



**Testimony of Dr. Jack E. Williams  
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**Before the  
House Subcommittee on Insular Affairs, Oceans, and Wildlife  
Washington, D.C.**

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Madam Chairwoman and members of the Subcommittee, my name is Jack Williams and I serve as Senior Scientist for Trout Unlimited. I appreciate the opportunity to appear before you today to provide my views on both the Pacific Salmon Stronghold Conservation Act (H.R. 2055) and the National Fish Habitat Conservation Act (H.R. 2565).

Trout Unlimited (TU) is the nation's largest coldwater fisheries conservation group dedicated to the protection and restoration of our nation's trout and salmon resources and the watersheds that sustain them. Now 50 years after its founding, TU has more than 140,000 members in the 400 chapters across the United States. Our members generally are trout and salmon anglers who give back to the waters they love by contributing substantial amounts of their personal time and resources to fisheries habitat protection and restoration. The average TU chapter donates 1,000 hours of volunteer time on an annual basis.

Prior to working for TU, I was privileged to serve in a number of research and management positions in the federal government, including Endangered Species Specialist for the U.S. Fish and Wildlife Service, National Fisheries Program Manager for Bureau of Land Management (BLM), Science Advisor to the Director of the BLM, Deputy Forest Supervisor on the Boise National Forest, and Forest Supervisor on the Rogue River and Siskiyou National Forests. I have also served as a Professor at Southern Oregon University and retain the title of Adjunct Professor at that institution. I have volunteered for leadership roles with the American Fisheries Society, including Chair of their Endangered Species Committee, where I led several reviews of the status of North American freshwater and anadromous fishes.

In my testimony today, I will explain the two very important bills to improve fisheries management. The first half of my testimony will focus on the importance of including the salmon stronghold approach into the existing suite of federal salmon policies. The second half of my testimony will cover equally important national legislation to catalyze public and private joint ventures to protect and restore habitat for fishes throughout the United States through the National Fish Habitat program. Both of these bills are scientifically sound and are badly needed to advance the fisheries conservation goals of the Nation. The two bills are complementary, compatible, and mutually supportive. TU strongly supports them and urges the Subcommittee to approve them, and we greatly appreciate the leadership of Representative Mike Thompson and his cosponsors for introducing the Salmon Strongholds bill, and Representative Ron Kind for introducing the National Fish Habitat bill.

## The Pacific Salmon Stronghold Conservation Act of 2009

Just over a year ago, I had the opportunity to testify before Congress on the plight of West Coast salmon in light of the crash of Chinook populations in California and Oregon. At that time, I emphasized the need for bold action and commitment to save our salmon, outlining key steps the federal government and others would need to take to achieve success:

“To help salmon survive the effects of rapid climate change, there needs to be an active and integrated effort to **protect** the best remaining populations and their habitats, to **reconnect** headwater streams with mainstem rivers by removing instream barriers and providing normal flow regimes, and to **restore** vital mainstem river and riparian habitats. For these efforts to be sustainable they must be founded in the best available science and implemented at local, state and regional levels. “

I am delighted to again come before Congress, this time to applaud your leadership to establish a federal policy supporting preventative, pro-active efforts to protect healthy salmon rivers. If there is a message from my testimony on the Pacific Salmon Stronghold Conservation Act that I hope stays with you in the weeks and months to come it is this: Congressional direction is absolutely necessary to implement a winning, science-based salmon strategy. As I will explain, enacting the *Pacific Salmon Stronghold Conservation Act* (“Salmon Stronghold Act”) will provide a critical missing element to current salmon conservation and management policies by focusing on pro-active, preventative actions to protect North America’s healthiest wild salmon rivers.

### The Economics, Ecology and Culture of Wild Salmon Ecosystems

When we speak of salmon ecosystems, we are talking about much more than salmon. Economically, salmon are a critical driver, generating billions of dollars annually and providing communities throughout the entire West Coast with thousands of truly sustainable employment opportunities.

Ecologically, salmon are what is known as a “keystone” species, a key link in the food web upon which more than 100 other species depend, including eagles, bears, river otters, and numerous other species. Salmon are also an “indicator” species, informing us about the health of our freshwater and marine systems. They may one day soon become a leading indicator of climate change, as salmon respond and adapt to warming oceans and altered hydrologic flows in rivers. Salmon are also a highly migratory and trans-boundary species, requiring international cooperation and current Treaties with other salmon-bearing nations across the Pacific Rim.

The migratory nature of salmon also enhances their ecological value. Recently, scientists have begun measuring the impact that returning salmon have on nutrient content of headwater streams where salmon spawn and die. Dr. Peter Moyle and colleagues at the University of California-Davis recently documented up to 25% marine-derived nitrogen contribution to riparian plants and even wine grapes grown along California coastal rivers (Merz and Moyle 2006). The contributions of salmon carcasses and eggs to the productivity of stream systems can be substantial in areas where the number of spawning salmon approaches historic population levels.

Culturally, salmon have helped shape our regional identity and salmon form an iconic link to our past and future. Finally, salmon also provide a wild and traditional source of nutrition and protein which continue to nourish our people.

Salmon populations and their habitats have been declining for many decades. In 1991, I coauthored a report that for the first time, provided a comprehensive review of salmon and steelhead in California and the Pacific Northwest (Nehlsen et al. 1991). We documented 214 populations at risk of extinction and another 106 stocks that were already extinct in California, Idaho, Oregon, and Washington. At that time, only 1 population of salmon, Sacramento's winter Chinook was listed pursuant to the Endangered Species Act. Now federally-listed salmon and steelhead are spread up and down the coast.

Despite the broad declines these fish have suffered, you might be surprised to learn that there are relatively healthy stocks remaining in this same area, and even more so as you proceed north into Canada and Alaska. Wild Pacific salmon and steelhead are very resilient, and remain healthy and relatively abundant in a handful of North American rivers, including the Smith in California, Illinois in Oregon, and Hoh River in Washington. Yet, the future of wild Pacific salmon is at a crossroads today, and our ability to learn from the past and establish a comprehensive and strategic approach to salmon conservation and management will likely determine whether future generations will continue to enjoy the economic, cultural and ecological benefits of healthy salmon ecosystems.

### **A More Strategic Approach to Salmon Conservation**

The United States has a variety of laws, policies, and regulations aimed at protecting rapidly declining stocks of salmon and steelhead that are at risk of extinction. This is a necessary part of salmon conservation strategy because we have already lost a large percentage of salmon diversity and are at risk of losing much more. Scientists from the National Marine Fisheries Service estimate that we have lost as much as 29% of the approximately 1,400 stocks of salmon and steelhead from the western contiguous United States (Gustafson et al. 2007).

Many fisheries management activities focus on protecting weak or threatened stocks while society reaps the economic and ecological benefits of more robust and healthy stocks. Most freshwater restoration work focuses on mitigating impacts of hatcheries and the need to recover federally-listed populations. Seldom do we focus on protecting remaining healthy stocks or bolstering their habitat.

Current salmon programs sustain two legs of a three-legged stool by relying principally on:

1. International cooperation for bi-national salmon harvest allocations, sustainable management and a ban on high seas salmon fishing implemented by the Pacific Salmon Commission established under the U.S.-Canada Pacific Salmon Treaty and the North Pacific Anadromous Fish Commission and;
2. Recovery of salmon populations listed as threatened or endangered under the Endangered Species Act.

The *Pacific Salmon Stronghold Conservation Act of 2009* will complement these efforts and make them more effective by adding the third leg of the stool:

3. Identifying and protecting a network of wild salmon strongholds by empowering voluntary, incentive-based actions to achieve scientifically derived salmon conservation goals.

We have invested millions of dollars in salmon recovery efforts, but these efforts alone will not be sufficient to prevent future listings or safeguard against future declines. Complementing existing salmon recovery programs with the stronghold approach embraced in the Salmon Stronghold Act will invigorate voluntary public and private efforts to protect core centers of wild salmon abundance and diversity (“wild salmon strongholds”) and ensure federal cooperation and coordination in these stronghold basins. This approach will also help avoid expensive future restoration costs by reducing the likelihood of future listings under the Endangered Species Act.

### **Protecting Strongholds Obeys a Core “First Principle” of Conservation Biology**

Protecting the best remaining stronghold populations has long been recognized as the First Principle of conservation biology. The concept of protecting salmon strongholds has been promoted as a scientifically sound and cost effective approach to anchor wild salmon populations (Rahr and Augerot 2006). Additionally, scientists have argued for a large, watershed scale approach to fisheries conservation that would protect entire healthy watersheds and the native fish communities contained therein (Moyle and Yoshiyama 1992).

Unfortunately, the salmon stronghold protection concept has rarely been put into practice and never on the scale that conservationists have hoped for. In the Pacific Northwest, federal agency scientists identified a number of “key watersheds” that received special protection for salmon and steelhead as part of the Northwest Forest Plan. The key watersheds were only identified on federally-managed lands, but nonetheless it has proven effective in helping to maintain and restore aquatic habitat conditions, even in the face of unanticipated wildfires (Reeves et al. 2006). A broader application of the approach holds promise and would become a reality through the Salmon Stronghold Act.

The strategy proposed in the Salmon Stronghold Act applies rigorous scientific analyses to the following three steps:

1. Identifying “stronghold” rivers based on abundance, diversity and wildness for each salmon “eco-region” throughout the North American range of wild Pacific salmon;
2. Establishing conservation goals for each salmon eco-region, optimizing the most efficient combination of rivers necessary to meet those goals; and
3. Investing in the “highest conservation value” actions in strongholds to address key limiting factors and maintain ecological function.

I can assure members of Congress that there is broad agreement among my scientific colleagues in and outside of government that the identification and protection of a network of salmon strongholds represents a critical but heretofore missing plank of a broader, more strategic salmon conservation and management strategy. Fortunately, science and technology is providing us improved tools and methodologies to ensure that our investments in these extraordinary rivers earn the greatest return.

Broad-scale assessment tools now provide a cost-effective means of modeling habitat quality and assessing the intrinsic potential of rivers to produce wild fish. My own organization, Trout Unlimited, has developed “Conservation Success Indicators”, employing such procedures to inform us “what success looks like” in a river and how to measure the effectiveness of our efforts. If this legislation becomes law, we would have the data, assessment methodology, and policy needed to help build a

distributed network of salmon strongholds and to apply conservation planning approaches that will serve as a model for effective long-term ecosystem management.

### **Salmon Stronghold Protection May Afford the Best Strategy for Climate Change Adaptation**

Climate change and global warming are among the greatest threats facing ourselves and our natural resources. Salmon, because of their dependence on cold, clear water, are especially vulnerable. Climate change is likely to alter weather patterns and storm events across the United States with significant negative consequences for salmon resources. A general warming pattern will result in increasing stream temperatures, increasing evaporation rates and drying of forest and grassland vegetation. These effects will increase wildfire intensity and frequency, especially at mid-elevations. River flows and hydrologic regimes also will be altered, with consequences not only to fisheries but also to water supplies in general. More winter precipitation will fall in the form of rain than snow, especially at lower and mid-elevations. This will reduce snowpack and increase the probability of rain-on-snow events, likely resulting in increased winter flooding. With more rain during winter and reduced snowpack, peak stream flows will occur earlier in the spring and low or base flows during summer and autumn will be reduced. Stream flows will be less consistent from year to year.

Overall, storm intensities will be greater. Floods, drought, and wildfires are all likely to increase. The increased variability and longer duration of wet cycles and dry cycles will cause considerable additional stress to natural ecosystems.

In all cases, impacts of climate change must be viewed within the existing management context and conditions of natural systems. Watersheds, riparian systems, and streams that are in better condition will be more resistant to disturbance and more likely to rebound quickly. On the other hand, habitats that are degraded and fragmented will be less able to adapt to climate change risks. The effects of rapid climate change will be compounded with, and magnify, existing stressors. In poor-condition lands without adequate protective vegetation along streams, floods will be more severe with greater erosion and floodplain damage.

Because healthier systems will respond best to rapid climate change, perhaps the most effective strategy to successfully combat the coming stressors and disturbances is to restore and protect our best remaining natural river systems. Securing core wild salmon centers of abundance and genetic diversity will be critical to improving the odds that salmon will persist and thrive through a period of rapid environmental change. Keeping these systems healthy and productive will generate additional benefits as well.

Intact, well-functioning salmon ecosystems are, generally speaking, better able to buffer and mitigate the impact of climate change by providing climate regulating functions such as flood control, carbon sequestration and a mosaic of diverse habitats less vulnerable to changing conditions (i.e. – invasive species, temperature, etc). Leading climate change scientists from the region are working closely with the North American Salmon Stronghold Partnership to explore these linkages and to provide the results of their research assessing which salmon rivers are most likely to be resilient to climate change based on the available models and projections. This information will help us invest wisely where we have the best long-term chance for success.

## **The Role of Science and Innovative Market-Based Approaches to Conservation: Payment for Ecosystem Services**

One of the most innovative provisions of the Salmon Strongholds Act is its payments to landowners for ecosystem services. It is well known that natural systems provide ecological services essential to our well being and economy. Seen as an ecological unit, healthy watersheds help illustrate this fact by providing clean water for drinking, irrigation and fish and wildlife; flood control; soil nutrient cycling and pollutant filtration; recreation, including hunting and fishing; and mitigation of drought. Over the years, several federal, state and private programs have emerged to acknowledge the economic value of these services and to provide incentives for landowners and resource managers to be good land and water stewards (see [www.fs.fed.us/ecosystemsseervices/Farm\\_Bill/index.shtml](http://www.fs.fed.us/ecosystemsseervices/Farm_Bill/index.shtml)).

More recently, several initiatives throughout the country have successfully improved coordination among many of these incentive-based programs to bundle them into a more landowner-friendly “payment for ecosystem services” approach (see Willamette Partnership at [www.willamettepartnership.org](http://www.willamettepartnership.org) ). Essentially, these efforts:

1. Assess the ecosystem services produced by a relevant unit of nature;
2. Determine ecosystem health goals and targets for specific ecological services (water quality, temperature, available spawning grounds, etc.);
3. Provide incentive payments through existing or new programs to reward resource stewards for best practices.

There has been a considerable volume of scientific literature examining ecosystem services methodologies and approaches and many of the same conservation science tools and approaches mentioned above now make the assessment of ecosystem services routine and feasible. In December 2008, the U.S. Department of Agriculture established a new “Office of Ecosystem Services and Markets” to implement Section 2709 of the Farm Bill. The Farm Bill will facilitate the participation of farmers, ranchers, and forest landowners in emerging ecosystem markets (see [www.fs.fed.us/ecosystemsseervices/Farm\\_Bill/index.shtml](http://www.fs.fed.us/ecosystemsseervices/Farm_Bill/index.shtml)).

Salmon ecosystems typically contain areas with existing incentive-based programs suitable for integration into a coordinated ecosystem services pilot. Watershed scale payment for ecosystem service initiatives are well underway in California, Oregon and Washington, with the support of state, federal, and local governments and private landowners. The North American Salmon Stronghold Partnership affords an ideal opportunity to work at regional and local levels to design and coordinate payment for ecosystem pilot projects in one or more strongholds to provide a more coherent and results-based means of delivering incentive programs to landowners.

## **National Fish Habitat Conservation Act of 2009**

*“No natural areas have been as degraded by human activities as freshwater systems.”*

*–James Speth, Dean, Yale University School of Forestry & Environmental Studies*

Whereas the Salmon Strongholds bill would provide one of the missing pieces of the salmon conservation puzzle, the National Fish Habitat bill is needed to arrange existing pieces in a more effective way, and add funding, to produce landscape scale fisheries conservation that currently does not exist, but is sorely needed. Across all regions of the United States, our native fishes and other aquatic species are declining rapidly despite our best efforts. Many of our streams and rivers are dammed, diverted, and polluted to the point that more than one in three native fishes in the United States is at risk of extinction. Rates of decline are even greater among many of our most ecologically and economically valuable species such as trout and salmon. Expenditures for river restoration exceed \$1 billion annually yet expected extinction rates are 5 times higher for freshwater species than for birds, mammals or other terrestrial species (Bernhardt et al. 2005).

In general, the status of aquatic resources, such as fishes and freshwater mussels, are in worse condition than are terrestrial-dependent species, such as birds or reptiles (see Figure 1). Habitat is the key. Rivers, streams, associated riparian habitats, lakes and wetlands have all been altered at greater rates than grasslands, shrublands, and forests.

Unfortunately for our fisheries, the future will not get brighter unless we take decisive action. The synergy of a growing demand by people for fresh water, rapid climate change, and the explosive invasion of non-native species all threaten aquatic communities and areas of species richness. Protecting, reconnecting, and restoring habitats across large scales will be necessary to reverse these trends (Williams and Williams 2004).

The National Fish Habitat Conservation Act acknowledges the importance of fisheries to our ecological, economic, and cultural well being and provides a more strategic approach to their management and protection. Further, the Act facilitates coordination and cooperation by the state and federal agencies, Tribes and private conservation groups such as Trout Unlimited, in fisheries management. This is critical because fisheries and the streams and rivers that harbor them know no boundaries.

### **Multiple Geographic Scales and Coordination in Fisheries Management**

Fisheries problems are best diagnosed at large geographic scales. Fisheries are best managed at the scale of entire watersheds. Individual species are best managed across their entire range. One of the primary reasons that stream restoration efforts are sometimes unsuccessful is that the project proponents did not adequately consider the upslope and upstream context of their project (Williams et al. 1997).

The eastern brook trout provides a good illustration of the importance of looking at the bigger picture. Several years ago, the Eastern Brook Trout Joint Venture (EBTJV) was formed to conduct an assessment of trout population and habitat condition across 17 eastern states stretching from Maine to Georgia. The assessment was able to identify the most significant problems for brook trout and suggest strategies that the EBTJV has employed to the fish's advantage. In addition, the Joint Venture provides a forum to

understand emerging issues and concerns, such as climate change. The EBTJV is an unprecedented effort to focus and leverage the resources of state/federal agencies and conservation groups resources on protecting and restoring the habitat of a species that is not threatened or endangered. It has served as a model for other partnerships that have arisen through the National Fish Habitat Action Plan and has helped guide the development of the bill.

The bill embraces landscape and watershed scale management of our fisheries resources. Fish Habitat Partnerships (9 endorsed, 11 candidates) are the primary work units of the Action Plan. They are formed around landscape scale aquatic habitats, distinct geographic areas, keystone fish species or system types. They operate at a scale necessary to make a measurable difference.

The National Fish Habitat Conservation Act provides for the same level of coordination and oversight that was achieved through the EBTJV partnership. The Act establishes a National Fish Habitat Board to govern, promote, oversee, and coordinate Action Plan implementation. Among its functions, the Board will coordinate agency and other stakeholder involvement at the national level, establish science-based strategies for fish habitat conservation, and recognize existing and new Fish Habitat Partnerships.

Further, the bill is voluntary and incentive-driven. The rights of private landowners, and the prerogatives of state governments, have been fully protected through its provisions in the sale or leasing of land and water rights. There are no regulatory elements in the bill.

The Act further authorizes a meaningful amount of funding (\$75 million) for conducting priority habitat restoration projects through the oversight of Fish Habitat Partnerships. TU is extremely grateful that that Congress has provided \$5 million for the program over the past two years in a very difficult financial climate, but the need for funding is large and \$5 million does not go far.

In short, the Act will provide an umbrella under which numerous fish habitat initiatives can be nested in order to bring a national perspective to identifying species and habitats that need the greatest attention. It follows closely the steps taken by the authors of the successful North American Waterfowl Management Plan and the subsequent North American Wetlands Conservation Act which was passed by Congress to help implement the Waterfowl Plan.

## **Conclusions**

TU believes that it is time for Congress to support these two proactive approaches for fisheries management. The potential for additional fisheries losses are too great, especially in an era of rapid climate change, to continue with business as usual. Healthy fisheries are vital to the economic and ecological well-being of our country. In addition, many fishes, such as salmon and trout, provide numerous recreational opportunities that bridge generations and introduce our youth to the great outdoors.

As I conclude, I want to add a cautionary note. These bills represent necessary steps toward coordinated, proactive fisheries management. They do not constitute a silver bullet for fisheries conservation. To restore salmon, Congress and the Obama Administration must still face up to other pressing imperatives, such as recovering Snake River, Klamath River and Central Valley salmon and steelhead, and implementing the U.S.-Canada Pacific Salmon Treaty. Nationally, many other steps need



to be taken, including protecting roadless areas on our National Forests and restoring Clean Water Act protections for small streams and wetlands. The Salmon Strongholds and National Fish Habitat Conservation bills will enable us to vastly improve fisheries conservation as we work to address these other challenges.

For too long, our native fish resources have been managed in a piecemeal and largely reactive manner. Both the Pacific Salmon Stronghold Conservation Act and National Fish Habitat Conservation Act provide a more holistic and proactive approach to the management and conservation of fishery resources. I am pleased to provide testimony supporting both Acts as significant steps forward in our nation’s effort to conserve our natural heritage. Thank you for the opportunity to testify before the Subcommittee.

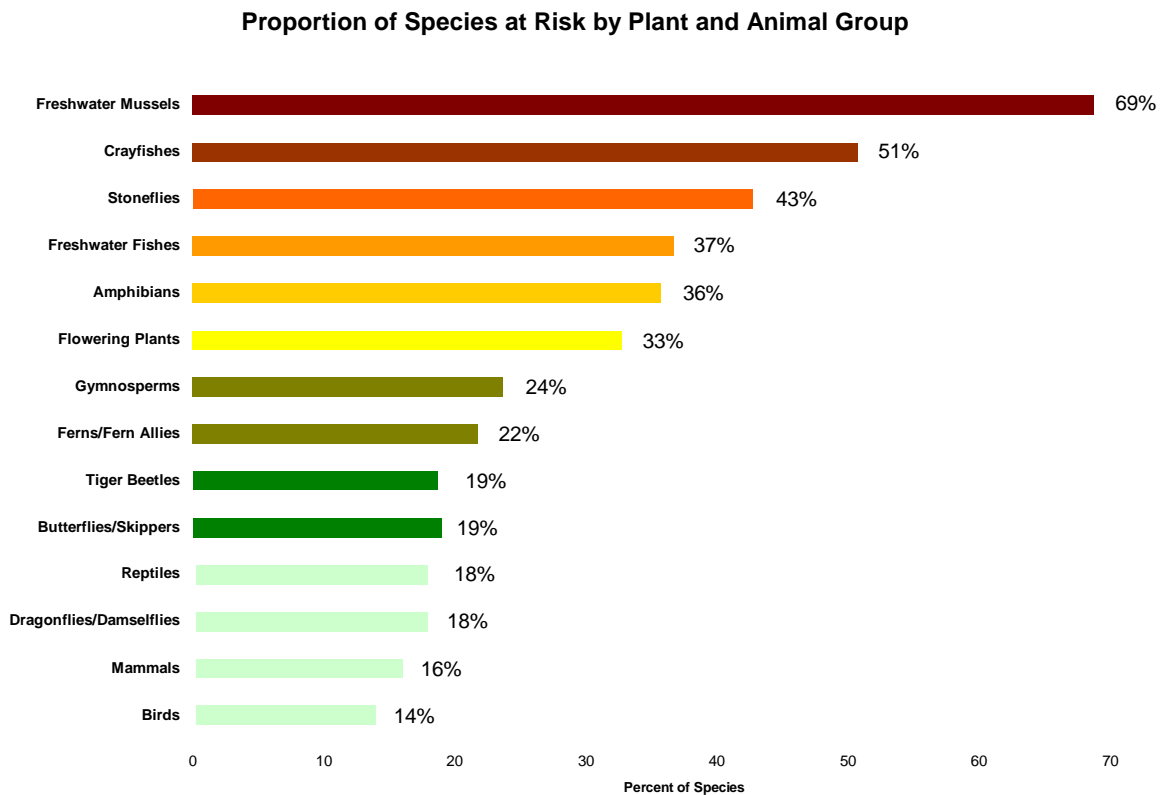


Figure 1. Comparison of the proportion of various plant and animal groups at risk of extinction. Note that the aquatic groups have the highest proportion of species at risk compared to terrestrial groups. Data from Master et al. 2000.

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