a bit with the Fish and Wildlife Service. They have used international boundaries as a way of defining distinct population segments.

I'll now go briefly through our status reviews. In 1994, we launched coast-wide status views for all the species of Pacific salmon and anadromous trout. We've done six of the seven now. I'll discuss five species: sockeye, coho, chum, chinook, and steelhead.

Sockeye salmon

The review of Puget Sound sockeye (pink) salmon was completed a couple years ago. Almost all of the pink salmon in this area are odd-year pink salmon, and for the most part those populations are

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healthy. There are a couple populations that are of concern, but for the most part, they are in really good shape. This ESU contains Strait of Georgia populations as well.

Sockeye salmon have a very unusual life history generally tied to juveniles rearing in a lake for one or two years. So what we have is a very, sort of, mosaic of population structure. They occur in discrete and isolated populations. For the most part, we have ESU's that are individual populations. This is very different from other species.

In our announcement two weeks ago, we have proposed to list as threatened Ozette Lake sockeye on the Olympic Peninsula. Baker River sockeye are identified as a candidate species. Basically, that means there's a lot of concern, but also generally a lot of uncertainty. Looking at the abundance of Baker River sockeye we note a really depressed state through the late 80's. If we did the stock assessment then, we probably would be proposing listing now. However, we've seen a huge spike in the abundance of Baker River sockeye in recent years. It's hard to know what to make of that. Is that going to persist, or are we going to back down in the troughs in the next few years? This large interannual variability in abundance is a concern. And also there's a lot of heavy human involvement in the perpetuation of that stock. It can't survive at the present time without human intervention. So that's another factor.

Coho salmon

A year or two ago the National Marine Fisheries Service announced that Puget Sound coho salmon would be a candidate species. There is plenty of reason for concern, but there are a lot of coho salmon in Puget Sound. There is a lot of uncertainty about how the Sound's coho are sustained by natural production.

One of the reasons for concern for Puget Sound coho, based on data pulled together by Laurie Weitkamp, who is head of our status review, is that the size of coho salmon caught in terminal fisheries in Puget Sound has declined by about 50% in the last twenty years. A lot of factors might contribute to this decline, but whatever the reasons, the fact that the fish are half as big as they were 20 years ago means that they are going to have fewer eggs, they will only be able to dig shallower redds that are more likely to be scoured by rains, and so on. We believe it is a significant risk factor we believe for the natural population.

Chum salmon

Much like the pink salmon, most of the chum salmon in Puget Sound are fall run, and they are relatively healthy. Their ESU, again, extends up into the Strait of Georgia. A few isolated populations are of concern, but in general, they are very robust and near historical abundance. On the other hand, there is a very distinctive group of summer run chum salmon from Hood Canal. Genetic data indicate that this is a very ancient lineage. Very distinct from other populations and even distinct from the summer run in south Puget Sound. The Hood Canal summer-run chum are in really tough shape and we have proposed listing for them.

Looking at the data for Hood Canal chum salmon we see that the fall run is quite robust, although a lot of those are hatchery fish. Until the last few years, however, Hood Canal summer chum numbers have been very low. In the last couple of years there has been a big spike in numbers for some of the Hood Canal summer chum populations. A lot of the populations remain essentially zero or very few spawners, but some of them have made a huge comeback in the last couple of years. So, again, this is a very difficult ESU to evaluate,

Steelhead

A listing determination for Puget Sound steelhead was announced about a year or so ago. The population in Puget Sound was not really considered healthy but it was not considered to warrant listing at the present time.

Chinook salmon

As everyone knows, Puget Sound chinook salmon were proposed as a threatened species two weeks ago. I'd like to point out that all of the listing determinations, all of the proposals for Puget Sound stocks at the present time are just proposals. There will be year of public comment and review of new information before any final listing determination is made.

One of the reasons for concern for Puget Sound chinook salmon is a decline in productivity of the population. Looking at a combination of data for all runs in the Skagit River we see a steep decline in the number of recruits per spawner—a measure of the productivity of the population. The really scary thing is that this is happening in the face of declining harvest rates. Typically, one of the tools managers have to deal with declining recruits and declining populations is to ease off on the harvest rate. They've done that to a significant degree, but there has been no response in the populations.

Finally, before I close, since this is a science conference, I wanted to point out that there a lot of technical issues that are very difficult in both ESU and risk analysis determinations, and we continue to work to try to improve the process. For the risk analysis, you know the definitions of the threatened and endangered but basically we have to deal with questions like: What is likely to become endangered or threatened? What is the foreseeable future? What is a significant portion of an ESU? That's a major question. How do we evaluate the genetic and ecological effects of hatchery fish?

Questions and Answers (Keynote Panelists)

Clarke: [unrecorded question and beginning of answer] ... work out how best to deal with that. It's an issue, having run state agencies, and gone through water quality standards processes, and knowing how difficult they are and how political they can become, we know it is going to be a challenge at best. We're trying to figure out how to really get our act together so that we can provide information that is useful and usable for the standards process. But we are looking directly at that issue.

Stelle: Let me just add one example to give you a sense of what the options may be. If you recall the chart I put up with the pathway of water quality, and the indicators are temperature, turbidity, and sediment loading. Those are the conventional expressions of water quality under state and federal water quality criteria and standards. Let me describe two situations where you may be able to achieve those standards. Take a concrete pipe, or take a small stream and line it with concrete. Line the upper banks with concrete and pave it. Plant some vegetation over that stream; small bushes, not big trees, to deal with the issue of temperature. And you may have yourself a stream segment that satisfies state water quality standards. But from a fish perspective, it's a dead stream. That's really the difference between the conventional notion of water quality as applied and this more complicated concept of a healthy aquatic system. I boil it down to the two adjectives of sinuosity and complexity. Sinuosity and complexity should be the characteristics of a healthy aquatic system. We are not looking at paved channels.

Friedman-Thomas: Will, I was recently reading the federal register document on the proposed listing and I was interested in your presentation on the Section 10 types of activities that would be considered for considerations of "take," and you mentioned permitting, licensing, and funding. I remember reading in the proposed listing document about rulemaking, and I didn't hear you speak about that today. I wonder if you could talk a little bit about that and what the expectations are for both federal rule making as it pertains to potential listings and subsequent "take" considerations, as well as state level rulemaking.

Stelle: That was one of those finer points in the earlier slides that I raced through. Section 4 of the ESA authorized the agencies to apply take to threatened species. This gets technical. Technically under the statute, the prohibition against take automatically applies by statute to activities that harm endangered species. The services have the authority to apply that same prohibition to threatened species as well as endangered species. The Fish and Wildlife Service, as a general program regulation, promulgated a rule ten years ago that said every time we list a species as threatened, we will automatically apply "take," period. We have not done that under the National Marine Fisheries Service, and every time we promulgate, make a final decision on listing a species, we issue also a rule that applies take to it.

The interesting thing, from my perspective, is the ability to shape the way we apply or don't apply "take" to threatened species in order to accommodate commitments by states or counties in conservation plans to recover species or their habitat on that landscape. If we're able to get those firm, reliable conservation strategies in place, we can by rule, not apply "take" to those activities or that geography. There is a lot of flexibility in the way in which we can or cannot apply the prohibition on "taking" to activities that may harm a threatened species. But it's a complicated point.

Houghton: Will, there are a number of activities underway in the Sound, in particular, in Commencement Bay, on clean up of contaminated sediments under CERCLA and state sediment management actions. I wonder if you could comment a little bit on how ESA proposed listings at this point might effect those actions, and also in particular the schedules or the additional reviews that would be required for those proceedings.

Stelle: I'm not that familiar with the remedial work in Commencement Bay and elsewhere. As a general matter, the remedial work under CERCLA has two objectives to it. The first one of which is to clean up for purposes of human health reducing risks to human health and the environment. The second is to

remediate the site in order to remedy damages to natural resources caused by the hazardous substances. It's in that second phase of the fixing the damages to the natural resources where some of the principal natural resources that may have been damaged by those CERCLA sites may well be salmonids. I would hope that in the design of the remedial plan, that salmonid needs have been identified and been taken into account. If they haven't, we have a problem. In the second point of the question; what kind of additional reviews? The approval of those clean up plans is a federal action. They will require consultation under the ESA and it's just one more thing. Frankly, we have a serious problem of what I think of as bottlenecks. The workload here is enormous and the staffing that is available to do it is minimal, and the two do not meet.

Malmgren: Robin, a question regarding hatchery fish. In some of your slides, there was an indication of low populations in, say, 1927. I'm familiar with the problems of the four H's, and so forth, and I'm hoping that you will be developing very, very careful statistics on the impact of the hatchery fish. Many of the tribe's areas would be destitute without our hatcheries, and, my bias is habitat restoration, are you being very, very careful to evaluate the risk associated with hatcheries?

Waples: That's a good question. I guess the answer is we are as careful as we can be given limited data. Unfortunately, the possible effects of hatchery fish on natural populations are quite diverse and complicated, and in general, fairly easy to understand conceptually. Sure, these sorts of things can happen, and we have evidence that they have happened in certain cases. But in any particular example, for any particular population say of any particular species, it's very difficult, even with a fairly impressive monitoring program, really to know for sure what the effects have been. In general, we don't have very impressive monitoring systems. Sometimes we have almost no data whatsoever. So that is one the biggest sources of uncertainty and also controversy I think about some of the listing determinations is how you deal with the effects of hatchery fish. So I guess, again, our answer is, we are doing the best job we can in looking carefully at the data, but it's not easy, given the scarcity of the data.

Malmgren: I hope you're really careful because we in the state have a system of funding fish and wildlife by our fee structures and so forth. And if we don't have the fees and so forth we've got to really look at other monies to fund the system, and I'd hate to see the whole deck of cards and everything collapse. So I think what you're doing is extremely important for the total resource. Thank you.

Waples: There's no reason why hatcheries can't be consistent with the ESA. They can be in two ways. One, if they're part of a recovery plan for at risk populations. And second, if it's possible to keep the hatcheries as separate as possible so that the level of incidental take doesn't rise too high. Both of those are avenues.

Malmgren: I'd like to hear the hatcheries as part of the recovery plan.

Waples: It already is, in many of the ESU's that are listed.

Coachman: I work for NPDES MS4 Phase One, and we have lots of projects that are federally funded and federally permitted that are in the pipeline. And we're wondering how the Section 7A requirement for conferences will be affecting us. You haven't addressed that so far, Mr. Stelle.

Stelle: Good question. The Section 7 prohibitions on federal agencies jeopardizing the continued existence of listed fish apply basically to species which have been listed as a final matter under the ESA. For those that have been proposed for listing, there's also another tier of protection. And there is a process associated with that protection as well. The Section 7 of the Act says that, for proposed listings, if federal agencies are proposing to do things that may jeopardize, then they have to confer with the National Marine Fisheries Service to determine whether or not it will, and if it does, then they have to change it. That's the conferencing obligation, and it attaches to activities that may jeopardize proposed listed species. I'm not quite sure what the precise question is, but the threshold for triggering a conferencing obligation is higher than it is for consultations. It's only those activities that may

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jeopardize, not which may effect. And I expect a small avalanche of requests, conferencing requests, over the next six months as federal agencies sift through what they may be doing and their potential impact on salmonids. Again, it's part of the workload problem.

Maria-Victoria Peeler: My question is for Will and Chuck both. I was wondering, Will, if you can address the prelisting agreement section in ESA and whether, under a prelisting agreement, if either the ESA or the state can make a jump start on this process.

Stelle: The short answer is yes. The reference is to authorities under Section 4, which stipulates that we can enter into agreements. They are like habitat conservation plans, they are conservation agreements with an entity, be it a federal entity, a state entity, a county or private entity, and those prelisting agreements basically get rolled over in the event of a listing as a habitat conservation plan. The basic deal is if you will promise to do X, Y, and Z over the next period of time and if you adhere to this promise, then we promise that you won't be subject to potential "take" liabilities of the ESA in the event species get listed. Those are prelisting agreements, and yes, they are available.

Peeler: So the second question to Chuck. Does EPA have in mind any plan to do something like this?

Clarke: That's part of the discussions that we have been having recently. I think, to give you a specific example where we might be able to really force-fit the two issues and do it the right way, that there have been a lot of questions, and I mentioned the 303(d) list and Total Maximum Daily Loads (TMDLs) that are going to have to be established across the region. In many ways, there have been questions about the implementation authority related to making sure that a TMDL to bring a segment back in compliance with the CWA is enforced. One of the ways that we may make sure it's enforced is make that a part of the ESA consultation process. That to avoid going forward, you not only have to do a TMDL, but you have to implement all the actions associated with the TMDL to meet both the requirements under the CWA and under ESA. And so trying to figure out a way to fit those two issues together takes you, in essence, back to Will's point of one-stop shopping. We're also talking right now, in many instances, about how to get out in front of other potential listings in the future, so that we can sit down and deal with states jointly on water quality standards and things like sediment and temperature and other aquatic issues, rather than waiting until those processes occur later on. So we are trying to figure out a way to deal with those.

Parr: I'm with the Washington Department of Fish and Wildlife. This question is directed to Robin Waples in terms of the genetic constitution you currently understand about the stocks at risk. Evolution is a dynamic process and my question is "Are future ESU's of the current ESU stock structures based on original genetic structure, and secondly what influence has habitat alteration had on the selective pressure or differential survival of salmonids in ESU range?"

Waples: Again, that's a good question. In general, in defining ESU's, what we're shooting for is to find ESU's or identifying units (usually groups of populations for most species except sockeye) that we believe behave largely independently from other large units over evolutionary time frames, which we would define as, say, hundreds or thousands of years. So what we're looking at in terms of ESU's are largely a result of a process of evolution over the last hundreds or thousands of years, say since the last ice age. We don't try to project which groups will be ESU's into the future. We think that if we identify these major chunks and conserve as many as possible, as you say, the process of evolution is dynamic, and it'll go on by itself. At some rate in the future, if we save enough of those, there will be enough options for the species as a whole to evolve, I think.