

**S. 817, THE PACIFIC SALMON STRONGHOLD
CONSERVATION ACT**

HEARING

BEFORE THE

SUBCOMMITTEE ON OCEANS, ATMOSPHERE,
FISHERIES, AND COAST GUARD

OF THE

COMMITTEE ON COMMERCE,
SCIENCE, AND TRANSPORTATION
UNITED STATES SENATE

ONE HUNDRED ELEVENTH CONGRESS

SECOND SESSION

APRIL 15, 2010

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S. 817, THE PACIFIC SALMON STRONGHOLD CONSERVATION ACT

THURSDAY, APRIL 15, 2010

U.S. SENATE,
SUBCOMMITTEE ON OCEANS, ATMOSPHERE, FISHERIES,
AND COAST GUARD,
COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION,
Washington, DC.

The Subcommittee met, pursuant to notice, at 10:04 a.m. in room SR-253, Russell Senate Office Building, Hon. Maria Cantwell, Chairman of the Subcommittee, presiding.

OPENING STATEMENT OF HON. MARIA CANTWELL, U.S. SENATOR FROM WASHINGTON

Senator CANTWELL. Good morning. The Senate Committee on Commerce, Science, and Transportation, Subcommittee on Oceans, Atmosphere, Fisheries, and Coast Guard will come to order.

Welcome, everyone. We are glad you are here today to have a hearing on the Pacific Salmon Stronghold Conservation Act, and we appreciate all of you being here today to give testimony on that important piece of legislation.

Wild Pacific salmon are central to the culture, economy, and environment and identity of the Pacific Northwest and have played a key role in our region's history. For centuries, American Indian tribes of western northern America have relied on salmon for their livelihood, well-being, cultural and spiritual connection that today remains as strong as ever.

As an icon of the Pacific Northwest, wild salmon are at the heart of what identifies my home State of Washington and the surrounding region. And today salmon continue to be a vital part of our communities up and down the Pacific coast providing billions of dollars of economic activity and thousands of jobs. In Washington State, commercial fishing for salmon generated over \$26 million in revenue and supported over 500 jobs in 2006. That same year, Washington's sport fishing generated \$130 million in economic activity. And in Alaska, the salmon stronghold runs in Bristol Bay alone are estimated to support over 5,500 full-time jobs and direct economic expenditures of over \$3 million each year.

That is why I have worked so hard for the salmon recovery programs and funding, including the increase in the Pacific Coastal Salmon Recovery Fund. Since its inception in 2000, the Pacific Coastal Salmon Recovery Fund has allowed us to focus our efforts in various counties, conservation districts, and on average, remove over 200 barriers to fish passage and open up nearly 500 miles of

habitat each year. That is 2,200 barriers removed and over 4,000 miles of habitat restored. I will continue to fight to protect and increase the salmon recovery fund, but more needs to be done.

Current Federal salmon recovery efforts are focused heavily on salmon listed on the Endangered Species Act, basically seeking to restore what we have lost. While recovering depleted populations is essential, we cannot forget that it is also important to protect the healthy salmon populations we still have. For salmon stocks that are still healthy today, it is much smarter, more cost effective to preserve them now before their populations dip low and trigger the Endangered Species Act and their protections. Rather than waiting until after they have run into trouble, act now.

Ultimately, saving the Pacific salmon is not just about recovering threatened and endangered stocks, it is also about protecting healthy populations. That is why last year I introduced legislation that we are here to discuss today, the Pacific Salmon Stronghold Conservation Act of 2009. And I am proud to say that this legislation was introduced and cosponsored by every Senator from the Pacific coast states, including Senator Murkowski, Senator Murray, Senator Wyden, Senator Boxer, Senator Feinstein, Senator Merkley, and Senator Begich.

I am also pleased that a companion bill is making its way through the House of Representatives with Representative Mike Thompson as the lead sponsor and support of 42 cosponsors.

The Pacific Salmon Stronghold Conservation Act was written to achieve a simple goal: to ensure the survival of the Pacific salmon by making sure that our healthy salmon populations get the protection they deserve.

It is a stunning fact that the States of California, Idaho, Oregon, and Washington are roughly 20 percent of the salmon habit and support the salmon abundance. The State of Alaska, as a regional stronghold, produces more than one-third of all Pacific salmon in North America.

This legislation will protect these critically important wild salmon strongholds. By establishing a cooperative public/private salmon stronghold partnership, this bill will break down the old barriers between Federal, State, and tribal governments, private landowners, and non-governmental organizations. It will streamline and coordinate our efforts toward a unified, clearly defined, science-based approach for conservation of salmon stronghold populations. And it will establish a much-needed grant and technical assistance program to leverage private dollars in support of targeted, high-impact projects in the stronghold watersheds. Establishing this kind of voluntary, incentive-based program will bring people together to accelerate the highest priority conservation actions needed to shore up our network of healthy salmon populations, serving as a buffer against our future losses among vulnerable stock. Restoring the threatened and endangered salmon in the Pacific Northwest is an imperative as wild Pacific salmon are a true icon of western northern America. It is time to increase funding for recovery efforts but also essential that we bring into focus prevention. And it is time to adopt the kind of comprehensive solution that can solidify wild Pacific salmon's rightful place for generations to come.

We are going to turn to our witnesses. We are glad that Dr. Gordon Reeves, a Research Fish Biologist for the U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station from Corvallis, Oregon is with us. Welcome. Mr. Guido Rahr, President and CEO of Wild Salmon Center, Portland, Oregon; Ms. Sara LaBorde, Special Assistant to the Director for the Washington Department of Fish and Wildlife; and Mr. Joe Childers, Immediate Past President of United Fishermen of Alaska and the Co-Vice Chair of the Advisory Panel for the North Pacific Fishery Management Council. Welcome to you all and we are glad you are here.

I see my colleague and a cosponsor of this legislation. Senator Begich from Alaska is here. Senator Begich, would you like to make a statement before we turn to our witnesses?

Senator BEGICH. Thank you very much, Madam Chair. No. Let us go right to the witnesses. I think you summarized very well the importance of the legislation. And it is exciting to see this step moving down the road. So I will just look forward to witnesses and then some questions from that point, if that is OK.

Senator CANTWELL. Great. Thank you.

Dr. Reeves, welcome, and please pull the microphone up.

**STATEMENT OF DR. GORDON H. REEVES,
RESEARCH FISH BIOLOGIST AND TEAM LEADER,
PACIFIC NORTHWEST RESEARCH STATION,
U.S. FOREST SERVICE, U.S. DEPARTMENT OF AGRICULTURE**

Dr. REEVES. Thank you, Madam Chair, and members of the Committee. My name is Gordon Reeves, and I appreciate the opportunity to appear before you today to discuss the science that underlies the Salmon Stronghold Conservation Act of 2009.

I am a Research Fish Biologist with the PNW Research Station in Corvallis, and I have held that position for 27 years. I have published 75 papers on the freshwater ecology of Pacific salmon and trout in the Northwest and Alaska. I also had a short career as a commercial fisherman while I was in graduate school at Humboldt State University.

The primary focus of my testimony is on the science that underlies the salmon stronghold concept. Therefore, I will not be speaking to the bill itself.

Protecting populations and their ecosystems is a primary principle of conservation biology. Depressed populations and degraded ecosystems are much more difficult to conserve and recover than are productive, intact ones. Conservation, therefore, is most successful when proactive actions are directed at populations before they decline and ecosystems before they are degraded.

The establishment of a stronghold network is premised upon principles of systematic conservation design, and these principles include comprehensiveness, which is the extent to which the network protects the desired level of biodiversity and abundance; irreplaceability, the inclusion of areas or populations that are necessary to achieve the conservation goal; and efficiency, which is meeting the desired goals in the most effective manner while minimizing the amount of area involved.

Tools based on these principles have been developed by scientists from the Forest Service, the Wild Salmon Center, other NGO's, and

universities. And they will provide the ability to identify and develop a scientifically sound stronghold network.

In dealing with climate change, the potential effects of climate change are relatively minor compared to environmental variations native fish have faced historically. However, change is now occurring more rapidly than in the past and follows a period of extensive and fairly rapid ecosystem alteration. Consequently, these fish no longer have the intact network and the associated diversity of habitats and environmental conditions or the genetic and life history diversity potential to respond to changes that they did historically.

Creating networks of watersheds across large spatial scales could be a key component of providing opportunities for native salmon and trout to respond to these stressors. Salmonids are most likely to persist in such networks because they will provide a diverse habitat that allows for greater species, genetic and phenotypic diversity, and they will have the ability to absorb catastrophic disturbances without the loss of entire populations.

A network of strongholds that is distributed across the Pacific Northwest and Alaska will also provide important ecological services to the local communities and other areas.

The foundation of the salmon network approach is well embedded in principles of conservation biology and has the potential to help prevent further declines of native salmon and trout and the ecosystems in which they reside. Additional strongholds would complement and expand the existing network of strongholds which are generally limited in size and distribution and would increase the overall effectiveness of a network system. In the longer term, such a network would have a good potential to contribute to the persistence of strong populations, the recovery of depressed populations, and to provide a suite of ecological services to the local communities.

Thank you for this opportunity to testify, and I would be happy to answer any questions you might have.

[The prepared statement of Dr. Reeves follows:]

PREPARED STATEMENT OF DR. GORDON H. REEVES, RESEARCH FISH BIOLOGIST AND TEAM LEADER, PACIFIC NORTHWEST RESEARCH STATION, U.S. FOREST SERVICE, U.S. DEPARTMENT OF AGRICULTURE

Madam Chairwoman, Ranking Member and members of the Subcommittee, my name is Gordon Reeves. I very much appreciate the opportunity to appear before you today to discuss the science that underlies the Salmon Stronghold Conservation Act of 2009. I am a research fish biologist with the Pacific Northwest Research Station of the U.S. Forest Service in Corvallis, OR and have held this position for 27 years. I have a Ph.D. in fisheries science from Oregon State University and a Master of Science in fisheries from Humboldt State University. I also worked as a commercial salmon fisherman in northern California while I was in graduate school. I have published more than 75 papers on the freshwater ecology of various species of Pacific salmon in the Pacific Northwest and Alaska and on the impacts of land management activities on the freshwater habitats of these fish. I was involved with the development of options for managing Federal lands in the Pacific Northwest and Alaska and evaluating their effects on Pacific salmon (*Oncorhynchus* spp.) and other aquatic organisms.

The primary focus of my testimony is on the science that underlies the salmon stronghold concept therefore, I will not be speaking to the S. 817 itself. More than 29 percent of the estimated 1400 populations of native salmon and trout in the contiguous western United States have been lost (Gustafson *et al.* 2007). Currently, about one third are listed as threatened or endangered under the Endangered Species Act. As a result, the conservation of these fish is the focus of much effort by

scientists in Federal and state agencies, universities, NGO's, and private industry. Initial conservation efforts were directed at habitat units, such as pools and riffles, and small segments of streams. However, no fish species or population unit was recovered sufficiently to be removed from the Endangered Species list and these approaches were judged to be ineffective (Williams *et al.* 1989). In the early 1990s, Moyle and Yoshiyama (1994) advocated for the focus shifting to watersheds with a particular emphasis on intact watersheds. It was also recognized that recovery and protection efforts should focus on ecological processes, and not solely on in-channel conditions (*e.g.*, Reeves *et al.* 1995, Gustafson *et al.* 2007). These approaches have been echoed by several researchers and managers since that time, but there are few examples of where this approach has actually been applied, particularly on a large spatial scale. Perhaps the best examples are the key watersheds, which are part of the Aquatic Conservation Strategy of the Northwest Forest Plan (NWFP) that guides management on Federal lands within the range of the northern spotted owl (*Strix occidentalis caurina*). Key watersheds had currently good habitat, the best potential to respond to restoration, or were municipal water supplies (Reeves *et al.* 2006). The purpose of the former two types was to aid in the recovery of listed fish. Ten years after the implementation of the NWFP, the proportion of key watersheds (70 percent) whose condition improved at a greater rate than that of non-key watersheds (50 percent). The primary reasons for this were: (1) restoration efforts were focused in the key watersheds rather than dispersed; and (2) watershed analyses provided a basis for any management activities undertaken and helped reduce the risk of negative consequences.

Principles of Conservation Biology

Protecting populations and their ecosystems is a primary principle of conservation biology. Conservation is most successful when proactive actions are directed at protecting populations before they decline, and protecting ecosystems before they are degraded (McGurrin and Forsgren 1997), which is the foundation of a stronghold strategy. Populations that are in decline are much more difficult to conserve and to recover than are productive, intact ones. Focusing efforts on intact populations, where they exist, is a prudent component for the long-term conservation of native salmon and trout (Gustafson *et al.* 2007).

The identification and selection of a stronghold network is premised on principles of systematic conservation design, which are well established in the scientific literature (see Soulé and Terborgh 1999). These include: (1) comprehensiveness—the extent to which the network protects the desired level of biodiversity and abundance; (2) irreplaceability—the inclusion of areas or populations that are necessary to achieve the conservation goals; and (3) efficiency—the network is designed to be the most efficient manner that achieves the conservation goals while minimizing the area involved. An integrated suite of planning tools based on these principles has been developed by scientists from the Wild Salmon Center, other NGO's, the Forest Service, and universities. These tools can provide stakeholders and other interested parties the ability to identify and develop a scientifically sound stronghold network.

Native salmon and trout in the Pacific Northwest and Alaska occupy a wide geographic range over a wide variety of environmental conditions. The fish are uniquely adapted to local conditions, and it is difficult for populations from one area to survive in other areas (Waples 1991). Examples of local adaptation include resistance to disease, timing of return to freshwater, and size and age at maturity (Hodgson *et al.* 2009, Quinn 2005). These differences among populations are recognized by responsible management and regulatory agencies and in the status designation under the Endangered Species Act. As a result, it is important that the design and establishment of a stronghold network be focused at ecoregional levels in order to maintain this variability of locally adapted populations and to have the greatest chance of success.

The Challenge of Climate Change

The potential impacts of climate change pose a threat to native salmon and trout, particularly weak populations, in the Pacific Northwest and Alaska. These fish are particularly vulnerable because of their dependence on both freshwater and marine ecosystems. Potential impacts in the marine environment include: (1) changes in the thermal regime and timing and intensity of upwelling; and (2) increased acidification. Likely impacts on freshwater ecosystems include: (1) alteration of flow and temperature patterns; and (2) more frequent disturbances such as wildfire and drought (Hamlet and Lettenmaier 2007). The primary cause of decreasing summer flow is increasing air temperatures, which are decreasing snowpacks and melting existing accumulations earlier in the spring (Regonda *et al.* 2005; Stewart *et al.* 2005). As a result, streams runoff 1–3 weeks sooner than they did historically

(Regonda *et al.* 2005; Stewart *et al.* 2005) and subsurface aquifers provide less groundwater for stream flow late in the summer and early fall (Hamlet *et al.* 2005). There will be wide variation in the expression of potential impacts of climate change within and among watersheds in any given area. Additionally, there will be large variation among regions. The average annual air temperature increase in the West has been 0.8°C; warming rates have been faster at higher elevations and more northerly latitudes, and slower at lower elevations and southern latitudes (Diaz and Eischeid 2007).

The likely consequences of climate change for salmon and trout include changes in the: (1) behavior and growth of individuals (Neuheimer and Taggart 2007); (2) phenology, growth, dynamics, and distribution of populations (Hari *et al.* 2006; Rieman *et al.* 2007); (3) persistence of species and fish communities (Hilborn *et al.* 2003); and (4) functioning of whole ecosystems (Moore *et al.* 2009). The vulnerability of salmon and trout species and population units to climate change will depend on the characteristics of the species or population, and local environmental conditions, as well as past habitat alteration, fragmentation, and loss (Hodgson *et al.* 2009). Larger, more productive populations have a better likelihood of adapting to climate change, in part, because of the inherent genetic and phenotypic diversity within them (Hodgson *et al.* 2009).

The potential effects of climate change are relatively minor compared to the environmental variation native fish have faced over time (Waples *et al.* 2009). However, change is occurring more rapidly than many of the past changes (IPCC 2007) and is following a period of extensive and fairly rapid ecosystem alteration. Consequently, these fish no longer have the historical intact networks and diversity of habitats and have reduced genetic, life-history, and evolutionary potential to respond to the impacts of climate change.

Conserving and creating networks of watersheds across large spatial scales could be a key component of providing opportunities for native salmon and trout to respond to a number of stressors. Salmonids are most likely to persist in larger and more complex habitat networks (Fausch *et al.* 2006, Greene *et al.* 2009). Large networks are more likely to provide diverse habitat required over the life span of these fish, the complexity and area to absorb catastrophic disturbances without loss of entire populations, and greater species, genetic and phenotypic diversity (Fausch *et al.* 2009).

A network of strongholds that is distributed across the Pacific Northwest and Alaska will also likely provide important ecological services to the local communities. These include protection of other aquatic species, production of clean water for drinking and irrigation, natural flood control, sites of carbon sequestration, and opportunities for recreation.

Conclusion

The foundation of the salmon stronghold network approach is well embedded in the principles of conservation biology and has the potential to help prevent further declines of native populations of salmon and trout and the ecosystems in which they reside. Additional strongholds would complement and expand the existing network of strongholds, which are generally limited in size and distribution, and would increase the overall effectiveness of the network. In the longer term, such a network would have good potential to contribute to the recovery of populations that are currently depressed. This network would likely be the base for Pacific salmon and other native fishes to respond to the challenges of adapting to climate change and where important ecological services are provided to local communities, the region, and the Nation.

Thank you for this opportunity to testify. I would be happy to answer any questions.

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Senator CANTWELL. Thank you, Dr. Reeves.

We will just go down the line, and we will wait until all the witnesses have given their testimony. Then we will go to questions.

So, Mr. Rahr, welcome. Thank you for being here. Thanks for all the work that the center has been doing, and we look forward to your comments.

**STATEMENT OF GUIDO RAHR, PRESIDENT AND
CHIEF EXECUTIVE, WILD SALMON CENTER**

Mr. RAHR. Madam Chair, members of the Subcommittee, I very much appreciate the chance to testify today. In my testimony, my views are of the President of the Wild Salmon Center. We are an international, science-based conservation organization.

The CHAIRMAN. Mr. Rahr, just bring the microphone a little closer to you. Thank you.

Mr. RAHR. My name is Guido Rahr. I am the President of the Wild Salmon Center, an international, science-based conservation organization dedicated to protecting wild salmon ecosystems across the north Pacific.

In my testimony today, I will briefly explain why enacting the Salmon Stronghold Act is necessary for the survival and health of wild salmon.

First of all, I want to emphasize that there are many important endangered species in the Pacific Northwest, but wild salmon have a disproportionate impact on the health of both the ecological and social human communities where they live. Scientists have a term for species that have this kind of impact, and it is called the "keystone species." Wild salmon are a keystone species for the watersheds that flow into the north Pacific. They bring in tremendous amounts of marine nutrients which support over 100 species that depend upon wild salmon, the runs that have come in and spawned. They are also one of the top three revenue-generating seafood products, supporting tens of thousands of jobs and generating \$3 billion in personal income. So salmon are really important for the health of the ecological and economic systems of the north Pacific.

Also, salmon really unite the people of the north Pacific. We and our fellow nations across the north Pacific are part of the salmon ecosystem. We identify ourselves with salmon. They are part of our way of life and they really represent the north Pacific. They are very much an important icon in our lives.

Now, currently globally we are losing the battle to save wild salmon populations over much of their range. Wild salmon have disappeared from much of Europe and the eastern United States. Japan has no more healthy wild salmon runs. It appears that the Korean peninsula is in the same shape. And now southern British Columbia is seeing their populations in some cases faltering. The Fraser River sockeye collapsed last year, for example. In the western United States, salmon have disappeared from 40 percent of their native range, and one-third of our populations are now listed for protection under the Endangered Species Act.

Despite a concerted effort to recover salmon, no species has been removed yet from the Endangered Species list.

Now, today in the Pacific Northwest, we are at a crossroads. There are two big driving forces that are going to determine our ability to protect salmon over the long run, and one is the impacts of climate change and the other is the fact that our human popu-

lation is doubling roughly every 40 years. So in 40 years, we could have twice the impacts and competition for the resources that salmon need.

Unless we are able to implement a realistic, long-range strategy to protect our rivers from these and other threats, we will likely join a growing number of places in the world where wild salmon and all that they symbolize are just a memory.

But we still have some healthy wild salmon populations, and these are the strongholds, places like Alaska's Bristol Bay, the Olympic Peninsula of Oregon, and northern California, the Smith River, for example, in northern California.

The key is going to be prevention, being able to anticipate the threats that these watersheds face and implement programs to protect them over the long term.

Unfortunately, our current governance structure, which is constructed to respond mostly to the crises of the day, is ill-equipped to invest and lead us to prevent the threats that we see before us. The main direction to the agencies is driven by the Endangered Species Act. We need, in addition to that work, an additional approach to protect the strongholds, a preventative approach. The Salmon Stronghold Act represents precisely the leadership that we need. The Act establishes a critical missing component in Federal salmon policy, providing Congressional direction to focus Federal resources on the conservation of these strongholds.

History has shown that it will be less expensive to act now than to invest heavily later in having to recover these populations. If we succeed, we will be leaving our children some of the most beautiful rivers and a miracle of healthy wild salmon runs and something they will be very grateful for.

In conclusion, I want to express my support for the leadership of Senator Cantwell in introducing the Salmon Stronghold Conservation Act, which has broad support throughout the western United States, and we stand ready to do anything we can to help pass this Act into law.

Thank you very much.

[The prepared statement of Mr. Rahr follows:]

PREPARED STATEMENT OF GUIDO RAHR, PRESIDENT AND CHIEF EXECUTIVE,
WILD SALMON CENTER

Madam Chairman, members of the Committee, I appreciate the opportunity to appear before you today to provide my views on the Pacific Salmon Stronghold Conservation Act ("Salmon Stronghold Act"). My name is Guido Rahr and I am the President and Chief Executive of the Wild Salmon Center, a science-based, international conservation organization dedicated to protecting the healthiest and most productive wild salmon ecosystems across the Pacific Rim. I was the first full-time staff member of Wild Salmon Center at its inception in 1998 and initiated the organization's effort to identify and protect the remaining "strongholds for native salmonid fish along the Pacific Rim," a very new concept in salmon conservation at the time. I have a Masters of Environmental Studies from Yale University and 22 years of experience developing programs for regional and international conservation organizations, including Oregon Trout, the Rainforest Alliance, the United Nations Development Programme, and Conservation International. I am the founder of the World Conservation Union Salmon Specialist Group, led the creation of new salmon and river conservation organizations in the United States and Russia, and have written numerous publications on salmon conservation, most notably "A Proactive Sanctuary Strategy to Anchor and Restore High Priority Wild Salmon Ecosystems" (Rahr, *et al.* 2006).

In my testimony today, I will explain: (1) why enacting the Pacific Salmon Stronghold Conservation Act is critical to maintaining and increasing the long-term abundance and diversity of wild Pacific salmon in North America, and (2) how U.S. leadership can stimulate action from other Pacific Rim salmon-bearing nations, whose cooperation is vital to protect our salmon fisheries. If there is one message from my testimony today that I hope stays with you, it is this: Congressional direction is absolutely necessary to implement a winning, science-based salmon conservation strategy. Enacting the Pacific Salmon Stronghold Conservation Act (“Salmon Stronghold Act”) will provide the critical missing link in current salmon conservation and management policies by harnessing public and private efforts to protect North America’s healthiest wild salmon rivers, and the communities and wildlife that depend on them.

I want to acknowledge the extraordinary leadership and support of the bill’s co-sponsors, Chairwoman Cantwell and Senator Murkowski—two Senators who were among the first to recognize the value of preventative action to avoid paying billions of dollars in watershed restoration costs down the road. I also want to commend the other six original co-sponsors of the bill, which included each and every West Coast Senator.

The Economics, Ecology and Culture of Wild Salmon Ecosystems

Healthy wild salmon ecosystems provide myriad ecological, economic and cultural benefits. Ecologically, salmon are what is known as a “keystone” species, a key link in the food web upon which over 137 other species depend, including bears, eagles, orcas, and other wildlife (Cedarholm, *et al.* 2000). Salmon even provide valuable nutrients to our forests and plants through the decomposition of their nitrogen-rich carcasses.

Salmon are also an “indicator” species, informing us about the health of our freshwater and marine systems. Not coincidentally, many of our most productive salmon rivers provide our communities with critical ecological services, such as clean drinking water, flood control, irrigation and pollution filtration. Abundant and diverse salmon populations tell us that our system is healthy and will continue to provide those and other valuable services.

Salmon are a highly migratory and transboundary species, which have a tremendous impact on the ecological health of communities around the northern Pacific Rim. They create thousands of truly sustainable jobs, generating billions of dollars of economic value, while providing an important component of food security as they are a nutritious and natural source of protein for local consumption and export. Accordingly, salmon require international cooperation with other salmon-bearing nations across the Pacific Rim.

Finally, more than any other species, salmon connect the people to the oceans and rivers of the Pacific Rim. They are deeply embedded in our identity, and are a primary source of food and cultural identity for native peoples across the Pacific Rim.

A More Strategic Approach to Salmon Conservation

Today, in the western United States, we are at a crossroads. Salmon are now extinct over 40 percent of their native range, and many other salmon populations have declined to the point that they are protected under the Federal Endangered Species Act. Fortunately, there are still river systems that are home to relatively healthy wild salmon and steelhead populations. These are the “salmon strongholds”: the crown jewels of productive salmon ecosystems. While they are the best of what we have left, without pro-active planning and management, they may be next in line to suffer the threats that have caused the decline of so many other salmon populations.

Scientists predict that the impacts of climate change will both decrease the flow of water in our rivers, and heat them to the point that many systems will not be habitable for salmon and steelhead. In addition to the effects of climate change, the human population of the Pacific Northwest is predicted to double by the year 2040, potentially doubling not just the demand for the fish themselves, but doubling the demands on the clean water and healthy forests needed to support wild salmon runs.

Unless we are able to implement a realistic long-range strategy to protect our rivers from these and other threats, we likely will join the growing number of places in the world where wild salmon and all that they symbolize and provide are just a memory. Our ability to learn from the past and establish a comprehensive and strategic approach to salmon conservation will likely determine whether future generations can continue to enjoy the many values these extraordinary species embody.

The Pacific Salmon Stronghold Conservation Act of 2009

Today, our scientists have a deeper understanding of what wild salmon need to thrive and prosper than ever before. Reduced to its most elemental components, salmon require:

1. Sufficient natural and healthy functioning river systems, estuaries, and marine habitat to live out their life cycle;
2. Harvest management that enables enough wild salmon to return to the spawning grounds of their home rivers, and protection from the ecological impacts of large scale releases of juvenile salmon from hatcheries; and
3. Genetic diversity to build resilience, adapt to environmental conditions, and evolve.

Current Federal salmon policy only partially addresses these basic needs, largely through the Endangered Species Act (recovery of salmon populations listed as threatened or endangered; implemented through the Pacific Coastal Salmon Recovery Fund), the Magnuson Stevens Fisheries and Management Reauthorization Act (setting national standards to conserve and manage anadromous and other high seas migratory species to prevent overfishing, rebuild overfished stocks, and facilitate long-term protection of essential fish habitats), and the U.S.-Canada Pacific Salmon Treaty (promoting international cooperation for bi-national salmon harvest allocations and a ban on high seas salmon fishing).

One critical missing component in this policy is a Federal focus on the conservation of healthy wild salmon ecosystems—salmon strongholds—as a preventative, proactive approach. We have invested millions of dollars in salmon recovery efforts, but these efforts alone will not be sufficient to prevent the need for future listings or safeguard against future declines. It is also important to note that while salmon recovery is a vital element of our Federal salmon conservation strategy, no salmon population to date has been recovered and removed from the Endangered Species list. While recovery proceeds, we must ensure that our healthy wild salmon populations remain intact. This approach will save hundreds of millions of dollars in future restoration costs and emergency funding.

The Pacific Salmon Stronghold Conservation Act of 2009 creates this essential policy by directing Federal resources toward conservation of the healthiest and most productive wild Pacific salmon strongholds in North America.

Protecting Strongholds Implements a Key Principle of Conservation Biology—Safeguard Core Centers of Abundance and Diversity

Approximately two-thirds of historic salmon populations persist around the Pacific rim, and wild Pacific salmon remain incredibly diverse, with at least 50 evolutionary significant units in just the lower 48 (Augerot, 2005). Yet, only a small percentage of globally significant wild salmon rivers currently enjoy protection. For those that remain unprotected, a wide range of conservation strategies must be employed to sustain their productivity (Pinsky, *et al.* 2009).

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

1. Identifying “stronghold” rivers based on levels of abundance and diversity of wild salmon and steelhead populations within each salmon “ecoregion” throughout the species North American range;
2. Optimizing the most efficient combination of rivers necessary to conserve the greatest range-wide abundance and diversity; and
3. Investing in the “highest conservation value” actions in strongholds to maintain ecological function by addressing factors that limit the salmon population health and prevent emerging threats.

There is broad agreement among scientific colleagues in and outside of government that the identification and protection of a portfolio of salmon strongholds represents a critical plank in any broader salmon conservation and management strategy.

Cooperative Conservation—a Public-Private Model for Maintaining Healthy Watersheds

Federal land managers and regulators often have responsibilities or interests in coastal watersheds, but seldom does a single government entity have jurisdiction or management authority over an entire watershed or salmon ecosystem. It is more often the case that watersheds are “managed” by multiple entities, including Federal and state agencies, Tribes, and, of course, private landowners and water man-

agement authorities. Coordinating these entities for a shared purpose is complex, but absolutely necessary to ensure watershed function and resilience.

The Salmon Stronghold Act brings all of these players to the table around voluntary, incentive-based efforts to ensure that salmon strongholds retain and increase the benefits they currently produce. Wild Salmon Center and its conservation partners have worked closely with local communities to protect watersheds through many strategies and tools, including supporting sustainable fisheries and working landscapes. Leveraging the efforts of non-governmental bodies who champion these models will make Federal policy more effective and has the potential to generate significant private resources.

Several conservation organizations, including those participating in the North American Salmon Stronghold Partnership (Stronghold Partnership), have worked closely with cities, towns, Tribes, timber companies, farmers, ranchers, and commercial and recreational fishers to find mutually beneficial solutions to complex land management and resource issues. This approach is producing encouraging results in areas once paralyzed by dispute and mistrust.

Expanding these efforts beyond their current recovery focus to find voluntary solutions to conserve healthy wild salmon rivers should be encouraged and enabled by Federal policymaking. The Salmon Stronghold Act will create the framework enabling key stakeholders to coordinate, cooperate, and innovate to implement science-based conservation and management plans in salmon strongholds.

The Model Works—The North American Salmon Stronghold Partnership

Now in its fourth year, the Stronghold Partnership has demonstrated that a broad and diverse group of stakeholders is dedicated to ensuring that strongholds continue to provide valued ecological, economic, and cultural benefits. The first step in this partnership has been an ongoing effort among a diverse group of salmon experts to identify strongholds. Collaborating closely with Federal and state agencies and non-governmental organizations represented on the Stronghold Partnership Board, salmon experts operating at the watershed level have worked diligently to score and rank their wild populations. This collaborative effort, which continues to take place throughout the salmon bearing states, has not only ensured that strongholds are identified accurately but also yielded a broad understanding among local partners of the goals of the Salmon Stronghold Act.

The “watershed-level” buy-in that this collaborative process has fostered allows stakeholders in identified strongholds to leverage stronghold designation, and access resources provided under the Act to achieve local conservation goals. This has already been demonstrated as partners in several pilot strongholds have actively sought to participate in the program, and begun to leverage stronghold status to identify critical needs, determine conservation strategies, and implement innovative projects. Technical and financial resources made available as a result of the Stronghold Act will provide vital support to these local and regional partners, ensuring that preventative strategies reach the ground.

The Salmon Stronghold Act—What Difference Will It Make On The Ground?

Given the significant Federal resources already invested in salmon conservation, partners introduced to the Stronghold Partnership regularly ask what needs the Partnership—and the Act which supports it—meet that cannot be met through other programs.

- First and foremost, the Board will focus resources provided under the Act on activities that promote the development and implementation of *prevention-based strategies* in strongholds. These proactive approaches to salmon conservation will explicitly complement the restoration-based principles advanced through current Federal investments in recovery.
- Second, the Salmon Stronghold Act authorizes technical and financial support to advance *cross-cutting, programmatic initiatives*. Programmatic initiatives include the development and refinement of conservation policies and management strategies that address threats and reduce limiting factors across multiple strongholds.
- Third, the Act will direct the Federal agencies to help lead and coordinate the development and implementation of prevention based strategies and programmatic initiatives.

Prevention-based Strategies in and across Strongholds

In the Pacific Northwest, partners in several salmon stronghold river basins have already identified specific needs that must be met in order to prevent the decline of healthy watersheds and strong salmon populations. However, the very fact that these rivers are “healthy” today has made it extremely challenging for local partners

to garner the resources necessary to meet these needs. For example, the magnificent Smith River in Northern California has united a broad and diverse group of stakeholders to maintain its outstanding water quality and habitat, yet the Smith rarely qualifies for Federal or state funding because it has few species (one) listed as endangered, and it is not included on the 303(d) list of impaired water bodies. As a result, because the basin is “too healthy”, local stakeholders cannot obtain sufficient funding to even conduct baseline escapement monitoring, which is vital to determining the amount of salmon returning from the ocean to the river to spawn. This lack of funding impedes fish managers’ ability to set conservation-minded harvest levels and establish science-based escapement targets. These conditions prohibit the State from ensuring that appropriate management strategies are in place to conserve strong populations.

The extraordinary coastal rivers of Washington’s Olympic Peninsula provide another example of this gap in Federal salmon policy. Home to five species of Pacific salmon, which inhabit some of the healthiest watersheds in the lower 48 states, no comprehensive watershed plan exists to conserve the Peninsula’s salmon populations. Localized plans, such as those formulated by the Quileute and Quinault Tribes and local Lead Entities, are severely underfunded because partners cannot leverage the crisis conditions necessary to prompt Federal investment.

Only through monitoring and careful planning can partners in strongholds identify the preventative measures necessary to safeguard the health of functioning watersheds. This Act will enable partners to garner sufficient funding to identify conservation needs in stronghold basins and ensure that the management strategies are in place to maintain currently strong salmon populations into the future. If prevention is not supported now, emerging threats like development and climate change will surely require that we pay more in the future to restore what has been lost.

Programmatic Initiatives to Address Challenges across Multiple Basins

While watershed level conservation strategies are critical, many challenges faced by salmon managers are more effectively addressed through policies which accelerate the development and implementation of conservation strategies across a much larger range. This approach is sorely lacking within the current portfolio of Federal salmon conservation grant programs, which focus heavily on implementing strategies at the watershed scale (for example, PCSRF funds are allocated on a state by state basis, each state allocates funds to recovery basins for habitat protection and restoration actions, and priorities are determined by each recovery basin, *e.g.*, Lead Entities in WA.) The Salmon Stronghold Act advances a broader range-wide approach through its support for *programmatic initiatives*. Programmatic initiatives catalyze innovative approaches to proactively respond to emerging threats, reform inefficient policies, and integrate management strategies. Three examples of these are described below. Note the broad range of challenges presented in these examples, which indicate the potential of programmatic initiatives to address both the root causes of conditions that limit populations today as well as threats to populations in the future.

Climate Change. Perhaps no greater threat challenges the health of Pacific Salmon across their range than climate change. The establishment of a network of salmon strongholds supported under the Salmon Stronghold Act will ensure that strongholds are maintained as core centers of abundance and genetic diversity. Maintaining diversity, scientists tell us, may be the key to ensuring species’ resilience over the long-term in the face of changing watershed conditions. Although the Federal Government currently supports climate change research, no forum and few resources exist to translate ongoing climate change research into policies that are targeted to wild salmon conservation. For example, current research into “downscaling” regional climate change impacts will be vital to helping researchers evaluate impacts across strongholds. Because of its focus on inter-agency coordination, the Stronghold Partnership provides an extraordinary forum to apply this emerging research to develop and recommend the policies necessary to safeguard strongholds and promote resilience among strong wild salmon populations.

Innovative Demonstration Projects. Cross-cutting initiatives funded under the Act may include pilot projects that, if replicated successfully, would address challenges faced by multiple strongholds. On the north coast of Oregon, for example, strong salmon populations are threatened by unsustainable harvest levels in the Tillamook-Clatsop State Forest, an area encompassing over one half million acres of extraordinary salmon habitat. The high harvest is driven by the reliance of local county budgets on revenues derived from logging. A broad consortium of stakeholders convened by Wild Salmon Center is working with local and state leaders, industry, and NGO partners to identify revenue that could be generated from non-

extractive uses of the forest. By recognizing the value of—and generating revenues from—watershed services like clean water and carbon sequestration, local counties could offset decreases in timber receipts resulting from reductions in harvest to sustainable levels.

This promising idea has been applied to other resource management challenges that have not involved salmon conservation. Unfortunately, funding to further develop the concept in Oregon and elsewhere is limited because few, if any, Federal or state grant programs can provide the funds necessary to demonstrate the concept. Because of the Stronghold Partnership's commitment to support policy innovations that address the root causes of watershed degradation, this approach could be demonstrated in Tillamook and have widespread applications across other strongholds.

Policy Reform to Accelerate Conservation. Countless local, state, and Federal resource management policies have unintended adverse impacts on the stewardship of salmon strongholds. One example is the permitting process which seeks to protect aquatic and wetland resources from development but often impedes locally-led habitat protection and restoration efforts. Under provisions of Section 7 of the Endangered Species Act, a Federal agency that funds or authorizes activities that may affect a listed anadromous fish species must consult with the National Marine Fisheries Service to ensure that proposed actions are not likely to jeopardize the continued existence of the species. While this regulation is necessary, its one-size-fits-all approach makes no accommodation for thoroughly reviewed activities proposed to enhance ecosystem function. Consequently, the permitting process often obstructs restoration project implementation due to the added expense and/or unmanageable duration of the application and review processes. Likewise, sections 401 and 404 of the Clean Water Act, which govern projects impacting wetlands and water quality respectfully, similarly do little to distinguish between permitting for potentially harmful development activities and habitat enhancement projects. These permitting processes often lead to significant delays, cost over-runs, and sometimes cancellation of valuable ecosystem enhancement projects.

In recent years, conservation organizations, Federal agency personnel, and even Members of Congress have proposed streamlining the permitting processes to support conservation projects. Similar to the challenge of funding the activities described above, however, these efforts have been difficult to sustain among local watershed groups who are critical to the success of the process. If deemed a priority by the Board, funds provided under the Stronghold Act could support cooperative efforts underway in the states to streamline permitting, thereby accelerating the rate of conservation in strongholds.

Enhanced Coordination

Since the life cycle of salmonids crosses public and private ownerships, political jurisdictions, and diverse ecosystems, a coordinated approach among Federal, state, and tribal governments, landowners, and non-governmental organizations is critical to successfully conserving and managing strong salmon populations. Unfortunately, Federal partners in stronghold basins currently have little guidance or ability to lead strategies like those described above, focusing instead on the reactive approaches to salmon conservation due to current mandates. With congressional direction under this Act, Federal partners who are now participating enthusiastically in the Stronghold Partnership will not be forced to leave the table to address recovery priorities, as proactive conservation and management of healthy wild salmon populations will become a complementary mandate to recovery for the agencies.

This Act, therefore, will make existing efforts to protect healthy salmon ecosystems more effective by coordinating the entire family of Federal agencies and departments to take actions compatible with maintaining core areas of wild salmon abundance and diversity. For example, in the Pacific Northwest, the U.S. Forest Service is implementing an innovative policy to identify and manage "key watersheds" to maximize and protect valued ecological and economic resources produced from these areas. Several key watershed designations include salmon strongholds, yet many of these watersheds encompass other Federal and state landowners which do not adopt such preventative and far sighted strategies. Coordinated Federal leadership in these basins would amplify the benefits of the Forest Service's policy over a broader scale, increasing the efficiency and effectiveness of basin-wide conservation planning.

In addition, many landowners in stronghold basins are faced with a complex and overlapping array of existing incentive-based programs administered by multiple Federal and state agencies. This legislation will provide a forum, the Stronghold Partnership Board, for partners to coordinate these programs to bundle and deliver incentives in a more efficient and results-oriented manner.

International Cooperation

This legislation will also help the U.S. promote the stronghold approach across the Pacific Rim. This is extremely important since salmon are highly migratory, with some species spending portions of their life history in the waters of other Pacific Rim nations. Because environmental conditions or human actions across the Pacific can have an impact on Chinook returns in Alaska, for example, salmon represent a global “canary in the coal mine,” integrating freshwater, estuarine and marine habitats into one enormous ecosystem. These interdependencies are recognized by the North Pacific Anadromous Fish Commission and the U.S.-Canada Pacific Salmon Treaty.

The Salmon Stronghold Act will complement these official government bodies by establishing a civil society-led initiative to coordinate the creation of a Pan-Pacific network of salmon strongholds, stretching from Japan through the Russian Far East across British Columbia to California. This network will ensure the long term viability of wild salmon over a much larger spatial scale and will serve as a forum to share lessons learned and leading edge conservation science tools and methodologies with other nations. With strong Federal, state, tribal and non-governmental participation, this network will share experiences directly with local citizens in stronghold basins throughout the North Pacific.

Other Pacific salmon countries are beginning to recognize the need to protect salmon strongholds and engage in the Partnership’s efforts to conserve them. For example, Canada’s Pacific Fisheries Resource Conservation Council adopted the stronghold approach and officially joined the Stronghold Partnership Board. Voluntary, incentive-based protection efforts are now underway in British Columbia’s Harrison River, which was recognized as a salmon stronghold pilot site in February 2010.

U.S. leadership in establishing a stronghold policy and program will help recruit supporters from other salmon-bearing nations, including promising initiatives underway in the Russian Far East and northern Japan. At the triennial “State of the Salmon” international congress, several leading voices for salmon conservation and sustainable management from other nations showed great interest in pursuing similar policies based on the proposed Salmon Stronghold Act legislation, so its enactment would further those efforts.

Conclusion

Salmon strongholds offer our greatest hope of preserving the long term viability of wild salmon populations and the economic, ecological, and cultural values they sustain. In the face of climate change, development, and countless other threats on the horizon, Federal leadership through the Salmon Stronghold Act presents a long overdue approach to stem the tide of species extinction and loss. If we succeed, we will be leaving our children some of the most beautiful rivers and the miracle of healthy wild salmon runs, returning to the clear waters of home as they have for millions of years.

I would like to express my support and appreciation for the leadership of Senator Cantwell in sponsoring this important legislation. The Salmon Stronghold Act has broad support throughout the western United States and we stand ready to do anything we can to help pass this Act into law. Thank you very much.

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Senator CANTWELL. Thank you, Mr. Rahr, and thank you for your testimony.

Ms. LaBorde, thank you for being here, and we look forward to your comments.

**STATEMENT OF SARA LABORDE,
SPECIAL ASSISTANT TO THE DIRECTOR,
WASHINGTON DEPARTMENT OF FISH AND WILDLIFE;
AND CHAIR, SALMON STRONGHOLD PARTNERSHIP**

Ms. LABORDE. Madam Chair and members of the Committee, I appreciate the opportunity to appear. My name is Sara LaBorde, and I serve as Special Assistant to the Director of Washington Department of Fish and Wildlife, and I chair the North American Salmon Stronghold Partnership.

My primary responsibilities at the department include statewide salmon recovery and implementation of hatchery and harvest reform.

Today, I would like to share with you my perspective as a state fish and wildlife manager and someone who is engaged in trying to ensure that we have healthy salmon populations into the future.

Ten years ago, as you know, the State of Washington faced the listing of salmon and steelhead populations throughout both Puget Sound and the Columbia Basin. The listing set in motion the most comprehensive and challenging recovery planning effort every accomplished in the United States.

And since then, much has been accomplished that we can be proud of and hopeful for. There are six NOAA-approved salmon recovery plans built from the ground up involving literally thousands of citizens, local governments, State agencies, Federal agencies, citizens, and tribes. There are local systems in place developing, prioritizing salmon recovery projects to improve their watersheds. And throughout the Northwest, communities have developed a hands-on understanding that it takes working landscapes of farms and forests, protected critical areas, smart growth to deliver economic ecological benefits to their citizens.

But with all of that, these communities have shown that they remain determined to demonstrate that they can live side by side with wild salmon. And while Federal policy and implementation of recovery plans keeps the focus on rebuilding the weakest links, it assumes that our most productive and healthy rivers are in no need to help to continue their role of sustaining our greatest salmon populations.

Now, the Stronghold Act calls us to move in front of the listing curve, to protect and ensure that our most productive and healthy rivers stay that way. It calls us to complement recovery with effective preventive measures to ensure current economic benefits continue and to avoid the additional costly restoration in the future.

As Chair of the North American Salmon Stronghold Partnership, I would like to tell you firsthand how encouraged and optimistic I am after seeing the enthusiasm, the commitment, the broad-based support of uniting public and private efforts to keep strongholds productive and healthy. We have met with tribal leaders, farmers, ranchers, local government officials, commercial recreational fishermen, hunters, conservationists. We hear one constant theme, that these places are healthy because the vast majority of people who live, work, and recreate there value them.

The Stronghold Act includes these important stronghold watersheds and communities in our salmon recovery picture. It builds the tools and support they need to be successful.

We support the Act for a number of reasons.

One, it is not duplicative. It builds on our history and capitalizes on the decade's work and the current delivery and accountability system.

It works at the watershed level and requires local buy-in, using strong science and having local stakeholders opt in to participate.

It establishes a multi-State organization to address issues that cannot be dealt with watershed by watershed, and it gets at larger more pervasive issues like climate changes, as well as what does it really take to keep landscapes working.

It accelerates an integrated approach that we have learned is the only way to deal with salmon recovery, which is to involve habitat hatcheries, harvest, and hydro managers to develop solutions.

It furthers the voluntary incentive-based approach that we know works and it leverages private dollars toward highest priority conservation actions.

And last, it enacts Federal policy to identify and protect salmon strongholds. It completes the picture of salmon conservation and management.

So I urge you to join every West Coast State and the diverse and growing number of local, regional, and national organizations in supporting the Pacific Salmon Stronghold Conservation Act of 2009 by passing this bipartisan bill out of subcommittee.

Thank you for this opportunity to testify. I would be glad to answer any questions later.

[The prepared statement of Ms. LaBorde follows:]

PREPARED STATEMENT OF SARA LABORDE, SPECIAL ASSISTANT TO THE DIRECTOR, WASHINGTON DEPARTMENT OF FISH AND WILDLIFE; AND CHAIR, SALMON STRONGHOLD PARTNERSHIP

Madam Chairman, members of the Committee, I appreciate the opportunity to appear before you today to provide my views on the Pacific Salmon Stronghold Conservation Act (S. 817).

My name is Sara LaBorde and I serve as Special Assistant to the Director of Washington Department of Fish and Wildlife ("WDFW") and Chair of the Salmon Stronghold Partnership. My primary responsibilities at the Department of Fish and Wildlife concern statewide salmon recovery and hatchery and harvest reform implementation. Prior to this, I served as Regional Director for WDFW's Coastal and Hood Canal region, Special Assistant to the WDFW Commission, as well as the Public Involvement Coordinator. I have worked for WDFW for over twenty years. However, I began my career with the Wisconsin Department of Natural Resources restoring trout streams and improving state forestlands. Before moving to Washington, I spent 3 years with the Oklahoma Department of Wildlife Conservation starting their wildlife education program and Project WILD.

Today, I would like to share with you the perspective from a state fish and wildlife manager and someone who has been engaged with the Salmon Stronghold Partnership from the outset. Principally, I hope to address:

1. The need and opportunity to "complete the picture" in salmon management and conservation by explicitly supporting voluntary, incentive-based protection and restoration of our healthiest remaining wild salmon populations; and
2. How the Pacific Salmon Stronghold Conservation Act of 2009 ("Salmon Stronghold Act") will assist Washington State and others' efforts to integrate fish management and conservation into a comprehensive and holistic "All H" framework.

Federal Policy to Identify and Protect Salmon Strongholds Will “Complete the Picture” of Salmon Conservation and Management

Current Federal salmon policy recognizes the need for international cooperation on this highly transboundary species through the U.S.- Canada Pacific Salmon Treaty (creating the Pacific Salmon Commission to implement the treaty and advise on harvest allocation and related management issues) and the North Pacific Anadromous Fish Commission (ban on North Pacific high seas salmon fishing). Federal policy also shapes salmon conservation and management through the Endangered Species Act, funded in large part through the Pacific Coastal Salmon Recovery Fund.

While each of these Federal mandates and authorities fulfills an important piece of national salmon policy, there is a compelling need to also enact a Federal policy to support the identification, protection and restoration of our healthiest remaining wild salmon ecosystems—“salmon strongholds.” As I will explain, protecting our strong populations and the functioning watersheds they support restores to prominence a fundamental tenet of conservation biology—to conserve core centers of species abundance, productivity, and genetic diversity.

A Sharp Focus on Wild Salmon Strongholds

The purpose of the Salmon Stronghold Partnership is to identify and protect a network of the healthiest remaining wild Pacific salmon ecosystems in North America to ensure the long-term survival of salmon and the many species that depend on them. The Stronghold Partnership is a voluntary, incentive-based initiative intended to complement ongoing ecosystem protection and restoration efforts by providing leadership, enhanced coordination, and public and private resources to support strategies that prevent declines in the health of salmon strongholds. The Partnership includes Federal, tribal, state, and local governments and nonprofit organizations who are working collaboratively on salmon conservation activities across Washington, Oregon, Idaho, California, and Alaska.

The Salmon Stronghold Act will provide a high-level forum to improve coordination among key public and private actors, address cross-cutting issues affecting multiple strongholds, and leverage private funds to implement high value conservation actions within strongholds. Our goal is to improve policies affecting strong salmon populations and deliver public and private resources as efficiently as possible directly to local entities implementing protection and restoration actions.

The Salmon Stronghold Act will assist state governments like Washington State to accelerate implementation of a holistic, comprehensive salmon conservation and management approach that integrates all the “H’s” (habitat, harvest, hatchery and hydro).

State and tribal salmon management has been focusing on developing ways to protect wild populations while harvesting hatchery fish. This focus on meeting conservation needs and harvest goals for a variety of stakeholders has led us to understand the importance of all the H’s: habitat, hatcheries, harvest and hydropower—working together to implement ecosystem-based wild salmon goals. Washington’s experience and experimentation in this area is instructive, with its tribal and state co-managed salmon fisheries and presence of both ESA-listed and non-listed wild salmon stocks.

Recently, the Washington Department of Fish and Wildlife adopted an integrated “All-H” management framework to overcome the historic “silo” approach to determining harvest, hatchery and habitat strategies and approaches. Identifying strongholds and coordinating Federal efforts with state, tribal and private ones will fill a hole in salmon protection and restoration for populations critical to maintaining the long term abundance and diversity of wild stocks. Stronghold sites, and the organizational capacity provided by the make-up of public and private actors engaged in the Salmon Stronghold Partnership, provide an ideal venue to pilot salmon policy integration strategies, in addition to accelerating ongoing protection and restoration actions in these systems.

In its recent review of all of Washington’s hatchery programs, the Congressionally-sponsored Hatchery Scientific Review Group (HSRG) concluded that:

- (a) Hatchery and harvest reforms alone will not achieve recovery of listed populations (habitat improvements are also necessary), and
- (b) The effectiveness of habitat actions will be greatly increased if they are combined with hatchery and harvest reforms.

Under the HSRG assumptions, analysis of the “Primary” populations in the Lower Columbia Chinook Evolutionary Significant Unit suggests that the benefits of habitat quality improvements would more than double if combined with hatchery re-

forms. The Salmon Stronghold Act will provide the focus and forum to bring these elements together for strong populations (see www.hatcheryreform.us; Columbia River Hatchery Reform Project; Final Systemwide Report, p. 12).

Salmon Conservation and Management requires system-wide, cross-cutting policy coordination and harmonization. The Salmon Stronghold Partnership provides a unique cooperative forum for public and private stakeholders to improve our salmon management and conservation policies.

The salmon lifecycle crosses freshwater and marine domains, political boundaries, and land ownerships. Salmon challenge our commitment to “eco-system based management” in practical ways, not the least of which is to align the policies and approaches of our Federal land managers and regulatory bodies to ensure compatibility with state and local salmon conservation and management objectives. Existing Federal salmon policies and the important role that Federal land managers and regulators play in salmon strongholds makes the Federal Government a critical partner in this arena.

State managers consider better Federal, state and local policy coordination and implementation at a broad, regional scale a major need and opportunity addressed by the Salmon Stronghold Act. Many challenges and threats exist that transcend watershed boundaries and exacerbate existing problems that limit populations within a particular basin. Unlike basin-specific limiting factors, however, which often require “on-the-ground” solutions implemented at the watershed or reach scale, challenges like climate change can be more effectively addressed through “programmatic remedies” that can reach across multiple strongholds. In many cases, programmatic remedies can be tested and demonstrated in strongholds and then replicated in others.

Because most Federal and state salmon conservation programs focus financial and technical support on specific watershed level restoration strategies, programmatic solutions are often difficult to design and finance under existing programs. This is especially true for new and innovative approaches or policies that are untested, but may be applicable and effective across multiple basins. This Act will enable the Salmon Stronghold Partnership to support programmatic remedies that reach across multiple strongholds by integrating government policies and programs while recommending specific reforms where appropriate. By facilitating improved policy integration, innovation, and targeted reforms, the Stronghold Partnership can remove obstacles to and increase the effectiveness of existing salmon conservation and recovery efforts. The “All-H” integration strategy described above is an excellent example of a broadly supported programmatic remedy that can be championed by the Stronghold Partnership. A few additional examples of necessary programmatic initiatives that have been raised by our partners include:

1. Promote climate change mitigation strategies in salmon strongholds

Leading scientists tell us that intact, functioning ecosystems are critical to mitigating the impacts of climate change on wild salmon populations. Because salmon are an inherently resilient and adaptive species, strong populations provide the diverse genetic reservoirs necessary for the species to adapt to changing watershed conditions across their large region. However, in order to adapt, these populations require complex, intact habitats that maintain their diversity. The Salmon Stronghold Partnership provides an ideal voluntary, incentive-based vehicle to develop and pilot climate change mitigation strategies at a meaningful, multi-state regional scale. As climate change science continues to improve, mitigation strategies are being developed, but few if any of these focus directly on promoting salmon resilience. Because the Stronghold Partnership has explicitly recognized the role of strongholds in buffering the impacts of climate change on salmon, it is uniquely positioned to translate emergent climate change science into management and policy.

2. Integrating working landscapes and salmon conservation

In Washington and elsewhere in the West, public-private partnerships are emerging to devise new approaches to sustaining working landscapes while promoting watershed conservation. The Stronghold Partnership will support a variety of innovative approaches that advance this objective, ranging from those that leverage market forces to incentivize salmon conservation to those that reduce the adverse impacts of historic settlement and development patterns. In Washington’s Wenatchee Basin, for example, land use is driven by a patchwork of local, state, Federal, and private land ownership. This ownership pattern and the inefficiencies it promotes present challenges for both private landowners—who struggle with inefficient fire management, invasive species control, and trespass—and the conservation community, which must contend with spatially inconsistent implementation of conservation

plans. Because salmon use of a wide variety of aquatic habitats throughout a watershed, landscape fragmentation undermine both the watershed's restoration potential and the health of its wild salmon populations.

Neither the agricultural community nor conservation interests in the Wenatchee basin have been able to address fragmentation. Under this Act, the Salmon Stronghold Partnership Board could both elevate this issue as a priority amongst Federal agencies and provide funding to local partners to initiate a project to work with local landowners, local, state and tribal governments to address this important issue. The Board could replicate this approach throughout strongholds. In doing so, the Board would not only address a key limitation to long term stronghold health, but also promote efficiencies across many of the west's working landscapes.

A Winning Strategy for Wild Salmon

The Board and many partners of the Salmon Stronghold Partnership are enthusiastic about increasing our attention on the Nation's healthiest wild salmon populations. We all know that prevention will save money, avoiding costly restoration. We also know that success will require the sustained commitment and leadership from a diverse group of public and private interests, whose equal roles must be acknowledged and empowered by our Federal Government.

The Salmon Stronghold Partnership program relies on science and conservation biology principles to identify healthy stronghold populations and high value conservation needs for these populations. While we use science to identify the stronghold populations, the allocation of project funding requires local buy-in and support. This is designed to ensure a true partnership among local, state, Federal and tribal governments, private landowners, and non-governmental organizations working together to successfully conserve healthy wild Pacific salmon populations.

The Salmon Stronghold Act will demonstrate the Federal Government's recognition of this shared undertaking and the solid scientific foundation upon which it rests.

I urge you to join me, every Pacific salmon state and a diverse and growing number of local, regional and national organizations in supporting the Pacific Salmon Stronghold Conservation Act of 2009 by passing this bipartisan bill. On behalf of the Washington Department of Fish and Wildlife and the Salmon Stronghold Partnership, I would like to thank you for the invitation to submit testimony and participate in today's hearing, and for your time in consideration of these issues.

Senator CANTWELL. Thank you very much.
Mr. Childers, thank you for being here. Welcome.

**STATEMENT OF JOE CHILDERS, PRESIDENT,
UNITED FISHERMEN OF ALASKA**

Mr. CHILDERS. Thank you, Madam Chair, members of the Committee. I am Joe Childers, President of United Fishermen of Alaska. UFA is an umbrella association representing 37 member fishing associations that collectively represent every gear group and every species commercially fished in every region of Alaska.

Commercial salmon fisheries employ approximately 20,000 fishermen and crew who actively harvest five species of salmon. These salmon fisheries produce over \$3 billion in first wholesale value and are the major employer in the broader Alaska seafood industry that all together provides 78,000 jobs and 60 percent of U.S. wild seafood production. There are salmon permit holders from 48 different States and over 2,300 permitted salmon skippers from the States of Washington, Oregon, and California. Thousands more crew and processing workers from throughout the United States depend on the sustainability of Alaska's salmon fisheries. The summer salmon season provides the only opportunity in many communities of coastal Alaska for any sort of cash income. In addition, the sheer volume of activity creates an economy of scale that provides for freight rates that allow for much-needed supplies and fuel to be brought into many of the remote places in Alaska. Indeed, salmon

and other large fisheries in Alaska are largely responsible for keeping the cost of foodstuffs, consumer goods, and energy affordable throughout Alaska.

Alaska produces over 44 percent of the total world production of wild salmon. There are thousands of pristine watersheds in Alaska that together produce this incredible volume of salmon with such tremendous biodiversity. Salmon returns support most of Alaska's wildlife. When bears, otters, wolves, and other animals bring fish ashore, the parts they leave behind are a primary source of nutrients for Alaska's forests. Without salmon, a major part of Alaska would have little value to Alaskans or to the rest of the Nation.

Our pristine watersheds are the key to our long history of sustainability in our fisheries, but things may be on the brink of changing quickly. Right now, we are seeing a rapid expansion in our population in Alaska, coupled with a greatly expanded demand on resources. Alaska's river systems are used increasingly by personal use, subsistence, guided and unguided recreational fishermen.

Requests for expanded fishing access in riparian and upland areas along previously remote watersheds is very worrisome to members of UFA. We hold that the long-term ability for our river systems and watersheds to sustain healthy returns of salmon relies in part on their ability to be protected from people's insatiable desire to access waterfront areas and harvest fish and use the waters for recreational, industrial, and municipal purposes.

Climate change may have significant and potentially irreversible negative impacts. These impacts are not caused by fishermen or by the fishing industry and no amount of mitigation by the Alaska fishing industry can reverse the potential impacts of climate change.

We are experiencing an increase in mining interest in Alaska. Mines are commonly located in salmon stronghold watersheds. The impact of developing mining infrastructure causes great concern by itself, but potentially more worrisome is the likelihood that mine development will provide expanded opportunity for our growing population to access more of the currently pristine waterways in Alaska. One such project is located at the very top of the watershed for one of the largest salmon watersheds in the world. Mine development may proceed because of the lure of hundreds and thousands of construction jobs and the associated increase in taxes, but the risk of expanding access for many thousands of people to the headwaters of Bristol Bay forever is truly frightening. The Bristol Bay watershed has sustained an active commercial fishery for over 100 years, and in 2009 it was at all-time high levels of abundance.

We must learn from other areas. It will be far more economical to protect salmon strongholds before we wreck them than it will be to try to fix and recover them.

We support the concept of Senate Bill 817 of identifying salmon strongholds and the threats to them. We support creating a structure with funding to ensure that we are doing everything we can to sustain and restore salmon where necessary.

UFA maintains firmly that the makeup of the Salmon Stronghold Partnership Board must include not less than four representa-

tives of commercial fishing organizations, at least one from each of the Pacific states.

UFA recommends that funding for potential future programs be appropriated in addition to and not at the expense of other ongoing management efforts.

We applaud you, Madam Chair, for uniting the eight West Coast Senators in co-sponsorship of Senate Bill 817.

We regret that only Alaska can be recognized as a regional stronghold in this legislation. We hope this bill will ensure that the regional stronghold status will not change in Alaska, and we also hope that remaining strongholds in Washington, Oregon, California, and Idaho can be conserved. We hope that this bill will help ensure that we learn from the past, and together we share in the bounty of Pacific salmon.

Thank you.

[The prepared statement of Mr. Childers follows:]

PREPARED STATEMENT OF JOE CHILDERS, PRESIDENT, UNITED FISHERMEN OF ALASKA

Good morning Madam Chair and members of the Committee.

I am Joe Childers, President of the United Fishermen of Alaska (UFA). UFA is an umbrella association representing 37 member fishing organizations that collectively represent every gear group and every species commercially fished in every region of Alaska.

Commercial salmon fisheries employ approximately 20,000 fishermen and crew who actively harvest five species of salmon, Chinook, Sockeye, Coho, Chum, and Pink. These salmon fisheries produce over \$3 billion in first wholesale value and are the major employer in the broader Alaska seafood industry that altogether provides 78,000 jobs and 60 percent of U.S. wild seafood production. There are salmon permit holders from 48 different states, and over 2300 permitted salmon skippers from the states of Washington, Oregon, and California. Thousands more crew and processor workers from throughout the U.S. states depend on the sustainability of Alaska's salmon fisheries. And the summer salmon season provides the only opportunity in many communities of coastal Alaska for any sort of cash income. In addition the sheer volume of activity creates an economy of scale that provides for freight rates that allow for much needed supplies and fuel to be brought into many of the remote places in Alaska. Indeed salmon and the other large fisheries in Alaska are largely responsible for keeping the cost of foodstuffs, consumer goods, and energy, affordable throughout Alaska.

Alaska produces over 44 percent of the total world production of wild salmon. There are thousands of pristine watersheds in Alaska that together produce this incredible volume of salmon with such tremendous biodiversity. Salmon returns support most of Alaska's wildlife. When bears, otters, wolves, and other animals bring fish ashore, the parts they leave behind are a primary source of nutrients for Alaska's forests. Without salmon, a major part of Alaska would have little value to Alaskan's or to the rest of the Nation.

Our pristine watersheds are the key to our long history of sustainability in our fisheries, but things may be on the brink of changing quickly. Right now we are seeing a rapid expansion in our population in Alaska coupled with a greatly expanded demand on resources. Alaska's river systems are used increasing by personal use, subsistence, and guided and unguided recreational fishermen.

Requests for expanded fishing access in riparian and upland areas along previously remote watersheds is very worrisome to members of UFA. We hold that the long term ability for our river systems and watersheds to sustain healthy returns of salmon relies in part on their ability to be protected from peoples' insatiable desire to access waterfront areas and harvest fish and use the waters for recreational, industrial, and municipal purposes.

Climate change may have significant and potentially irreversible negative impacts. These impacts are not caused by fishermen or by the fishing industry and, no amount of mitigation by the Alaska fishing industry can reverse the potential impacts of climate change on salmon.

We are experiencing an increase in mining interest in Alaska. Mines are commonly located in salmon stronghold watersheds. The impact of developing mining infrastructure causes great concern for us by itself, but potentially more worrisome

is the likelihood that mine development will provide expanded opportunity for our growing population to access more of the currently pristine waterways in Alaska. One such project is located at the very headwaters of the single largest sustainable salmon watershed in the world. Mine development may proceed because of the lure of hundreds or thousands of mostly short term construction jobs, and the associated increase in taxes to local governments, but the risk of expanding access for many thousands of people to the headwaters of Bristol Bay forever, is truly frightening to many. The Bristol Bay watershed for example, has sustained an active commercial salmon fishery economy for over 100 years. The salmon returns there in 2009 were at all-time high levels of abundance.

We must learn from other areas—it will be far more economical to protect salmon strongholds before we wreck them, than it will be to try to fix and recover them.

We support the concept within S. 817 of identifying salmon strongholds and the threats to them, and we support creating a structure with funding to ensure that we are doing everything we can to sustain or restore salmon where necessary, for the benefit of future generations.

UFA maintains firmly, that the makeup of the Salmon Stronghold Partnership Board must include not less than four representatives of commercial fishing organizations—at least one from each of the Pacific states.

UFA also recommends that funding for potential future programs be appropriated in addition to, and, not at the expense of, other ongoing management efforts for sustainable fisheries.

We applaud you madam Chairman for uniting the eight west coast senators in co-sponsorship of S. 817.

We regret that only Alaska can be recognized as a regional salmon stronghold in this legislation. We hope this bill will help to ensure that the regional stronghold status will not change in Alaska, and we also hope that remaining salmon strongholds in Washington, Oregon, California, and Idaho, can be conserved. We hope that this bill will help ensure that we learn from the past, and that together we share in the bounty of Pacific salmon.

Thank you for this opportunity to testify, and I am available to answer any questions.

ATTACHMENT

United Fishermen of Alaska Member Organizations

Alaska Crab Coalition
 Alaska Independent Fishermen's Marketing Association
 Alaska Independent Tendermen's Association
 Alaska Longline Fishermen's Association
 Alaska Scallop Association
 Alaska Trollers Association
 Alaska Whitefish Trawlers Association
 Aleutian Pribilof Islands Community Development Association
 Armstrong Keta
 At-sea Processors Association
 Bristol Bay Reserve
 Bristol Bay Regional Seafood Development Association
 Cape Barnabas Inc.
 Concerned Area "M" Fishermen
 Cook Inlet Aquaculture Association
 Cordova District Fishermen United
 Crab Group of Independent Harvesters
 Douglas Island Pink and Chum
 Fishing Vessel Owners Association
 Groundfish Forum
 Kenai Peninsula Fishermen's Association
 Kodiak Regional Aquaculture Association
 North Pacific Fisheries Association
 Northern Southeast Regional Aquaculture Association
 Petersburg Vessel Owners Association
 Prince William Sound Aquaculture Corporation
 Purse Seine Vessel Owner Association
 Seafood Producers Cooperative
 Sitka Herring Association
 Southeast Alaska Fisherman's Alliance

Southeast Alaska Regional Dive Fisheries Association
 Southeast Alaska Seiners
 Southern Southeast Regional Aquaculture Association
 United Catcher Boats
 United Cook Inlet Drift Association
 United Southeast Alaska Gillnetters
 Valdez Fisheries Development Association

Senator CANTWELL. Well, thank you all for your testimony and again for being here today and for your work in a comprehensive way to try to help tackle this important issue for us.

I am going to start with you, Mr. Rahr, about this issue that you all kind of touched on about the endangered population and then the healthy population. Do you think that it is a fundamental flaw in our efforts to protect and restore wild salmon if we only focus on the endangered side of the equation?

Mr. RAHR. I do not think that the Endangered Species Act alone is going to succeed in giving our kids the chance to have healthy wild salmon runs. I mean, it kicks in when the populations have already reached such low levels that many of the factors causing their decline are entrenched. So in addition to the ESA, we have to have a proactive strategy. History has shown—I mean, it is clear now that the cost of recovery is high. And so the cost of preventing those things that are driving the salmon down would be lower than the cost of having to recover them later.

So, the ESA is important and necessary, but this is an important addition to that. It is almost like a stock portfolio where most of our stocks now are the high-risk and rather expensive and we need to balance that with a more strategic allocation of our resources. So an additional investment in protecting strongholds makes economic sense, and as Gordy mentioned, it is also a foundation of—it is supported firmly in science that you protect the best while you still can.

I think that also it is worth adding that no matter what else we do, if we get this piece wrong, if we do not protect the strongholds, we will not succeed in having healthy wild salmon runs in 30 or 40 years. We have to get it right, and it is our best chance. So I think it is an important addition.

Senator CANTWELL. How is the stronghold addressing some of the specific root causes of the decline, as opposed to treating the symptoms?

Mr. RAHR. Well, what it does is it basically protects—gives you a chance to work with communities to protect forests and in-stream flow and wild populations. It enables you to identify and it gives us the chance to create those kind of partnerships to look into the future and see what is coming around the corner next and anticipate that, and, as Sara mentioned, while there still are people in the watershed that care a lot about it.

So, for example, instead of having to replace the fish with a fish hatchery, if we succeed with the Stronghold Act, we will have free wild salmon coming back with a healthy wild salmon run. So it enables you to get ahead of the extinction curve.

I am not sure if I am answering your question.

Senator CANTWELL. Well, Ms. LaBorde talked about not being able to address this watershed by watershed, that you needed a more comprehensive approach. Maybe she could elaborate on that.

Ms. LABORDE. There are a number of issues that are bigger than watersheds like patchwork landscapes. You work with energy. You know how complex the county taxing systems and rural economies are in terms of what they depend on. So imagine these watersheds that have patchwork ownerships, large Federal owners, large state owners, large private owners, all with different mandates, all with different missions, with small, little local communities that depend on them and having those landscapes work. They are not always put together right for fire, for invasive species, for protecting critical natural resource areas. And the John Day, Wenatchee are all trying to grapple with this, but there is no elegant system that lets us look at that landscape and say how do we protect these areas, how do we deal with this ownership and still have a strong local economy, a tax base, a development piece, have critical areas protected.

One of the priorities of the Stronghold Partnership is to look at that and come up with solutions that can elegantly work on all of those landscape properties and kind of rematch them in the right place. The State of Washington just did this with Washington DNR and Washington Fish and Wildlife, a 3-year process just to lay out what is forest lands, what is fish and wildlife lands, and how to work them correctly so that the landscape works better for both missions. That is one of the pieces that can go on here.

Another big programmatic is climate change. How do we step back, bring the best science to the ground level? One little watershed cannot do that, and frankly, one state cannot.

But this organization, when you put it together, has the right people at the table, every state agency, the Governors' offices, every state fish and wildlife agency, all the big Federal agencies, Forest Service, NOAA, U.S. Fish and Wildlife Service, USGS. They are all at the same table working on solutions to focus all of their priorities, and that is what we need to do if we are going to really tackle this idea of getting stronghold populations protected.

Senator CANTWELL. So you are saying coordination by interested parties on prevention.

Ms. LABORDE. Yes.

Senator CANTWELL. Senator Begich?

**STATEMENT OF HON. MARK BEGICH,
U.S. SENATOR FROM ALASKA**

Senator BEGICH. Thank you very much, Madam Chair.

Joe, if I can ask you a couple questions. Thank you very much for being here. Let me ask some Alaska-specific ones first.

As we focus on preserving and prevention—actually I was very intrigued by the conversation that was just going on here. So I appreciated the idea of how we have responded to mostly a crisis moment rather than thinking long-term.

But in Alaska, it is kind of an interesting situation. As we work to conserve our key production areas, what is the impact, do you think, to non-areas or areas we are not going to be highly focused on with this Act? Give me a feel. Will we create an imbalance or will we kind of be focused on one area and then forget about what is going on over here, Joe?

Mr. CHILDERS. Thank you, Madam Chair and Senator Begich.

I am not certain I follow the question exactly, Senator, but I believe the question is since Alaska is all—basically all of our systems are salmon strongholds today—there are a few that we should probably be concerned about.

Senator BEGICH. That is where I am trying to get to.

Mr. CHILDERS. I think that this legislation will provide the framework and the process for doing just that, I mean, to look at systems that are potentially at risk. I think that is what the value is.

Senator BEGICH. I think you have answered it. Even though they are considered a stronghold, it is not necessarily that all are equal. Is that a fair statement?

Mr. CHILDERS. Madam Chair, Senator Begich, yes, that is exactly what it is. Not all systems are the same. Not all systems have the same degree of access or request for access.

Senator BEGICH. In understanding that we have, again, a lot of strongholds and that our fishery is fairly strong in the sense of the quality and in the sense of the long-term ability for it to continue to move forward, how will this Act in your mind for Alaska's fisheries that I like to brag about—you had some good points in your commentary about the sustainability of it, as today, even though it is not salmon, we have read some more stuff about what is happening in Maine in some of their fisheries or their capacity. But in ours, which are very sustainable, how will this Act actually help us in the sense of moving forward? I think I know the answer to this, but I want to hear it from you. I mean, prevention is really the long term here.

Mr. CHILDERS. Well, Madam Chair, Senator Begich, Alaska depends to a great extent on its commercial fisheries. They have been ongoing for over 100 years, and they permeate the economy at levels that most people do not even recognize.

The sustainability of the fisheries is what provides the predictability of the future for industry and for communities to build infrastructure and to make investments. And the predictability with the sustainability is what has allowed fishermen to buy into the very conservative management programs that we have in place and have had in place for Alaska for over 50 years.

Senator BEGICH. If I can, Madam Chair, just ask a couple more quick ones. Do you think as this Act moves forward, from Alaska's perspective and then in conjunction with the Northwest region, as you focus on the strongholds—and I actually like to use the word “prevention” because this is really what we are trying to do, is not get in the situation—you know, I turned on NPR today and I listened about the sardine industry, or no-longer sardine industry in Maine closed its last plant today as an example—is the idea that as we work on kind of the crisis management, which will always be there in certain elements and certain species, that the long-term investment that we are going to make here and the cooperation, which I appreciated that conversation about all the different agencies and state layers and so forth working together, that the real goal here is to make sure that we have a balanced approach in our whole management of fisheries from a Federal level and not just on the “wait until it turns into a crisis.” Then throw tons of money

at it and hope and pray it all works out. I am trying to summarize it in my own simplistic way to look at this.

Mr. CHILDERS. Madam Chair, Senator Begich, exactly. That is what it is. We have a great thing, and it is easy to overlook it sometimes I believe. The costs of letting it go away are incredible to Alaska.

Senator BEGICH. And the last question and I will just leave it at this. Anyone who wants to comment on this, how you see this Act helping from an international perspective? As we develop and work on our strongholds here, how do we see the connection to the international fisheries? Because it is not just—I mean, obviously, we will be parochial for a moment here. Our fisheries are the most important. Of course, I would say Alaska's fisheries are the most important. But American fisheries are the most important. But how does it work from an international perspective? Whoever wants to respond to it.

Mr. RAHR. I think I can speak to that. I think it is in our interest that the other nations of the north Pacific do not make some of the same mistakes we have made, not so much in Alaska, but other areas. I think we have an opportunity to help them learn from our successes and failures. We do not want history to keep repeating itself like it has along the Atlantic and much of the Pacific, especially in the Russian far east, for example, and even in Hokkaido and British Columbia to an extent also.

So we have been engaging our partners in those nations to help them to create a kind of community of exchanging information, lessons learned. There are things we can learn from them. And it is in our interests, if not just for a food security issue, that they get it right. 40 percent or so of the salmon production comes from the Russian far east. You have got growing economies in Asia that are dependent on that protein and possibly us too. So I think we need to work with our neighbors and foster a sense of community. We share this great kind of arc, and I think they are exploring related strategies like the one we are talking about today.

Senator CANTWELL. Just to follow up on that question, Mr. Rahr, how in fact are at the center coordinating those efforts on an international basis, and what do you think their monetary contributions to this will be in the future?

Mr. RAHR. Well, it is really early to be able to say. But we have been working with Russian scientists on helping them prioritize watersheds and set conservation goals and also learning some things from our Russian colleagues too. It has been a very fruitful exchange. One thing we have done—the concept of watershed councils that we developed in Oregon to help aid recovery, which could be an important part of the stronghold work—they are now exploring that on Sacland Island where they have a tremendous problem with poaching in the Russian far east. And so the communities are coming together to chase away the poachers.

Now British Columbia is looking at adopting something similar to the Stronghold Act, recognizing that some systems are so important that they need to be elevated.

Does that get to your question, Senator Cantwell? Were you looking from a strategic standpoint or more of a monetary standpoint?

Senator CANTWELL. A leveraged standpoint.

Mr. RAHR. Yes, how we can leverage the conservation efforts in those nations.

Senator CANTWELL. Yes.

Mr. RAHR. It has been very fruitful. By us doing this, it sends a clear example to those other nations that it is an opportunity for them too. I mean, they are watching us, and they see that some of the issues we have had to face over the last 50 years may be next for them. And so it is important that they can learn from that. This provides a useful model for them.

Senator CANTWELL. Do you have a question?

Senator BEGICH. Just a quick thing on that just to follow up. Do you see them waiting for us to take an aggressive role before they—I think both getting at this is such a good method of thinking about the future rather than the crisis. Are they waiting for us to make the move to see how it works or does not before they make an aggressive move? I think that is where you were getting.

Mr. RAHR. I cannot say that it is that explicit, but they are very interested in the approach and they are becoming increasingly aware of the danger of relying only on the endangered species approach. This is really relevant to Canada and the Russian far east. I have not heard any statements that they are waiting for us to move and then they will move. It is more, I would say—I mean, it is really a partnership.

Senator CANTWELL. Well, part of this is about leverage, and one of the things that the Pacific Coastal Salmon Recovery Fund has done is leveraged additional state dollars and local dollars. So do you think that this is the same way the stronghold would work in leveraging community and state support as far as dollars?

Mr. RAHR. Oh, in the international context?

Senator CANTWELL. Well, now just talking locally for a second within the region.

Ms. LABORDE. Actually I think it will even be more successful than PCSRF in leveraging dollars. What we have heard of—and Guido, you are probably a better expert on this—is the larger private funding sources are very interested in a stronghold approach. Bringing back listed species that are already down to 50, 75, 100 fish, a long-term investment. Will it ever happen? A huge lift. And ESA is working on that. They are much more interested in looking at how do you move forward on the stronghold piece and have really been supportive of being able to match public funds that come in inside watersheds to help them move forward with very concrete, specific goals and objectives that are very measurable. I think it is going to really leverage those funds.

Senator CANTWELL. How would we measure that? I mean, if you are saying there is a multiplier effect that is better than what they got, in these tough economic times, how would you show that support in advance? A demonstration of the interest in that level of support, I should say.

Ms. LABORDE. The Moore Foundation is probably the premier private funder just on the issue of moving salmon and climate forward, right now, working with the Salmon Stronghold Partnership and the Wild Salmon Center to say, OK, can you get some Federal funds to help us now take this science to the managers and help apply it. We know enough that we can bring it into the decision

process in some arenas. To me, that is the most exciting piece of a huge private funder stepping out in front of the issue, getting the best scientists in the Northwest together to look at this issue. Their findings will come out in April–May. Trout Unlimited is going to have some of their presentations at their May meeting. Just exciting work that will move all of us forward in how do we deal with salmon with climate change moving on. But it was that private money that leveraged all of that research forward.

Mr. RAHR. Madam Chair, if I could add to that. The potential to lever private support, as Sara mentioned, is huge. This can create the framework that we can unlock that. What salmon systems have is people that really care about them, but it is important to create the conditions that we can use to unlock that.

But one great example is on the Olympic Peninsula with the Ho River. It was in the Seattle Times day before yesterday that the Wild Salmon Center, other conservation groups worked with the Federal Government, state government, and timber companies to create a conservation corridor along the Ho River, which is one of the most important strongholds south of Canada. It is a relatively modest investment. The Ho, the habitat, is protected. The Ho Tribe has a source of wild salmon. The sport fishing community is vibrant. I mean, it really did work there. So there is an opportunity, a big opportunity, for leveraging.

Senator CANTWELL. But they, obviously, are seeking coordination for their interests. I mean, they want their dollars to be spent wisely, and that is why we are here with this legislation. Is that correct?

Mr. RAHR. Well, yes.

Senator CANTWELL. Without a coordinated effort—which I wanted to go back to Dr. Reeves. You made this comment about intact networks, that you have to have these networks to have scale, that we have to be proactive about that because in response to change, we are losing some of that. Could you elaborate on that?

Dr. REEVES. Yes. One of the things we need to recognize is that a salmon from one place is not the same salmon as from another place. These populations are really uniquely adapted to local conditions. Sometimes they can be large areas. Sometimes they can be small areas.

And what allows them to be so well adapted to the local environment is their genetic and phenotypic diversity. What they need to be able to do is express that, have an environment in which those traits can be expressed. So what we need are these complex environmental places where you have a range of potential life history types or phenotypic types of fish to allow them to persist on the landscape because that is going to be the key response to change. Do we have that diversity out there? Do we have that potential for that to be expressed? And these intact networks—the more intact a watershed is, the ecosystem is, the more likely you are going to have that basis for these populations to respond to challenges in the future.

Senator CANTWELL. What are some of those things? I feel like I am going back to Ms. LaBorde when she talks about watersheds. But are some examples of those intact networks or—sorry—conditions that would create an intact network?

Dr. REEVES. Well, one would be just a variety of habitat. You have got flood plain habitats. You have got off-channel habitats. You have got diversity of habitats where different types of fish can persist. One would be that you have got a range of environmental gradients, say, from areas that are dominated by snow to areas that are dominated by rain. Within each of those, you are going to have really unique adaptation of these populations or within populations, and having that diversity of conditions on the ground—one of the things we tend to do is see systems become much more homogeneous rather than heterogeneous through activities. We tend to simplify them, and that simplification process then constricts or restricts the ability of these fish to express the different life history variation. And that inherent variation and the capability to express it is what is absolutely key to getting these fish through the challenges that they face in the future.

Senator CANTWELL. So what would be the example of difference in those networks, just for interest of the Committee between, say, Senator Begich's State and the State of Washington in some of those issues?

Dr. REEVES. OK. Let me think about it.

One is simply like with sockeye salmon, for example. You are going to see sockeye salmon in Alaska that may require the use of lakes to complete their freshwater life history cycle. At the same time, within that population, you may have sockeye salmon that are not requiring a lake and they can simply move straight—you know, what are called "zero check fish." They can almost be moved down to the marine environment immediately or they can use river systems. So, you have that type of variation within the population.

In the Northwest, a great example would be—the best example I can cite is on the Sixes River on the central coast of Oregon. And in that, what we have seen is there are five or six different life history types, everywhere from fish that leave immediately—these are fall Chinook and they can emerge from the gravel and they move immediately to the marine environment to fish that spend a whole year in fresh water and all within one population.

And depending on the ocean conditions, one particular type, one of those sub-life history types, will be more successful than the other. So that variability allows the persistence of these populations. Again, that variability is premised upon the environment allowing those expressions to happen. And these intact watersheds are really key to maintaining that ability to express that variability.

Senator CANTWELL. And carrying that down the coast, what would California's issues be?

Dr. REEVES. Oh, you know, some of the steelhead, for example. In steelhead, you have a range of life history expression, and you could have a resident rainbow trout giving rise to steelhead, and steelhead are the seagoing anadromous version of rainbow trout. But you can have resident populations. So by protecting that whole network, for example, and protecting the resident populations, you may actually have a source to jump-start the recovery of listed fish. Oftentimes what we are doing is we are just looking at the steelhead and we are saying, well, the other parts of the watershed may not be important, but the key to recovery of those steelhead

may be those resident fish that we are not looking at. So, if you look at the whole watershed and the variability within it, that could be absolutely key and paramount to these recovery processes.

Senator CANTWELL. Thank you.

Senator Begich, did you have further questions?

Senator BEGICH. Maybe one or two, just very general for all four of you, if I could. Let us assume the perfect world, which the Chairwoman and I would love to live in, and that is, this bill passes right now. That would be the perfect world, that we can control that outcome and it happens. What would be the challenges that you would see based on this legislation for implementation on the ground? Because one thing we are very good at here, we try to work through all those elements, but it is hard once something hits the ground to understand what might happen from the people who practically have to deal with it.

So maybe I will start with you, Dr. Reeves, and move down to Mr. Childers, if that is OK. Based on what we have here, what are going to be the challenges that we might have some impact on or we may not, but it is something we have got to think about as we move this forward?

Dr. REEVES. Well, I think from a science perspective, the main challenges would be getting people to understand what new science needs to be brought to bear. Having people consider entire watersheds and the ecological processes within them is potentially a major hurdle. Right now—

Senator BEGICH. If I could interrupt. The discussion we just had here, for example, of the different watersheds and the impacts on them.

Dr. REEVES. Yes. So we are going to have to have a major shift. In much of the conservation community right now, our restoration efforts are focused on relatively small segments of stream, and they are dealing with basically improving that small segment. I think what this legislation and the ideas behind it point to is you need to think about the ecosystem and the ecological processes in maintaining and restoring those because that is going to be the key, I would argue, to the protection and recovery of these fish.

Senator BEGICH. Thank you.

We will kind of move down the line here. And if you do not have a comment, that is OK too.

Mr. RAHR. Well, I will add one. I think it is important that we are able to develop and implement efforts that we can measure impact of over long periods of time that are really going to stick and not allocate our resources to things that are ephemeral and really get at some of the things that are necessary that we have to do to protect these systems. So that is going to be a challenge and it is going to take the cooperation of our partners at the local level to think big and think long-term and think of stuff that is really going to stick, not stuff that we would like to do, but stuff that we have got to do. That is more of a conceptual response.

Senator BEGICH. If I can just ask a question before I move down the line here. Do you think the partners have the capacity to do that? Let me put it another way. Could they have capacity to do it?

Mr. RAHR. Yes. The beauty of the stronghold strategy is these places are still functioning and so it has not really happened yet, otherwise they would not qualify. So you have a chance to get the community to say what do you want this place to look like in 40 years, which is a completely different way of thinking about what you want it to look like tomorrow. Once it drifts down the road toward decline, then you kind of get a shifting baseline thing and people have a different reality. So I mean, that is both a challenge and an opportunity to think long-term.

Senator BEGICH. Very good. Thank you.

Ms. LABORDE. I think the biggest challenge would be you holding us back because we are ready to go. With 11–12 years of salmon recovery, we know how to make things work at the watersheds. We know what it means to have a locally-based decision and process, and they are cranked up and ready to focus.

Environmental capacity they have. Funding capacity—the State agencies, every one of them—you know their economic situation. So there will be a staff capacity. It will be hard to have staff to engage to be able to push the process and provide the technical assistance at the local level. But we have priorities identified. We have worked with local groups. We are excited to move this forward.

Senator BEGICH. Very good.

Mr. Childers?

Mr. CHILDERS. Thank you. In Alaska, it is quite a bit different. Basically in Alaska, we have inholdings of society surrounded by salmon strongholds. So it is quite a bit different. The issue that we are faced with really is the fact that since Alaska became a state and—well, since statehood, for certain, the fish have always come first, and now we are at a point where we may be looking at allocation issues for just allocation. Without being well enough educated—and I think that the population of Alaska needs to have this kind of an approach to be brought forward so that people begin to recognize just what sort of beauty there is in these salmon strongholds and what we would lose if we do not have them and also recognize that by not doing this, it is very clear what will happen ultimately. We will look just like everywhere else in the world. And we can do it probably faster now than we have ever been able to do it before. That is really frightening.

Senator BEGICH. Very good.

Senator CANTWELL. Go ahead.

Ms. LABORDE. Well, Senator, I think it comes down to the fact that this Act is founded on a couple key principles. One, salmon is a great critter. It adapts and it comes back. And if we can work in healthy systems that have the functioning pieces that salmon need and we also then—so we believe in the fish. We believe in the people, and we believe in the fishermen to make this all work. And that is what we believe that will make this successful.

Senator BEGICH. Very good. Thank you very much.

Senator CANTWELL. That is almost a great ending note, but I have a few more questions.

[Laughter.]

Senator CANTWELL. This is so important because we are going to get into this discussion about the Recovery Fund from our col-

leagues and the amount of money and all of this. And I want to make sure that we are well prepared to answer this.

So, Mr. Childers, if we do not give more attention to the salmon—with Alaska being one-third of the population, if we do not give more attention to strongholds, will that not be a threat then to the Alaska population? I mean, will we not really be—I mean, is it not almost just too important to be taken for granted?

Mr. CHILDERS. Madam Chair, in my opinion it is. It is way too important to be taken for granted. I think that if there is not a very concerted effort to educate the residents of Alaska certainly and really the rest of the Nation to what will happen if we do not do this, if we do not identify these strongholds and identify the long-term needs for sustainability and the economic value that they actually bring forever—I mean, the net present value of a billion dollar salmon industry—it dwarfs short-term investments into things—I mean, these fish could be here forever and have been. The education needs to begin or we are going to begin rapidly repeating all of the problems that have led to the problems on the West Coast and the East Coast and in Europe.

Senator CANTWELL. Thank you.

Then, Dr. Reeves, how will the strongholds be identified? How would you from a scientific perspective and definition and prioritization?

Dr. REEVES. There are a number of tools that are available right now. One is called Marxan which has been used worldwide for the identification of areas for conservation, and it is basically an optimization program that looks at all the possible combinations that you can have to achieve your goal and it tries to do it in the most efficient way. And that is what we have been using in the initial identification process of strongholds. And it has to meet the criteria I listed in my testimony of irreplaceability and so on. What you can actually do is go through and you set your goals and objectives and come up with a prioritized list of these strongholds. You know, that is the scientific basis, and then there are the social-political issues about how do we mix and match those to meet the objectives. There is a really strong foundation for doing this that we can use right now and are using right now in this process.

Senator CANTWELL. Is that not almost even a better leverage of science than is already used with the endangered stock? Because we are using that science in advance. You actually can leverage it for protection purposes.

Dr. REEVES. Yes, that is absolutely right. Right now everything is being considered without looking at—not that they are not all important, but some places are going to be absolutely crucial, particularly in the short term. And this tool is one way of helping identify that.

Senator CANTWELL. So leveraging that science, Ms. LaBorde, do you think that we will actually see a decrease in funding costs in the future on recovery if we do stronghold right? I do not mean immediately because I know that there is an issue here of people being anxious about the short term, but in the long run.

Ms. LABORDE. There is study after study that shows it costs more to restore a habitat or a function than it does to protect it and keep it intact. And then include all of the unbelievable eco-

conomic benefits that clean water, water recharge areas, all of those other pieces you need for local communities that benefit from a healthy system.

Senator CANTWELL. So I guess I do not want to draw conclusions, but I would say from what Mr. Childers just said, that if you do not address this, then you could see the Pacific Coastal Salmon Recovery Fund being greatly increased in the future, people asking for additional funds to, again, deal with the problem behind the curve as opposed to in advance.

Ms. LABORDE. That is right. If you want to meet the goal of recovering Pacific Northwest salmon, yes.

Senator CANTWELL. So this definitely meets the definition of an ounce of a prevention.

Ms. LABORDE. Thank you, yes.

Senator CANTWELL. All right. Well, unless my colleague has any more questions, thank you all very much for being here. Thank you for your dedication to this important issue, and I look forward to working with my colleagues all up and down the coast on this important legislation and moving it as quickly as possible.

The hearing is adjourned. Thank you.

[Whereupon, at 11:04 a.m., the hearing was adjourned.]

A P P E N D I X

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. MARIA CANTWELL TO
DR. GORDON H. REEVES

Question 1. Why is this sort of stronghold management so important to “complete” the picture of Pacific salmon conservation?

Answer. The foundation of the salmon network approach is well embedded in principles of conservation biology and has the potential to help prevent further declines of native salmon and trout and the ecosystems in which they reside. Protecting populations and their ecosystems is a primary principle of conservation biology. Conservation is most successful when actions are directed at protecting populations before they decline, and protecting ecosystems before they are degraded (McGurrin and Forsgren 1997), which is the foundation of a stronghold strategy. Populations that are in decline are much more difficult to conserve and to recover than are productive, intact ones. Focusing efforts on intact populations where they exist is a prudent component for the long-term conservation of native salmon and trout (Gustafson *et al.* 2007).

Current species recovery efforts emphasize recovering weaker, and often declining, populations. However, recovery of declining populations and degraded or compromised ecosystems is difficult and costly, and results are generally limited. Increasing the focus on and recognizing the importance of intact habitats and associated populations helps to make recovery efforts more robust and increases the likelihood that listed organisms could recover.

There are many benefits to including a stronghold network as one tool of a recovery effort. Strongholds have the potential to increase the overall effectiveness of a network system. Pinsky *et al.* (2009) found that less than one percent of the watersheds with a high diversity of Pacific salmon around the Pacific Rim were within any protected area. In the longer term, such a network would have a greater potential to: (1) contribute to the persistence of strong populations; (2) contribute to the recovery of depressed populations by providing an infusion of numbers and genetic and phenotypic diversity; and (3) provide a suite of ecological services to local communities.

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Question 2. What benefit will the salmon stronghold approach have for salmon populations with regard to climate change?

Answer. Pacific salmon in the Pacific Northwest and Alaska are especially vulnerable to potential impacts of climate change because of their dependence on both freshwater and marine ecosystems. Potential impacts in the marine environment include: (1) changes in the thermal regime (Mantua and Francis 2004) and timing and intensity of upwelling (Hsieh and Boer 2007); and (2) increased acidification (Orr *et al.* 2005). Predicted impacts on freshwater ecosystems include: (1) alteration of flow and temperature patterns; and (2) increased frequency of disturbances such as wildfire and drought (Hamlet and Lettenmaier 2007). The primary cause of decreasing summer flow is increasing air temperatures, which are reducing snowpacks and melting existing snow accumulations earlier in the spring (Regonda *et al.* 2005; Stewart *et al.* 2005). As a result, stream runoff may shift 2 to 4 weeks earlier in the season (Regonda *et al.* 2005; Stewart *et al.* 2005) and subsurface aquifers may provide less groundwater for stream flow in the late summer and early fall (Hamlet

et al. 2005). There will likely be wide variation in the expression of potential impacts of climate change within and among watersheds in any given area. The potential effects of climate change are relatively minor compared to the environmental variation faced by native fish over time (Waples *et al.* 2009). However, change is now occurring more rapidly than many of the past changes that these fish have experienced (IPCC 2007) and is following a period of extensive and fairly rapid ecosystem alteration.

The potential impacts of climate change pose a major threat to native salmon and trout, particularly weak populations, in the Pacific Northwest and Alaska. Likely consequences include changes in the: (1) behavior and growth of individuals (Neuheimer and Taggart 2007); (2) phenology (*i.e.*, timing of life-history events), growth, dynamics, and distribution of populations (Hari *et al.* 2006; Rieman *et al.* 2007); (3) persistence of species and fish communities (Hilborn *et al.* 2003); and (4) functioning of whole ecosystems (Moore *et al.* 2009).

The vulnerability of salmon and trout species and population units to climate change will depend on the characteristics of the species or population, and local environmental conditions, as well as past habitat alteration, fragmentation, and loss. Larger, more productive populations have a better likelihood of adapting to climate change, in part, because of the inherent genetic and phenotypic diversity within them (Waples *et al.* 2009). However, Pacific salmon, particularly in the Pacific Northwest, no longer have the historical intact networks and diversity of habitats and have reduced genetic, life-history, and evolutionary potential that may reduce their ability to respond to the impacts of climate change. Conserving and creating networks of watersheds across large spatial scales is a key component of providing opportunities for native salmon and trout to adapt to climate change. Large networks, like that would be created from the proposed legislation, are more likely to provide: (1) diverse habitat required over the life span of these fish; (2) the complexity and area to absorb catastrophic disturbances without loss of entire populations; and (3) greater species, genetic and phenotypic diversity (Mantua and Francis 2004, Fausch *et al.* 2009, Greene *et al.* 2009).

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Question 3. How will strongholds be identified?

Answer. The identification and selection of a stronghold network is premised on principles of systematic conservation design, which are well established in the scientific literature (see Soule and Terborgh 1999). These include: (1) comprehensiveness—the extent to which the network protects the desired level of biodiversity and abundance; (2) irreplaceability—the inclusion of areas or populations that are necessary to achieve the conservation goals; and (3) efficiency—the network is designed to achieve the conservation goals while minimizing the area involved.

Advances in Systematic Conservation Planning (Margules and Pressey, 2000) provide a structured, efficient, and scientifically defensible conservation framework for locating priority geographic areas and conservation networks. The primary planning process involves finding the most cost-effective and optimal set of areas to meet the desired conservation goals (Watts *et al.* 2009). Key components within this framework include: (1) compiling data on the biodiversity of the planning region; (2) identifying conservation targets and goals; (3) reviewing existing conservation areas; and (4) selecting additional conservation areas.

Marxan is the most widely used Systematic Conservation Planning tool in the world (Ball and Possingham 2000), and has been applied primarily for the identification of marine and terrestrial reserve networks. Marxan provides optimal solutions to creating conservation area networks based upon explicit conservation targets, goals, and suitability costs. Scientists from the Wild Salmon Center, other NGO's, the Forest Service, and universities have adapted Marxan to aid in the identification of a network of salmon networks in the Pacific Northwest and Alaska. Marxan identifies sets of watersheds that meet the objective of the stronghold network in the most efficient manner and at the least cost. Some particularly high quality watersheds occur in many, if not all, of the potential sets and make the greatest contribution to meeting the established goals for the network. We have designated these as “core” watersheds. Core watersheds may not by themselves be sufficient to meet the desired goals and so often, some combination of additional watersheds is required. We have designated these as “contributing” watersheds. The final configuration of the network will be determined by the Steering Committee. This process will provide stakeholders and other interested parties the ability to establish desired goals for the network (for example, amount of species and life-history diversity to conserve), and then identify and develop a scientifically sound stronghold network that meets the goal at the least cost in terms of area involved and potential economic constraints.

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Question 4. What components will be part of the stronghold definitions so that funds can be prioritized?

Answer. The output from Marxan can provide an avenue for prioritizing the allocation of funds for a salmon stronghold network. One possibility is to prioritize the core watersheds, which make the greatest contribution to the network. Marxan can also be altered to take into account factors which cannot be easily quantified in identifying a network (Ball and Possingham 2000). Such factors could include social and political concerns like unemployment, focus on Federal lands and other factors. These factors could be particularly important if a goal in the establishment of a network also includes the creation of jobs.

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RESPONSE TO WRITTEN QUESTION SUBMITTED BY HON. OLYMPIA J. SNOWE TO DR. GORDON H. REEVES

Question. What precedents exist for this type of management, and have stronghold management approaches resulted in measurable conservation gains for target species?

Answer. A key purpose of conservation biology is “To retain the actors in the evolutionary play and the ecological stage on which it is performed” (quote of G.E. Hutchinson in Meffe and Carroll 1999). The establishment of strongholds, also known as reserves, is a primary tool for meeting this goal and has been employed around the world to help protect a vast number of organisms and resources (Margules and Pressey 2000). Generally, reserves/strongholds are established in areas that have strong populations and intact, functioning ecosystems, because conservation actions are most successful before populations or ecosystems begin to decline. Strongholds have been established primarily to protect habitat and populations of marine and terrestrial species. The stronghold network proposed by the current legislation would be one of the first for freshwater fish.

While many strongholds and stronghold networks have been established, it is difficult to fully assess their success (Gaston *et al.* 2006). The reasons for this include the: (1) paucity of systematic data; and (2) incompatibility of data that has been collected to measure the performance of the individual efforts. However, studies that have evaluated strongholds and stronghold networks found them to be generally successful in meeting their conservation objectives. The North American Flyway, which is a series of reserves on public and private lands along the migratory corridors of waterfowl that were established by the Migratory Bird Treaty Act, has helped to maintain healthy waterfowl populations (Nichols *et al.* 1995). Halpern (2003) reviewed the biological response to the establishment of 89 marine reserves worldwide. The density of fish was 2 times greater, biomass was 3 times greater, and size and diversity were 20–30 percent higher in reserves than in adjacent areas. Rates of declines of biodiversity in English reserves were generally lower than or similar to declines to outside areas (Gaston *et al.* 2006). Several studies have found that the positive effects of reserves increase with the size of the protected area.

Scientists have suggested for several years that stronghold or a similar approach should be part of the conservation strategy for native freshwater fish. Williams *et al.* (1989) and Moyle and Yoshiyama (1994) were among the earliest to argue for this approach. The former noted that no ESA listed freshwater fish had recovered sufficiently to be delisted.

Since that publication, the number of freshwater fish listed under the ESA continues to increase, while few have been delisted (Williams and Miller 2006). As Pacific salmon, and other native fish, in the western United States continue to decline, scientists are finding that protection of areas with the strongest and most diverse populations and most intact ecosystems may be most promising for recovery (Williams and Miller 2006, Williams *et al.* 2006, Gustafson *et al.* 2007). There is not an existing application of stronghold management for salmon or any other freshwater fish, particularly on a large spatial scale. Perhaps the best examples of stronghold management are the key watersheds, which are part of the Aquatic Conservation Strategy of the Northwest Forest Plan (NWFP) that guides management on Federal lands in western Oregon and Washington and northern California, within the range of the northern spotted owl (*Strix occidentalis caurina*). Key watersheds had currently good habitat, the best potential to respond to restoration, or were municipal water supplies, and were distributed across the area of the Northwest Forest Plan (Reeves *et al.* 2006). The purpose of the former two watershed types was to aid in

the recovery of habitat of listed Pacific salmon and other fish. Ten years after the implementation of the NWFP, the proportion of key watersheds (70 percent) whose condition improved was greater than that of non-key watersheds (50 percent). This condition improvement was achieved while allowing timber production and other activities to occur.

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RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. MARIA CANTWELL TO
GUIDO RAHR

Question 1. While each year we spend hundreds of millions of dollars on Pacific salmon recovery, the vast majority of our efforts are going toward salmon stocks that have severely declined and are in very poor shape. While focusing on depleted populations is essential, do you believe this sometimes occurs at the expense of protection for healthy “stronghold” salmon populations?

Answer. Yes. Current Federal salmon funding is primarily directed toward recovery of populations listed as threatened and endangered and restoration of degraded watersheds. This is largely due to Endangered Species Act mandates and a lack of statutory direction to Federal agencies to focus resources on the conservation of healthy wild salmon populations and functioning watersheds.

For example, while NOAA receives significant congressional direction in its appropriations bills, including specifics on how to spend grant funds, the agency has acknowledged that, in part because there is no organic act establishing the agency, it has no statutory funding direction. Accordingly, NOAA decides for itself all the details of most salmon grants (*i.e.*, what purpose, how much, who gets it, matching funds, who partners). Though NOAA can currently undertake projects to conserve healthy wild salmon populations, the agency has not made this a priority because it has no such mandate.

As a result, local stakeholders in salmon stronghold basins often have difficulty garnering sufficient resources to implement prevention-based conservation measures to ensure that healthy wild salmon ecosystems remain healthy. Please see pages 5–6 of my written testimony for specific examples.

Question 2. Do you think the neglect of healthy salmon populations is a fundamental flaw in our Nation's efforts to protect and restore wild Pacific salmon?

Answer. Yes. Scientists have long endorsed the fundamental principle of conserving functioning ecosystems before investing in the restoration of those that are degraded. However, most U.S. laws and regulations that impact watershed health direct public resources toward restoration of basins that are highly degraded and recovery of populations that are in sharp decline. Restoration of impaired systems can be extremely expensive and benefits are often realized long after implementation. Salmon recovery is vital, but will take time. As this process advances, in the absence of a stronghold strategy, the potential opportunity costs of our recovery focus—the degradation of currently healthy ecosystems and reduced viability of strong wild populations—represent a fundamental flaw in Federal salmon conservation policy.

To conserve wild salmon populations into the future, we must implement new management approaches that complement existing recovery efforts by focusing and leveraging investments within salmon strongholds. This stronghold approach must not only support on-the-ground protection, restoration, and monitoring, but also provide opportunities to pilot innovative research and planning activities that address challenges common across multiple strongholds.

While Federal agencies can currently undertake projects to conserve healthy wild salmon populations and their habitat, they rarely do so because they have no such mandate. The Pacific Salmon Stronghold Conservation Act provides the necessary congressional direction to focus Federal resources on conservation of healthy wild salmon ecosystems. This Act will bring together decision-makers representing resource management agencies, tribes, and conservation interests to provide the leadership and coordination necessary to achieve landscape-scale conservation of the watersheds that have the greatest chance of supporting viable salmon populations into the next century. As such, this Act remedies a major flaw in our Nation's efforts to protect and restore wild Pacific salmon.

Question 3. Do you believe the Pacific Salmon Stronghold Conservation Act will succeed in addressing some of the root causes of salmon decline, rather than just superficially treating the symptoms? If so, how?

Answer. The ongoing and widespread declines in wild salmon populations can be traced to many root causes, such as demands for economic growth, inadequate science, cultural norms, and so on. Together these conditions have dominated well over a century of resource management decision-making impacting salmon, and while most, if not all, of these decisions appeared rational when considered in isolation, together they have conspired to bring about the cumulative effects seen today: 28 wild salmon and steelhead populations listed under the Endangered Species Act in the lower 48, thousands of river miles included on the 303(d) list (of impaired water bodies), and billions of dollars spent per year on the restoration of degraded habitats and recovery of listed populations. The common denominator among the forces that brought about these conditions and the Federal policy responses to them has been a consistent lack of investment in prevention.

The Stronghold Act recognizes that the only way to maintain our remaining strong populations is to promote and invest in new management approaches rooted in preventing recurrence of the mistakes of the past while recognizing threats on the horizon. The Pacific Salmon Stronghold Conservation Act will succeed in addressing some of the root causes of salmon decline by focusing resources on activities that promote the development and implementation of prevention-based strategies in salmon strongholds, and conservation policies and management strategies that address threats and reduce limiting factors across multiple strongholds.

This legislation aims to get ahead of the curve by supporting the protection and, if necessary, the restoration of ecosystem processes within healthy salmon-bearing watersheds before they decline. Funds provided under the Pacific Salmon Stronghold Conservation Act will finance locally-supported, prevention-based alternatives to habitat alteration, which promote the health of both stronghold watersheds and the local communities that rely on them. Examples of such prevention-based strategies include wetland and riparian conservation easements, forest preservation for carbon sequestration, promotion of irrigation efficiencies on agricultural land, and improvements in planning for urban and rural development.

In addition to supporting the development and implementation of high value conservation strategies at the watershed level, this Act will support innovative strategies that promote conservation across multiple strongholds. Many threats exist that transcend watershed boundaries, exacerbating the impacts of existing limiting factors and/or creating new ones across multiple basins. Examples of such threats may include: climate change; land use policies, practices, or ownership patterns; non-native species proliferation; government subsidies and antiquated laws; and hatchery

and harvest practices. Unlike basin-specific limiting factors, which often require “on-the-ground” solutions implemented at the watershed or reach scale, these threats can be more effectively addressed through “programmatic” remedies that can reach across multiple strongholds.

Because most Federal and state salmon conservation programs focus financial and technical support on specific watershed level restoration strategies, programmatic solutions are often difficult to design and finance. This is especially true for new and innovative approaches or policies that are untested, but may be applicable and effective across multiple basins. This Act will enable the Salmon Stronghold Partnership Board to develop and support innovative approaches that proactively respond to emerging threats across multiple stronghold basins and address inefficient policies that impede conservation of salmon strongholds. Please see pages 67 of my written testimony for examples of programmatic initiatives.

Question 4. The Pacific Coastal Salmon Recovery Fund has a strong track record of leveraging additional State and local dollars for salmon recovery for every Federal dollar spent. Do you foresee the Salmon Stronghold bill having a similar -multiplier effect,” promoting investment of additional non-Federal funds to support salmon stronghold protection and restoration activities?

Answer. Along with local, state, NGO, and tribal interests, the Stronghold Partnership Board convenes six Federal agencies, each of which oversees programs that are evaluated through the Government Performance Results Act, Performance Assessment Rating Tool, and other performance evaluation approaches employed by the Federal Government. Accordingly, the Board recognizes and places a premium on the role that the Pacific Salmon Stronghold Conservation Act funds must play in leveraging non-Federal investment.

Stronghold grants funds will support two types of projects: (1) “watershed level activities” that implement high value conservation actions to address threats and limiting factors within strongholds; and (2) “programmatic initiatives” that seek to reduce threats or limiting factors occurring across multiple strongholds and in more than one state.

- The types of ‘watershed level’ activities that are funded in strongholds will require a 1:1 ratio of Federal:non-Federal match (unless the project is implemented entirely on Federal lands). The non-Federal match required is greater than that required under PCSRF, which is currently 33 percent (2:1). In addition because of the collaborative nature of the projects that will be supported, we have every confidence, that funds provided under Pacific Salmon Stronghold Conservation Act will have a multiplier effect, much like that of PCSRF. In fact, because PCSRF funds have been spent at a proportionally lower rate in strongholds than in recovery basins (hence the need for the Stronghold Act), we believe that pent up demand for Federal investment in strongholds may stimulate even greater support from non-Federal partners than currently seen in recovery basins. This is particularly true of large foundations, which typically place greater priority on preventative and protection-oriented strategies than those simply focused on restoration.
- Programmatic initiatives represent conservation strategies that are carried out across more than one stronghold in more than state. Because these initiatives will bring together more than one state (and likely multiple NGO’s), funds provided through this Act are anticipated to leverage significantly more state investment than the minimum 33 percent match required by PCSRF. This “primary leverage” derived from considerable state match will drive a multiplier effect similar to or possibly greater than that of PCSRF.

In summary, we are extremely confident in the breadth and depth of non-Federal support available for salmon stronghold conservation and envision a similar, if not greater, multiplier effect to that of PCSRF.

Question 4a. Is this a good deal for Federal taxpayers?

Answer. Conservation of healthy wild salmon populations and intact salmon habitat is much less expensive than recovery and restoration. For example, over the last two decades, the Federal Government has spent more than \$8 billion to recover salmon and steelhead populations in the Columbia River basin alone. In its Draft Recovery Plan (March 2010), the Lower Columbia Fish Recovery Board estimates that habitat restoration projects will cost approximately \$1 million per mile for the larger river systems in the Lower Columbia River basin (page 10-7).

Contrast this with the costs of proactively conserving a healthy wild salmon ecosystem—for example, the Hoh River on Washington’s Olympic Peninsula. The Wild Salmon Center and our partners acquired 4,500 acres of forest land along the Hoh River for roughly \$9 million. These acquisitions provided long term protection for

half of the private land along the Hoh River corridor and ensured that 80 percent of the floodplain and riparian lands are in conservation status. The Hoh River Trust recently purchased an additional 2,000 acres for \$2 million. In total, 7,000 acres and 29 river miles along the Hoh River were protected for \$11 million—significantly less than it would have cost to restore the ecosystem. It is also important to note that some of this land will remain in timber and/or agricultural production (using sustainable and certified “salmon friendly” practices), so while harm to wild populations has been prevented, the potential for economic returns from the land has not been significantly diminished.

By making strategic investments in proactive conservation of salmon strongholds now, we will save billions of dollars in future restoration, stock rebuilding, and emergency funding over the long run.

Question 5. Some may have a concern that once this bill is enacted and implemented, the Pacific Salmon Stronghold Partnership will become just another layer in an already vast bureaucracy of salmon management? Are there steps for implementing this bill that you view as essential to make sure that we truly realize the added value we’re trying to achieve by creating the Partnership?

Answer. The governance structure that oversees the management of salmon resources is indeed broad and complex, and concerns about adding yet another layer are well founded. Fortunately, sponsors of the Pacific Salmon Stronghold Conservation Act took deliberate steps to avoid adding yet another layer of bureaucracy in its administration. First and foremost, the sponsors were careful to craft a bill that had no regulatory or enforcement authority. The vast majority of criticism leveled at the current governance structure stems from overlapping authorities and jurisdictions concerning harvest management, hatchery production, consultations required under the Endangered Species Act, and planning required under the National Environmental Policy Act. Nothing within this Act adds to or amends these requirements.

Second, the centerpiece of this legislation is the establishment of a grant program to advance the Act’s fundamental purpose of expanding Federal support for and attention to the conservation of wild salmon strongholds. In establishing this grant program, sponsors were careful to rely on existing grant mechanisms to avoid creating new processes. The well established and highly respected National Fish and Wildlife Foundation (NFWF) will act as the fiscal administrator of the grant program. NFWF will work with an existing partnership (the Salmon Stronghold Partnership Board) to establish priorities, and rely on existing state grant programs to select and administer projects specific to each state. Multi-state projects will be selected and administered by NFWF in collaboration with the Salmon Stronghold Partnership Board. No new entities will be created to manage the grants program.

Finally, participation in the program is entirely voluntary, so any management and administration burdens assumed by grant recipients are done so willingly. Furthermore, this Act limits state and NFWF grant administration costs to just 5 percent, so these entities will not be able to significantly expand their management and administrative staff capacities through the stronghold effort.

Question 6. Salmon are a treaty species whose range includes Pacific Rim countries. Won’t a network of salmon strongholds require international cooperation?

Answer. The North Pacific’s marine and freshwater ecosystems and food webs are interdependent, linked by salmon as a keystone species. Pacific salmon populations spend a considerable part of their life-cycle migrating across the North Pacific before returning to their natal rivers. As such, the management actions of one North Pacific nation affect the wild salmon populations of another. It is essential, therefore, that North Pacific nations work together to share best management practices, innovative conservation strategies, status and trends data, and lessons learned to conserve wild salmon populations into the future. Scientific, management, and conservation cooperation among the salmon-bearing countries of the Pacific Rim will be critical to maintaining a network of the most abundant and diverse wild salmon ecosystems across the species’ range.

The Salmon Stronghold Partnership and the introduction of the Pacific Salmon Stronghold Conservation Act are already fostering international cooperation with Canada. Referencing the Act, the Pacific Fisheries Resource Conservation Council, an independent advisory body to the Federal Minister of Fisheries and Oceans and the British Columbia Minister of Fisheries, stated that “[t]he establishment of coordinated coast-wide Salmon Strongholds programs by both countries could provide a highly effective demonstration of environmental cooperation.” See *Applying the Salmon Stronghold Concept in Canada* at 20 (2009). The Council also recommended that “[f]unding for a Salmon Stronghold initiative by the Government of Canada

should be considered in light of the impending national funding in the United States.” *Id.*

Question 7. What are other Pacific Rim countries doing to conserve salmon strongholds?

Answer. Efforts to conserve salmon strongholds are underway in both Canada and Russia. In Canada, the salmon stronghold concept was first discussed by fisheries managers and scientists in the 1990s due to increased deterioration of salmon habitat and the ineffectiveness of reactive salmon conservation policies. In 1999, the Pacific Salmon Foundation published a report entitled *Living Blueprint for B.C. Salmon Habitat* that identified the need for a policy shift in Canada toward proactive conservation of healthy wild salmon ecosystems. While the premise was accepted, a salmon stronghold policy was not immediately implemented due to salmon stock collapses and immediate threats that took precedent at the time.

In 2005, Canada adopted a Wild Salmon Policy with a primary goal of restoring and maintaining healthy and diverse salmon populations and their habitats. The policy identifies conservation of wild salmon populations and their habitat as “the highest priority for resource management decision-making.” See *Canada’s Policy for Conservation of Wild Salmon* at 8. The policy also recognizes the importance of conserving healthy wild salmon populations, stating “[t]o safeguard the long-term viability of wild Pacific salmon in natural surroundings, the Department will strive to maintain healthy populations in diverse habitats.” *Id.* However, it was not until 2009 that this recognition gained traction.

The Pacific Fisheries Resource Conservation Council (PFRCC) published a report in June 2009 entitled *Applying the Salmon Stronghold Concept in Canada*. The report recommended that Canada: (1) adopt a salmon stronghold approach, (2) participate in the North American Salmon Stronghold Partnership, and (3) test the Salmon Strongholds approach in Canada, in conjunction with the Wild Salmon Center, through a six-month pilot project to determine the most practical and effective forms for Canadian involvement. See *Applying the Salmon Stronghold Concept in Canada* at 22–23.

After publication of this report, PFRCC became an ex officio member of the North American Salmon Stronghold Partnership Board. They implemented a salmon stronghold pilot project on the Harrison River in June 2009, and the Harrison River basin was officially designated as Canada’s first salmon stronghold in February 2010. Passage of the Pacific Salmon Stronghold Conservation Act will likely accelerate Canada’s efforts to conserve salmon strongholds (see response to question #2 herein).

Russia is also undertaking significant salmon stronghold conservation efforts. In 2006, Russia established the world’s first salmon refuge on the Kamchatka Peninsula—a 544,000 acre headwaters to ocean salmon sanctuary aimed explicitly at protecting some of the most abundant runs of salmon and rich species diversity on the pristine Kol River. A globally-significant salmon stronghold, the Kol River contains one of the richest known assemblages of wild salmonids, including all six Pacific salmon species, as well as steelhead, rainbow trout, Dolly Varden char, and white-spotted char. The Wild Salmon Center has constructed a permanent biostation and laboratory facilities on the Kol, providing an unparalleled opportunity for scientists to study salmon in a pristine habitat. We are working collaboratively with the Kamchatka Administration, the Kol Protected Area Administration, and other national and international partners to support the management of the Kol River Salmon Protected Area and to develop new opportunities to protect priority watersheds throughout the peninsula.

In addition, as a result of fifteen years of efforts by the Wild Salmon Center and our partners, the government of the Sakhalin Region in the Russian Far East granted permanent protected status to the 67,305 hectare Vostochnii Nature Reserve, a salmon/marine nature preserve encompassing two entire ocean-draining basins, in 2007. The Vostochnii protects some of Sakhalin’s last remaining old-growth conifer forests, providing ideal conditions for supporting robust runs of all five salmon species found on Sakhalin. Logging and unsustainable commercial fishing in the Pursh-Pursh, Vengeri and neighboring Langeri basins have been stopped, and poaching for salmon roe (caviar), which is epidemic in the Russian Far East, has been practically eliminated.

In 2009, the Russian Federal Fishery Agency passed a decree on creating Federal Fishery Protected Zones (FFPZ) and held a prioritization workshop for high priority rivers that established three categories of FFPZs—the first being the protection of the wild salmon gene pool (salmon strongholds). Using criteria that were informally agreed upon for the three types of reserve zones, a list of rivers for the six regions was developed with the participation of the Federal Fishery Agency, Regional Administration authorities, and other government bodies. Once implemented, the re-

serve zones for healthy wild salmon populations will provide critical Federal protection for some of the best wild salmon ecosystems in the Russian Far East.

Question 8. What lessons has the Wild Salmon Center learned from its overseas experiences working to conserve salmon strongholds in other countries?

Answer. Wild Salmon Center has learned a great deal from our work to conserve salmon strongholds in other countries. The biggest lesson we have learned is that if we do not heed the mistakes that we've made in Europe, Japan, Canada, and the East Coast of the U.S., we will fail to conserve wild salmon populations for future generations. The Achilles heel for salmon is that history keeps repeating itself—we need to break the cycle. Some of the key mistakes we've made are: (1) taking action to recover wild salmon stocks only after they have reached low levels of abundance, (2) replacing native, locally-adapted genetic stocks with hatchery-bred salmon, and (3) focusing on restoration once a healthy watershed has been damaged instead of protecting it at the forefront.

Once lost, habitat is politically and economically expensive to reclaim. It is much cheaper and easier to protect habitat than to restore it after it has been damaged. This lesson can be illustrated in Japan. More than 98 percent of Japan's salmon rivers have been dammed and artificially modified, so that commercial fisheries now rely heavily on hatcheries in order to maintain their productivity. Hatcheries will never be able to replace highly productive wild salmon ecosystems. While there are still a few free-flowing rivers left in Japan, the extensive loss of wild salmon ecosystems cannot be remedied. However, we can learn from this mistake by conserving our remaining healthy wild salmon ecosystems in Japan and elsewhere.

We have also learned that it takes local leadership and collaborative multi-stakeholder cooperation to achieve lasting wild salmon conservation. For example, on Sakhalin Island in the Russian Far East, a long-term, public-private partnership between international, regional and local organizations has achieved lasting and substantial gains in protecting and restoring the ecological health of the eastern (Okhotsk Sea) coast of Smirnykh District, and in particular three highly productive river basins that form an ecological anchor for the region: the Pursh-Pursh, Vengeri and Langeri rivers. This integrated landscape-scale conservation project combines significant habitat protections and innovative strategies to ensure the sustainability of wild salmon fisheries, and comprehensive stakeholder engagement. Innovative elements include establishing one of the first, government-endorsed public-private watershed councils in Russia, raising environmental and social standards for resource extraction companies, and leading the demonstration of the local economic benefits that can be gained from adopting sustainable commercial fishing practices. Project partners are also combating poaching directly through organizing community anti-poaching brigades and patrolled checkpoints on access roads in collaboration with local enforcement agencies. As a result, poaching and illegal access to the most pristine areas of the rivers has been brought under control for the first time, and can be viewed as a model for addressing poaching elsewhere in the Russian Far East. The creation of a partnership across local, regional, and international jurisdictions, uniting business, communities, and government to achieve a common goal, has been central to success in the Sakhalin region and is a sound replicable model.

Another lesson learned is that Pacific salmon are a global resource, so we cannot merely consider our own nation when developing strategies to conserve and manage wild salmon populations. Since wild Pacific salmon spend a portion of their life-cycle migrating across the North Pacific Ocean, management practices in one country affect the salmon populations of another. It is critical that we work with neighboring countries to ensure sustainable harvest practices, limit the impacts of hatcheries, and conserve a network of the healthiest wild salmon ecosystems across the North Pacific.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. OLYMPIA J. SNOWE TO
GUIDO RAHR

Question 1. The National Marine Fisheries Service (NMFS) has dedicated significant resources to Pacific salmon conservation and management—upwards of \$117 million in 2010 alone for the Pacific Coastal Salmon Recovery Fund (PCSRF) and other “salmon management activities.” NMFS also receives funding from two international funds with an endowment of approximately \$135 million through the U.S./Canadian Pacific Salmon Commission. S. 817 would authorize an additional \$30 million annually to establish a grant program that would focus on maintaining currently healthy habitat for Pacific salmon. What authorities does the legislation bring to fisheries habitat conservation that does not already exist?

Answer. The Pacific Salmon Stronghold Conservation Act provides congressional direction to focus Federal resources on preventative, proactive efforts to conserve healthy wild Pacific salmon ecosystems through the establishment of a Salmon Stronghold Partnership program and the Salmon Stronghold Partnership. By directing the National Oceanic and Atmospheric Administration (NOAA) to establish a salmon stronghold watershed grants and technical assistance program, this Act provides clear statutory funding direction to focus resources on the conservation of healthy wild salmon populations and their habitat as a complement to ongoing salmon recovery efforts. This legislation also authorizes Federal participation in the Salmon Stronghold Partnership and requires Federal agencies responsible for acquiring, managing, or disposing of Federal lands within salmon strongholds to cooperate with NOAA to conserve salmon strongholds. None of these authorities currently exists.

Though NOAA uses an assortment of authorities when it administers grants today—from the Endangered Species Act and the Marine Mammal Protection Act to the Pacific Salmon Treaty—these authorities provide almost no specific congressional direction to the agency, and are primarily focused on the recovery of threatened and endangered salmon stocks. Further, while NOAA receives significant congressional direction in its appropriations bills, including specifics on how to spend grant funds, the agency has acknowledged that, in part because there is no organic act establishing the agency, it has no statutory funding direction. As a result, NOAA determines the guidelines and details of most salmon grants (*i.e.*, what purpose, how much, who gets it, matching funds, who partners) on its own, and allocates the majority of its salmon funding toward recovery and restoration efforts.

This is illustrated through the existing funding sources mentioned above. NOAA dedicates significant funding to support Pacific salmon conservation and management activities, primarily through the Pacific Coastal Salmon Recovery Fund (PCSRF), Salmon Management Activities related to the implementation of the Pacific Salmon Treaty, and Pacific Salmon Commission Restoration and Enhancement funds. Unfortunately, none of these funding sources supports prevention-based strategies to conserve strong wild salmon populations before they decline or healthy salmon-bearing watersheds before they are degraded. Further, they fail to support innovative strategies to address threats to healthy wild salmon populations that transcend watershed and state boundaries.

For example, the Pacific Coastal Salmon Recovery Fund supports projects necessary for the conservation of salmon and steelhead populations that are listed as threatened or endangered under the Endangered Species Act (ESA), or identified by a state as at-risk or to be so-listed; for maintaining populations necessary for exercise of tribal treaty fishing rights or native subsistence fishing; or for conservation of Pacific coastal salmon and steelhead habitat. In Washington, Oregon, Idaho, and California, PCSRF funding is largely directed toward the Federal mandate to recover ESA-listed salmon and steelhead populations, and allocated based on priorities identified in salmon and steel head recovery plans. In Alaska, which currently has no ESA-listed salmon populations, PCSRF funding is limited to habitat conservation efforts. As such, it cannot be used to proactively tackle other factors that may pose serious threats to salmon populations like climate change, development, and non-native species proliferation, all of which the Pacific Salmon Stronghold Conservation Act seeks to address through innovative, prevention-based strategies.

Similarly, Pacific Salmon Commission Restoration and Enhancement funds (“Northern and Southern funds”) are primarily directed toward the enhancement of wild stock production and the development of improved information for resource management, rather than proactive strategies to conserve healthy wild salmon populations. The Pacific Salmon Commission has identified three primary goals for the Northern and Southern Boundary funds: (1) development of improved information for resource management, including better stock assessment, data acquisition and improved scientific understanding of limiting factors affecting salmon production in the freshwater and marine environments; (2) rehabilitation and restoration of marine and freshwater fish habitat, and improvement of habitat to enhance productivity and protection of Pacific salmon; and (3) enhancement of wild stock production through low technology techniques rather than through large facilities with high operating costs. Over the last few years, the majority of the Northern and Southern funds have been spent on Goals 1 and 3, with only a small percentage allocated toward habitat restoration and rehabilitation. In addition, according to the Northern Fund Committee’s 2009 Call for Proposals, “[T]he Committee believes that large-scale habitat rehabilitation, habitat monitoring, habitat protection, and land acquisition are more appropriately addressed by other agencies and organizations.”

By establishing a Salmon Stronghold Partnership program, this legislation will complement existing salmon funding sources and enable resource managers to get

ahead of the curve in conserving wild salmon over the long term. In addition, this Act will enhance cooperation and coordination among Federal resource agencies and other stakeholders in implementing prevention-based strategies to conserve salmon strongholds across diverse land ownerships and jurisdictional boundaries.

Question 1a. Could resource managers not already use their existing funds for this purpose?

Answer. Though NOAA can currently undertake projects to conserve healthy wild salmon populations and their habitat, the agency rarely does so because it has no such mandate (see answer to question (1) above). That is why the Pacific Salmon Stronghold Conservation Act is so vital it requires NOAA to undertake a complementary approach to its current recovery focus by protecting and restoring healthy wild Pacific salmon ecosystems.

In addition, current salmon funding programs are not built to address Pacific salmon conservation goals on a regional scale. For example, PCSRF funds are allocated on a state by state basis. Each state allocates funds to recovery basins for habitat protection and restoration actions, and priorities are determined by each recovery basin (*e.g.*, Lead Entities in WA). While these efforts are critical, resource managers must also assess emerging threats that transcend watershed and state boundaries. These cross-cutting threats—like invasive species proliferation and climate change—have great potential to exacerbate the impacts of existing limiting factors, while creating new ones. Unlike basin-specific limiting factors, however, which often require “on-the-ground” solutions implemented at the watershed scale, these threats can be more effectively addressed through “programmatic” remedies that operate across multiple strongholds. This Act will enable the Salmon Stronghold Partnership to develop and support these crosscutting, programmatic remedies.

Question 1b. If the potential economic payback of stronghold activities is so great, why have they not focused more resources on such projects?

Answer. This is partially due to the dire state of many Pacific salmon populations across the West Coast. As I mentioned in my testimony, salmon are now extinct over 40 percent of their native range, and many other salmon populations have declined to the point that they are protected under the Endangered Species Act. As a result, Federal agencies are spending the majority of their resources responding to the crisis of the day (like the Sacramento Chinook collapse) and restoring highly impacted systems.

In addition, the failure to allocate resources to proactive conservation efforts is likely because the payback from those efforts is harder to account for. It is much easier to track the return of an investment in restoration, where miles restored or fish passage barriers removed are easily quantified, than it is to evaluate preventative measures that are targeted to maintaining healthy ecosystem functions. This is a paradox for two important reasons: (1) it is less expensive to conserve healthy wild salmon populations and intact watersheds than it is to rebuild imperiled stocks or restore degraded habitat; and (2) the desired outcome—a functioning ecosystem supporting healthy wild salmon populations—is far more likely to be secured through prevention-based strategies than through restoration approaches.

If we do not implement a new policy to focus Federal resources on the conservation of healthy wild salmon ecosystems in the near term, we will continue to see the health of our wild salmon populations decline and may lose our opportunity to stem the tide of wild salmon population loss and extinction.

Question 2. In 2006, the Departments of Commerce and Interior joined forces with the Association of Fish and Wildlife Agencies to publish the National Fish Habitat Action Plan, a document that developed a strategy to protect, restore, and enhance the Nation’s fisheries ecosystems. This Action Plan established a Governing Board of up to 20 members from state and Federal agencies, the conservation and science communities, and industry representatives tasked with coordinating involvement and raising awareness of and funding for fish habitat considerations. How would the Stronghold Partnership differ from and coordinate with this Governing Board?

Answer. The Salmon Stronghold Partnership Board differs from the National Fish Habitat Board in a number of ways, most notably in its membership, purpose, and scale of focus.

The Salmon Stronghold Partnership is a public-private partnership among Federal, state, tribal, and local governments, private landowners, and nongovernmental organizations working across political boundaries, government jurisdictions, and land ownerships to identify and conserve the healthiest wild Pacific salmon ecosystems in Alaska, Washington, Oregon, Idaho, and California.

The Salmon Stronghold Partnership Board is the executive body of the Salmon Stronghold Partnership. The Board will consist of 19 to 21 representatives with strong scientific or technical credentials and expertise, as follows: one representative

from each of the National Marine Fisheries Service (NMFS), the U.S. Fish and Wildlife Service (FWS), the Forest Service, the Environmental Protection Agency, the Bonneville Power Administration, the Bureau of Land Management, and the Northwest Power and Conservation Council; one representative from each of the States of Alaska, California, Idaho, Oregon, and Washington; not less than three and not more than five representatives from Indian tribes or tribal commissions located within the range of Pacific salmon; one representative from each of three non-governmental organizations with salmon conservation and management expertise; one national or regional representative from an association of counties; and representatives of any other entities with significant resources regionally dedicated to the protection of salmon ecosystems that the Board determines are appropriate. The Pacific Fisheries Resource Conservation Council, an independent advisory body to the Canadian Minister of Fisheries and Oceans and the British Columbia Minister of Fisheries, is also participating on the Board as an Ex Officio member.

The primary purposes of the Board will be to: (1) develop and support strategies focusing on the conservation actions projected to have the greatest positive impacts on wild salmon abundance, productivity and/or diversity in and across salmon strongholds, and (2) provide criteria for the prioritization of projects funded under the Salmon Stronghold Partnership program. In developing proactive strategies to prevent the decline of healthy wild salmon ecosystems and criteria for the prioritization of projects, the Board will not limit its scope to habitat conservation. Instead, it will consider all of the factors affecting the health of salmon strongholds (*e.g.*, harvest, hatchery influence, and habitat alteration) at both watershed and region-wide scales.

In contrast, the National Fish Habitat Board focuses on fish habitat conservation—both healthy habitats and those that are degraded—at a nationwide scale in an effort to establish national goals and priorities, designate Partnerships, and review and make recommendations regarding fish habitat conservation projects. The Board will be composed of 27 members, including: the Director of the FWS; the Assistant Administrator of the NMFS; the Chief of the Natural Resources Conservation Service; the Chief of the Forest Service; the Assistant Administrator for Water of the Environmental Protection Agency; the President of the Association of Fish and Wildlife Agencies; the Secretary of the Board of Directors of the National Fish and Wildlife Foundation; four representatives of State agencies, one of whom shall be nominated by a regional association of fish and wildlife agencies from each of the Northeast, Southeast, Midwest, and Western regions of the United States; one representative of the American Fisheries Society; two representatives of Indian tribes, of whom one shall represent Indian tribes from the State of Alaska, and one shall represent Indian tribes from the other States; one representative of the Regional Fishery Management Councils; one representative of the Marine Fisheries Commissions; one representative of the Sportfishing and Boating Partnership Council; and ten representatives selected from each of the following groups: the recreational sportfishing industry, the commercial fishing industry, marine recreational anglers, freshwater recreational anglers, terrestrial resource conservation organizations, aquatic resource conservation organizations, the livestock and poultry production industry, the land development industry, the row crop industry, and natural resource commodity interests, such as petroleum or mineral extraction.

The National Fish Habitat Board and Salmon Stronghold Partnership Board have three representatives from the same Federal agencies—NMFS, FWS, and the Forest Service—and two representatives from the same non-governmental organizations (NGO's)—Trout Unlimited and The Nature Conservancy. Aside from these five members, and potentially one state representative (depending on the Western State appointment to the National Fish Habitat Board), membership is quite different among these two bodies. Both the Federal agencies and the NGO's participating on the Boards recognize the differences between these two efforts and the value of supporting both.

The Salmon Stronghold Partnership Board will coordinate with Fish Habitat Partnerships (FHPs) that overlap with its focal area (*i.e.*, salmon strongholds across Alaska, Washington, Oregon, Idaho, and California) to avoid duplication of efforts and potentially fill the gaps that Fish Habitat Partnerships do not address, either geographically or through programmatic initiatives that address challenges across multiple basins. This cooperation and coordination will be necessary in Alaska, since the state has been identified as a regional salmon stronghold and contains three recognized FHPs. Members of the Salmon Stronghold Partnership Board will initiate discussions with the Alaska FHPs at a National Fish Habitat meeting in Anchorage this summer to determine how the partnerships can work together in the State.

Question 3. Some principles of conservation biology would support the stronghold concept. However, finding examples of existing “stronghold” programs is difficult. How would you describe the defining characteristics of a species “stronghold”?

Answer. The Pacific Salmon Stronghold Conservation Act defines a “salmon stronghold” as “all or part of a watershed that meets biological criteria for abundance, productivity, diversity (life history and run timing), habitat quality, or other biological attributes important to sustaining viable populations of salmon throughout their range.” S. 817, 111th Cong. § 3(8) (2009). Because the stronghold approach seeks to sustain viable populations “across their range,” and abundance and diversity decrease dramatically from strongholds in the north to those in the south, the term “stronghold” is relative. Each stronghold is identified and can only be described within the context of the distinct geographic areas that conservation planners use to organize the enormous landscape that supports wild salmon. These areas are known as ecological regions, or “eco-regions.” Within the eco-regions of CA, OR, WA, and ID (and southern British Columbia), partners are convening to evaluate wild populations and identify “core strongholds.” Because of the extraordinary abundance and diversity of wild salmon populations throughout Alaska, the Act recognizes the entire state as a salmon stronghold. Despite the variations across eco-regions in the lower 48 states, some common characteristics exist, which may be summarized as follows:

1. *Strongholds meet the highest values for wild salmon abundance and diversity.* Salmon strongholds support the greatest assemblage of wild salmon species with high abundance and productivity and minimal influence of hatchery-reared populations within an eco-region. Wild populations demonstrate a high diversity of life history strategies, providing a significant buffer against population extirpation in the event of a short or long term disturbance to the system. The first step in identifying salmon strongholds is for experts within each eco-region to score populations according to three criteria: abundance and productivity, percent natural origin spawners, and life history diversity.

2. *Strongholds make the highest proportional contributions toward meeting conservation goals within an eco-region.* In his testimony on the Pacific Salmon Stronghold Conservation Act, Dr. Gordon Reeves with the U.S. Forest Service stated, “[T]he identification and selection of a stronghold is premised on principles of systematic conservation design, which are well established in the scientific literature (see Soule and Terborgh 1999). These include: (1) comprehensiveness—the extent to which the network protects the desired level of biodiversity and abundance; (2) irreplaceability—the inclusion of areas or populations that are necessary to achieve the conservation goals; and (3) efficiency—the network is designed [in] the most efficient manner that achieves the conservation goals while minimizing the area involved.” By entering stronghold data collected through “expert scoring” (#1 above) into network design software, conservation planners can identify those locations that support the highest proportions of an eco-region’s overall wild salmon production within a small area (relative to the entire eco-region). Investment in those locations—salmon strongholds—will yield the biggest bang for our buck in conservation returns.

3. *Strongholds contain relatively unfragmented and ecologically intact habitats.* Scientists have conducted extensive research that clearly demonstrates the adverse impacts of aquatic and terrestrial habitat fragmentation and degradation on the abundance and diversity of wild salmon populations. Salmon strongholds contain high value and intact riparian, instream, wetland, and (sometimes) estuarine habitats that are well connected across the watershed. Trophic systems (the foodweb) are intact, invasive species infiltration minimal, and key areas of refugia are relatively unaltered. In short, the salmon stronghold system is functioning with minimal human disturbance relative to the other parts of the eco-region.

Question 3a. What precedents exist for this type of management, and have stronghold management approaches resulted in measurable conservation gains for the target species?

Answer. A key purpose of conservation biology is “to retain the actors in the evolutionary play and the ecological stage on which it is performed” (quote of G.E. Hutchinson in Meffe and Carroll 1999). The establishment of strongholds, also known as reserves, is a primary tool for meeting this goal and has been employed around the world to help protect a vast number of organisms and resources (Margules and Pressey 2000). Generally, these are areas that currently have strong populations and intact, functioning ecosystems because conservation actions are most successful before populations or ecosystems begin to decline. Strongholds have been established primarily for marine and terrestrial systems. The stronghold net-

work proposed by the current legislation would be one of the first for freshwater fish.

While many strongholds and stronghold networks have been established, it is difficult to fully assess their success (Gaston *et al.*, 2006). The reasons for this include the: (1) paucity of systematic data; and (2) incompatibility of data that has been collected to measure the performance of the individual efforts. However, studies that have evaluated strongholds and stronghold networks found that them to be generally successful in meeting their conservation objectives.

For example, the North American Flyway, which is a series of reserves on public and private lands along the migratory corridors of waterfowl that were established by the Migratory Bird Treaty Act, has helped to maintain healthy waterfowl populations (Nichols *et al.*, 1995). Similarly, Halpern (2003) reviewed the biological response to the establishment of 89 marine reserves worldwide and found that the density of fish was 2 times greater, biomass was 3 times greater, and size and diversity were 20–30 percent higher in reserves than in adjacent areas. The effects of the reserves increased with the size. Rates of declines of biodiversity in English reserves were generally lower than or similar to compared to declines to outside areas (Gaston *et al.*, 2006). In addition, trends were most positive in larger protected areas. For example, Andam *et al.*, (2008) estimated that forest reserves in Costa Rica reduced deforestation by 10 percent.

Scientists have suggested the stronghold (or similar) approach for several years. Williams *et al.*, (1989) and Moyle and Yoshiyama (1994) were among the earliest to argue for this approach. Williams *et al.*, noted that no freshwater fish that was listed under the Endangered Species Act (ESA) up to that time had been removed because it recovered sufficiently. The number of freshwater fish listed under the ESA continues to increase, while few have been delisted to date (Williams and Miller 2006).

As Pacific salmon, and other native fish, in the western United States continue to decline, scientists are renewing the call for the protection of areas with the strongest and most diverse populations and most intact ecosystems (Williams and Miller 2006, Williams *et al.*, 2006, Gustafson *et al.*, 2007). Unfortunately, I am not aware of any example of where the stronghold approach has actually been applied for salmon or any other freshwater fish, particularly on a large spatial scale. Perhaps the best examples are the key watersheds, which are part of the Aquatic Conservation Strategy of the Northwest Forest Plan (NWFP) that guides management on Federal lands in western Oregon and Washington and northern California, within the range of the northern spotted owl (*Strix occidentalis caurina*). Key watersheds had currently good habitat, the best potential to respond to restoration, or were municipal water supplies, and were distributed across the area of the Northwest Forest Plan (Reeves *et al.*, 2006). The purpose of the former two types was to aid in the recovery of habitat of listed Pacific salmon and other fish. Ten years after the implementation of the NWFP, the proportion of key watersheds (70 percent) whose condition improved was greater than that of non-key watersheds (50 percent). This was achieved while allowing timber production and other activities to occur.

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Question 3b. If the concept of a “stronghold” is based largely on where the species has a relatively large population and intact habitat (*i.e.*, mostly based on ecological criteria), how are human economic and social needs taken into account when selecting “stronghold” sites?

Answer. The identification of salmon stronghold sites is based entirely on biological criteria, which includes abundance and productivity, “wildness” (influence of hatchery-born fish), and diversity of wild Pacific salmon and steelhead populations. Reliance on biological criteria in the determination of stronghold boundaries ensures that the effort to conserve strong populations is built on a foundation of solid science that accurately reflects population health and viability. This science-driven approach is essential if we are to accurately identify strongholds and carry out the intent of the Pacific Salmon Stronghold Conservation Act.

While a portfolio of watersheds is conferred stronghold status based on science, economic and social needs will be taken into account when decisions are made concerning where funds provided under this Act are invested. The Stronghold Partnership’s Charter states that the Salmon Stronghold Partnership Board will consider the extent to which a project will “protect, improve, or promote local economic opportunities associated with healthy salmon stronghold habitats and/or populations, including responsible and sustainable resource use related to fishing and recreation” when the Board determines annual priorities for funding. NASSP Charter, Section 5.2.5. By evaluating the potential of a project to deliver economic benefits to stronghold communities, the Board will consider not only the health of wild salmon populations, but also the communities and economies that they help sustain.

The Board’s intent to consider economic and social needs in its determination of funding priorities can also be illustrated through the “Rudio Creek” project, which the Partnership helped fund in 2008. Undertaken through a broad partnership, the Rudio Creek project supported a rancher’s efforts in the John Day basin to increase the efficiency of his irrigation practices while promoting the health of strong salmon and steelhead populations. The major objectives of the project were to keep water in a critical spawning and rearing tributary, Rudio Creek, while supporting the rancher’s needs for improved and more dependable irrigation infrastructure. Recently completed, the project was hailed as a great success by the landowner and the range of state, Federal, and private partners involved. All of these parties applauded the project as a win-win in its capacity to conserve local natural resources, while promoting the economic health of a vital local ranching industry. Integrating all three components—environmental, economic, and social needs of the communities that lie within strongholds—into the development of a project supports what is known as “the triple bottom line,” which is widely recognized as critical to building lasting partnerships and implementing broadly supported projects in rural regions.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. MARIA CANTWELL TO
JOE CHILDERS

Question 1. The salmon fisheries in Alaska are in a much healthier state than most salmon fisheries in the Pacific Northwest. Yet the vitality of these fishing communities depends upon the health of Alaska’s salmon populations. What is the value of salmon fisheries to coastal communities who depend upon them?

Answer. Alaska’s salmon fisheries generated \$370 million in ex-vessel value in 2009, according to the Alaska Department of Fish and Game. This equates to roughly \$1.1 billion in first wholesale value, according to the Alaska Seafood Marketing Institute. It is difficult to quantify how much of the fishing income is retained within fishing communities but Alaska residents comprise approximately 75 percent of

salmon permit holders and roughly half of crew jobs, so it is expected that salmon income to harvester and processor sectors is likely to exceed \$500 million in Alaska communities. In many of these communities there is very little other opportunity for employment. Many coastal communities depend on the local community's share of the 3 percent fish tax to support schools, police, public docks, and other services. Enhancement taxes from salmon fisheries are used within the region collected for enhancement projects that in return benefit all users, commercial, sport, and personal use.

Question 2. How would Alaska and its communities change if your salmon populations experienced severe declines similar to those experienced by other regions?

Answer. If Alaska suffered salmon declines as have been seen elsewhere, some Alaska coastal communities would cease to exist. With no option for other employment, residents would be forced to move away. For many families, commercial salmon fishing provides for the income to support a subsistence lifestyle. Without income from salmon harvest and processing, only a handful of major ports that have diversified groundfish, finfish, and shellfish fishing fleets or other job opportunities would survive. Loss of the salmon sector would likely also cripple many of these diversified ports with increased unemployment from the loss of processing, hatcheries, and management funding.

Question 3. How would such declines impact fishermen from other states like Washington who also depend on Alaskan's salmon runs?

Answer. 1,856 Washington State residents, 330 Oregon residents, and 281 California residents held Alaska salmon fishing permits in 2009, as well as residents of 43 other states. These independent mostly small family business owners would likely be displaced and unemployed. Crew counts are not so closely counted, but in 2007 there were crew licenses issued to 8,400 non-Alaska residents, with the majority of these working on salmon vessels. These individuals would also likely be displaced. In addition value added processing and cold storage facilities with extensive historic ties to the Alaska salmon industry are located in many West coast communities, and many of these businesses would fail or face cutbacks in employees without Alaska salmon to process. If a major reduction in salmon production were to occur, the cost of almost all consumer goods in the state would rise due to the loss of the backhaul container capacity.

Question 4. With so much money and attention going toward depleted salmon populations, do you feel like Alaska's largely healthy salmon populations get the 'short end of the stick'?

Answer. In some ways, yes. The kinds of projects, studies, and funding needed to maintain healthy salmon stocks are different than those intended to restore threatened salmon. We are not confident that the message sent regarding the demise of the West coast salmon habitat and subsequently the salmon, is well understood by the public in Alaska. It would be beneficial to describe for the Alaska public, the various policies adopted elsewhere that have proven to be so detrimental to salmon and salmon habitat, so that they can potentially be avoided in the future, everywhere.

Question 5. If more attention isn't given to salmon strongholds in the future, would you consider that to be a threat to Alaska's salmon populations?

Answer. Yes. Without this attention to salmon everywhere they exist, there will be little awareness of the wide range of threats to salmon everywhere. The same attention applied elsewhere to preserve salmon needs to be translated into public policy and applied on a project by project basis to prevent harm in Alaska.

Question 6. Since Alaskan salmon stocks benefit not only fishermen from Alaska, but also fishermen from Washington State and Oregon, don't we all be have an interest in maintaining the healthy status of Alaska's salmon populations?

Answer. Yes, there are financial benefits not only to Washington, Oregon, and California and to 43 other states that derive direct income from salmon fishing. The economic engine derived from salmon fishing employs many thousands of people on the West coast certainly, but also throughout the U.S. No less important, of course, is the fact that millions of Americans enjoy a sustainable and extremely healthful protein source.

Question 7. Aren't Alaska's salmon populations simply too important to be taken for granted?

Answer. Yes, we agree. Alaska is a salmon stronghold today. Not very long ago, so was the entire west coast, and before that so was the east coast. Alaska's salmon populations and watershed strongholds are nothing less than national treasures.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. OLYMPIA J. SNOWE TO
JOE CHILDERS

Question 1. The National Marine Fisheries Service (NMFS) has dedicated significant resources to Pacific salmon conservation and management—upwards of \$117 million in 2010 alone for the Pacific Coastal Salmon Recovery Fund (PCSRF) and other “salmon management activities.” NMFS also receives funding from two international funds with an endowment of approximately \$135 million through the U.S./Canadian Pacific Salmon Commission. S. 817 would authorize an additional \$30 million annually to establish a grant program that would focus on maintaining currently healthy habitat for Pacific salmon. What authorities does the legislation bring to fisheries habitat conservation that does not already exist?

Answer. Existing Federal authorities such as the Endangered Species Act and Pacific Coast Salmon Recovery Fund primarily target fish populations and habitats that are already suffering decline or imminent threats in a reactive manner. Yet it is very expensive and difficult to restore populations, undo environmental harm after it is done, or redirect harmful activities once established. The resulting history of salmon populations worldwide is a sad story of serial depletion.

The Act would proactively provide the opportunity to identify salmon strongholds and then support cooperative projects to ensure the sustainability of the health of these systems.

Question 1a. Could resource managers not already use their existing funds for this purpose?

Answer. Perhaps, but the attention and funding is primarily directed at solving problems, not preventing problems with salmon populations. Existing problems always seem to take a funding priority, and direction from Congress that prevention of a problem is also a priority when Federal dollars are to be allocated is needed to assure existing habitat and populations are being protected.

Question 1b. If the potential economic payback of stronghold activities is so great, why have they not focused more resources on such projects?

Answer. We believe that outside Alaska, the damage to salmon populations was already set in place well before the initiation of the public consciousness of the value that salmon provide, and agency efforts to address situations of depletion. Harmful practices proceeded in many salmon bearing systems before the scientific knowledge existed to protect salmon while promoting resource and agricultural development and population expansion. We do not feel that the value of protecting salmon has truly been “a part of the equation” for most of the continuing history of the development of the United States. It is only recently that the term sustainability has been so prevalent in resource and development conversations and regulatory agency actions. The Salmon Stronghold Conservation Act would indeed have been more timely a few decades ago for most of the historical range of salmon in the U.S.

Question 2. New England also has its share of healthy stocks, such as Maine lobster and sea scallops, that each bring over \$300 million annually in landings value. The Gulf of Maine and Georges Bank could be considered strongholds for these critical species. Might this kind of stronghold partnership structure benefit marine species like lobster and scallops, as well as anadromous species like Pacific salmon?

Answer. Yes. Viable healthy populations of many varieties of seafood could benefit from proactive attention to ensure the economic viability of communities that depend on them—and most importantly, to ensure continued public benefit through sustainable seafood supply.

Question 3. In 2006, the Departments of Commerce and Interior joined forces with the Association of Fish and Wildlife Agencies to publish the National Fish Habitat Action Plan, a document that developed a strategy to protect, restore, and enhance the Nation’s fisheries ecosystems. This Action Plan established a Governing Board of up to 20 members from state and Federal agencies, the conservation and science communities, and industry representatives tasked with coordinating involvement and raising awareness of and funding for fish habitat considerations. How would the Stronghold Partnership differ from and coordinate with this Governing Board?

Answer. There are differences in the makeup of the governing bodies of the National Fish Habitat Action Plan Board from the Salmon Stronghold Partnership Board, though both share in common the representation of NMFS, USFWS, USFS, and the EPA. We reiterate our written comment that we would support increased representation of commercial fishing in the Strongholds Partnership Board.

The Fish Habitat Action Plan is nationwide in scope and its efforts are spread among a wide array of species, including many that do not include the public benefit of food production through sustainable commercial fisheries. It focuses on fish habitat conservation and restoration efforts specific to a particular watershed.

The Salmon Stronghold Partnership would narrow its focus to salmon only, while broadening its range to consider impacts and projects beyond habitat including water quality and quantity, climate change effects, hatchery opportunities and effects, and other potential opportunities to benefit salmon populations.

Question 4. Some principles of conservation biology would support the stronghold concept. However, finding examples of existing “stronghold” programs is difficult. How would you describe the defining characteristics of a species “stronghold”?

Answer. A stronghold is a watershed, area, region, or in the case of Alaska, a state that still retains healthy populations of salmon. These are places where the habitat and food webs of the freshwater streams and lakes are intact to provide the opportunity for salmon to return to suitable spawning habitat, water quality and quantity to provide for the incubation of eggs and the survival of juvenile salmon in their freshwater rearing habitats, passage to marine environment, marine food webs, and regulatory regimes that have enabled sustained populations to this time. Considering the original range of virtually every coastal watershed from Central California to Northern Alaska, these remaining places that support salmon populations are very special and deserving of the attention that will be provided by the Act.

Question 4a. What precedents exist for this type of management, and have stronghold management approaches resulted in measurable conservation gains for the target species?

Answer. We are not aware of direct comparison already in place. We see the strongholds concept as a practical application of ecosystem based management, which has become a very common slogan but is still in its infancy in actual application in resource management. The concept of the Salmon Strongholds Partnership Act is novel, and timely.

Question 4b. If the concept of a “stronghold” is based largely on where the species has a relatively large population and intact habitat (*i.e.*, mostly based on ecological criteria), how are human economic and social needs taken into account when selecting “stronghold” sites?

Answer. In Alaska, salmon represent the largest employment component of the multi-billion dollar seafood industry with the majority of harvester, crew, and processor opportunities. While the seafood industry is diversified among coastal and off-shore fisheries for a rich variety of species, salmon is still the lifeblood of Alaska’s coastal economies while also providing economic benefits to all Alaskans through revenues and reduced cost of transportation for virtually all goods consumed in the State, by the filling of containers that otherwise would return to U.S. ports empty. Salmon is also the majority of subsistence harvest for many Alaskans that live in areas that do not support a cash economy or traditional employment opportunities. Salmon are integral to our tourism economy not only through sport fishing but in wildlife viewing activities such as bear viewing which is focused at places where for centuries bears have congregated to feed on returning salmon. In addition, Alaska’s forests are dependent on nutrients that are moved onto land as bears feed. The loss of salmon in areas of Alaska would be a huge detriment in human economic and social terms.

In summary, in Alaska salmon and human economic and social needs are inseparable.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. MARIA CANTWELL TO
MS. SARA LABORDE

Question 1. In these hard economic times, there have been questions about allocating additional funds to protect healthy salmon populations when funds are already provided for recovering struggling ones. Don’t these stronghold efforts need to be *in addition* to current efforts to recover salmon stocks?

Answer. Yes, additional funds are needed to support efforts to protect healthy populations and reduce the likelihood of additional populations being listed under the Endangered Species Act (ESA).

The Pacific Coastal Salmon Recovery Funds (PCSRF) are vital to meeting the recovery efforts called for in salmon recovery plans developed for ESA-listed salmon populations.

The PCSRF program is a very deliberate program with high standards and accountability. It is directed toward the Federal mandate to recover salmon and steelhead populations listed as threatened or endangered under the Endangered Species Act (ESA). The allocation of funds is driven by priorities developed by local watersheds to address actions outlined in NOAA-adopted salmon and steelhead re-

covery plans. For example, Pacific Coastal Salmon Recovery Funding (PCSRF) in WA, OR, ID, and CA is primarily allocated to projects that further protection and restoration of ESA-listed salmon and steelhead populations.

As a consequence, basins with healthy wild salmon populations do not receive adequate funding for protection and restoration actions needed to ensure the populations remain in good shape (*e.g.*, Smith River in CA; Olympic Peninsula rivers along WA's Pacific coast).

It should be noted, that there is great economic benefit derived from the healthy salmon stronghold populations that are at risk when population crashes occur such as recent crashes in the Frazier and Sacramento salmon populations.

Recovery efforts are vital, but are extremely costly and will take time. The Stronghold Act calls for recovery efforts to be complemented by strategic investments in salmon strongholds to secure genetically diverse source populations. This will be critical to ensure healthy wild salmon populations continue to thrive in light of climate change and other threats.

It will also protect the valuable ecological services these watersheds provide (*e.g.*, drinking water, irrigation, flood control, nutrient cycling, carbon sequestration, and pollutant filtering).

Question 2. Can you explain how preserving the stronghold populations will assist in decreasing recovery costs in the future?

Answer. Investing in salmon strongholds will save billions of dollars in the long run by preventing future ESA listings and related restoration costs. It is much more cost effective to work with local and regional communities and partners to protect functioning systems now—than to pay the high costs we have found it takes to repair and restore systems after they have been significantly impacted.

Correcting historic actions, after the fact, is proving to be expensive: reforming economically important hatcheries, setting back protection levies, improving water withdrawal systems, providing passage to quality habitats upstream of barriers to migration are just a few examples.

If the objective is to have sustainable salmon and steelhead populations—that are able to respond to changes in their watersheds—it is vital to support and protect healthy ecosystem functions and the local communities that depend on them.

By creating a partnership with local communities, Federal and state managers, tribes and private organizations, we can provide the support needed to ensure a watershed continues to provide the important functions needed for salmon to survive—clean water, spawning and rearing habitat, and reduced competition with hatchery fish on the spawning grounds.

Question 3. As a state wildlife manager, what tools would the Pacific Salmon Stronghold Conservation Act give you that you currently don't have?

Answer. Washington's Fish and Wildlife Commission recently adopted a fishery and hatchery reform policy that addresses needed hatchery and harvest reform issues for both listed and non-listed salmon and steelhead populations.

As a state manager we are currently addressing harvest issues both locally with tribal co-managers and regionally through the Pacific Salmon Commission and Pacific Salmon Treaty. We are addressing hatchery reform issues, watershed by watershed, using the thoughtful recommendations and guidelines of the Congressionally-created Hatchery Scientific Review Group. Hatchery reform strategies are looked at from a watershed and a larger regional context.

While there are vehicles to address harvest and hatchery issues at a broader scale, the Stronghold Act provides the framework to address other important factors affecting salmon at a broader regional scale as well.

The Salmon Stronghold Act provides the following important tools:

- Provides policy leadership to consider ways to ensure healthy systems remain healthy and functioning.
- Enables local communities, organizations, and state, Federal and tribal managers to work at a regional level: from California to Alaska to address large programmatic issues that can benefit all salmon populations.
- It creates a policy table that can address issues at local, state and Federal levels. The Stronghold Steering Committee includes every state fish and wildlife agency, Governor's office and Federal natural resource agency. This is extremely valuable to local governments or state managers frustrated when bureaucratic processes or various agency silos impede development or implementation of effective local solutions.
- It builds on local and state funding and accountability systems keeping the system efficient, effective and accountable.

Question 4. Do you believe the structure and makeup of the Salmon Stronghold Partnership will be valuable for Washington State in providing a forum to discuss salmon conservation across political boundaries?

Answer. Yes.

First, the Salmon Stronghold Partnership builds on local and state funding and accountability systems that reinforce program efficiency, effectiveness and accountability.

In Washington State, we have worked hard at the watershed level through salmon recovery regions to develop a coordinated and integrated approach to salmon recovery and have attempted to use this framework in areas with healthy un-listed populations of salmon and steelhead.

The State of Washington created and continues to support a locally-driven approach to salmon restoration and protection. The annual habitat project lists developed in every watershed are based on a locally-driven approach. Salmon habitat restoration projects are developed and prioritized through the local "Lead Entity" groups. These groups, when initiated, could only be constituted if local governments were official members. This approach has provided a local ownership of habitat restoration actions and priorities. The state believes in and supports this process and continually looks for ways to strengthen it. This is a "bottoms-up" program directed by local governments and their local tribal, state and Federal partners with technical, policy, and fiscal oversight by the state (*i.e.*, the Salmon Recovery Funding Board and Recreation and Conservation Office).

The Stronghold Partnership will assist the development of these systems in areas with still healthy populations. It will help create a steering committee at the local level as well as connect to a much broader regional system that can address issues in a watershed as well as issues much larger in scale.

Question 5. How do you think this bill would help achieve effective salmon management in watersheds with fragmented land ownership like the Wenatchee Basin?

Answer. The Pacific Salmon Stronghold Conservation Act would help achieve effective salmon management in basins with fragmented ownership—like the Wenatchee Basin—by providing the funds necessary to initiate and complete land consolidation through voluntary land exchanges and acquisitions. Land consolidation across key salmon habitats will increase both the effectiveness and efficiency of the implementation of watershed conservation plans.

Because salmon utilize most of the aquatic habitats in a watershed ranging from the high gradient tributaries in the upper watershed through the wetland habitats in the lower gradient portions, holistic watershed level planning is essential for effective lands management. Consequently, numerous partnerships have emerged over the last couple of decades that focus on developing watershed plans to coordinate and leverage the conservation strategies of multiple landowners across a variety of land uses.

While these plans are effective in developing scientifically-driven strategies to conserve salmonid resources, their implementation is often compromised by the divergent land use goals of private, local, state, and Federal land owners. Where ownership is fragmented within a watershed, the conservation challenges created by conflicting landowner goals are greatly amplified. Conflicting goals can lead to inconsistent management of contiguous habitats, which eliminates conservation opportunities or diminishes the effectiveness of ongoing conservation investments. For example, the protection and restoration of upper watershed tributary habitats will be ineffective if they are, or later become, inaccessible due to fish passage barriers downstream. Similarly, the eradication of invasive species by one landowner will not work if the species are not eradicated, or are reintroduced, by neighboring landowners.

In the Wenatchee Basin, the patchwork ownership pattern and the inefficiencies it promotes present challenges for both private landowners—who struggle with invasive species control, inefficient fire management, and trespass—and the conservation community, which must contend with spatially inconsistent implementation of conservation plans. Despite broad recognition of the inefficiencies created by fragmented land use, no state or Federal agency has made land consolidation a priority in the basin due in large part to the technical complexity of the task, the level of coordination needed, and a lack of funds available to support management of the process. Other salmon stronghold basins, like the John Day Basin in Oregon, have also identified fragmented land ownership as a limiting factor to their capacity to conserve wild salmon.

Because it supports cross-cutting, programmatic initiatives that affect multiple strongholds, the Pacific Salmon Stronghold Conservation Act has the unique capacity to jumpstart locally-led efforts to implement land consolidation, which have been difficult to finance through existing programs. This Act would help eliminate signifi-

cant inefficiencies resulting from fragmented ownership by providing opportunities to protect and restore key habitats that are now inaccessible, elevating this issue as a priority amongst Federal agencies, and providing funding and technical assistance to local partners to work with Federal, state and tribal governments and local landowners to facilitate consolidation. In doing so, this Act would not only address a key limitation to the long term health of salmon strongholds, but also promote efficiencies in many of the West's working landscapes.

Question 6. Some may have a concern that once this bill is enacted and implemented, the Pacific Salmon Stronghold Partnership will become just another layer in an already vast bureaucracy of salmon management? Are there steps for implementing this bill that you view as essential to make sure that we truly realize the added value we're trying to achieve by creating the Partnership?

Answer. It is important that the Stronghold Partnership continue to be a voluntary, incentive-based effort that will leverage resources to accomplish locally-supported goals shared by public and private sectors in salmon strongholds.

It is also critical that the Stronghold partners provide a science-based list of high conservation value actions within strongholds—that are supported by local communities, who themselves have “opted in” to the Stronghold Partnership. This will ensure that the actions provide good investment opportunities for interested donors/partners.

A third component of the Stronghold Partnership is the call for utilizing a broad suite of voluntary, market-based approaches, such as conservation easements, resource banking, and third-party certification that is already being utilized by public and private entities throughout the country.

It is also important that the Stronghold Partnership continue to utilize current state systems for prioritizing and funding watershed projects.

Lastly, a key is the required participation from applicable Federal, state and local agencies and organizations to assist in development of locally based strategies to ensure healthy salmon populations.

Question 7. Jurisdiction over salmon habitat crosses many Federal, tribal, state, and local boundaries. We need to avoid adding levels of bureaucracy and focus on making sure that goals and efforts among these institutions are well aligned. Having been part of these efforts in the past, do you believe that this Act promotes efficiency among these different entities?

Answer. Yes.

The Stronghold Act reinforces the use of locally and state developed prioritization, funding and accountability processes. We are also aided by the lessons learned through developing and implementing the salmon recovery plans. The Stronghold Partnership builds upon these lessons, processes and partnerships and provides the support for local communities to protect their stronghold populations.

There are numerous important Federal and state agency programs that can benefit salmon and watersheds in agencies like U.S. Forest Service, U.S. Fish and Wildlife Service, Washington Department of Fish and Wildlife and Washington Department of Ecology.

One of the objectives of the Stronghold Partnership is to work with the state and Federal partners in identifying and aligning these valuable programs to better meet local priorities for keeping the local watershed healthy for salmon and healthy for local communities. This is applicable to different aspects of state and Federal programs—even those not focused specifically on providing funds to watersheds—that still play an important role in ensuring stronghold watersheds continue to be significant contributors of salmon. U.S. Forest Service Roads maintenance program is one example.

The Stronghold Partnership will utilize the current funding distribution structure in the State of Washington that coordinates the identification, review and selection of projects to make the most effective use of both the PCSRF funds and Salmon Stronghold funds. In that PCSRF funds are focused on ESA populations as a priority, Partnership activities will focus on meeting stronghold watershed needs through partnerships with private funders as well as more effective coordination of state and Federal activities in the watershed.

Question 8. This bill affords opportunities for communities to become even more of a part of conservation of salmon populations. One of these opportunities is conserving habitat by providing ecosystem services. How do you see this opportunity expanding stewardship in communities that have healthy salmon populations?

Answer. Voluntary payment for ecosystem services is one potential tool in addressing salmon conservation that enables local communities to work together to identify and provide effective stewardship of their watersheds and salmon populations.

If in looking at the priority actions identified for the stronghold watershed, payment for ecosystems services is identified as a potential strategy, the local partner would look at the ecological goals determined by scientific analysis in the watershed (*i.e.*—ecosystem services per acre of land) and would inventory all existing incentive-based programs available to landowners and land managers in key areas.

If gaps exist, the Stronghold Partnership would seek to fill this gap by leveraging private funds through species banks or other mechanisms.

For example, if ensuring functioning riparian corridors was a key local priority, riparian farmers might already be currently benefiting from a program to maintain stream vegetation buffers but private forest landowners might not be. The partnership might assess opportunities to recruit private capital to offer the same opportunity to private forest owners adjacent to rivers. Many private firms will consider voluntary contributions of this nature if the environmental and social benefits are clearly identified and are measurable.

Question 9. What other opportunities for community involvement are provided for or emphasized that you see as beneficial for the success of the salmon stronghold strategy?

Answer. The Salmon Stronghold Act will provide a high-level forum to provide this unifying framework where key public and private agencies and organizations can coordinate to improve ecosystem function through implementation of high value conservation actions within strongholds.

Our goal is to improve policies affecting strong salmon populations, improving ecosystem functions. It will further our ability, at the state level, to transition to ecosystem management, as public and private resources are delivered as efficiently as possible directly to local entities implementing protection and restoration actions that are ecosystem based.

Question 10. The stronghold approach focuses efforts and funding on healthy populations, rather than focusing, as has been done in the past, on recovering struggling populations. You mentioned the importance of focusing our conservation efforts on the healthiest wild salmon ecosystems. Is it accurate to state that a stronghold approach is, ultimately, a piece of the larger conservation puzzle?

The stronghold approach is the critical—missing—piece of the larger conservation puzzle. As climate change occurs, ecosystems will adjust to these changes. Systems that are healthy and resilient will be best able to adapt to these changes. The most effective strategy for preparing for the future is to protect our healthy, functioning systems.

Whether these changes can be absolutely predicted or not, we know that ecosystems and populations with an innate ability to adapt have a better chance of dealing with changes that might occur.

By implementing a stronghold approach—we are strategically ensuring that the listed pieces of the puzzle don't continue to just get larger.

Question 11. Why is this strategy an effective approach for rehabilitating the integrity of evolutionarily significant units?

Answer. In the briefest terms, it will be impossible to rehabilitate listed ESUs if: (a) the strongest populations within the ESU deteriorate before restoration actions elsewhere in the ESU take effect or (b) if wild salmon near the listed ESU decline to the point where they can no longer provide seed stock to repopulate the listed populations, either via natural migration or hatchery intervention.

At present, roughly one half of the Evolutionarily Significant Units (ESUs) of Pacific salmon—distributed across Washington, Oregon, California, and Idaho—are listed as threatened or endangered under the Federal Endangered Species Act.

These ESUs are quite literally adrift on a sea of peril, threats to population viability that reflect the trajectories of human population growth, society's relentless need to utilize resources of land and water that the salmon depend on, the risks associated with fish hatcheries and harvest, and now, global climate change.

Current efforts to rehabilitate these ESA listed ESUs will require time to bear fruit. Among current and future threats the salmon face, alteration of historical habitat conditions, coupled with local expressions of global climate change, are the most serious, and the most difficult to remediate. Restoring watersheds to salmon-suitable conditions will require decades. Aside from removing passage barriers like culverts, there are no quick fixes to restoring watershed functions required to sustain viable salmon ESUs.

Salmon stronghold populations provide an anchor, metaphorically, to secure the ESU from further deterioration; strongholds also offer the core of adaptive genetic diversity essential to restoring the viability of populations across the listed ESU.

What strength remains within listed ESUs is the strength in what we refer to as "strong populations" or "salmon strongholds" within or near the listed ESUs.

These remaining centers of abundance, productivity, and diversity are the heart of our current ability to fish and to our hopes for recovering the listed ESUs to viability.

In short, if one is aboard a ship at sea (an ESU), with fire (weak populations) distributed from stem to stern, it is crucial to secure strategically dispersed bases of operation (strongholds) from which one may send fire-crews forth to secure the ship. A single-minded focus to extinguish the flames (rehabilitate the weakest populations), without securing strategic operation bases (strongholds) is likely to result in failure.

Question 12. The Pacific Salmon Stronghold Conservation Act would utilize payments for ecosystem services as part of its comprehensive approach to Pacific salmon conservation. What are the benefits of payments for ecosystem services, and can you provide some examples of how they work?

Answer. Payments for ecosystem services expand the tools available to local communities in keeping their ecosystems functioning AND their working lands working.

Voluntary payment for ecosystem services is one potential tool in addressing salmon conservation. If in looking at the priority actions identified for the stronghold watershed, payment for ecosystems services is identified as a potential strategy, the local partner would look at the ecological goals determined by scientific analysis in the watershed (*i.e.*—ecosystem services per acre of land) and would inventory all existing incentive-based programs available to landowners and land managers in key areas.

If gaps exist, the Stronghold Partnership would seek to fill this gap by leveraging private funds through species banks or other mechanisms. For example, if ensuring functioning riparian corridors was a key local priority, riparian farmers might already be currently benefiting from a program to maintain stream vegetation buffers but private forest landowners might not be.

The partnership might assess opportunities to recruit private capital to offer the same opportunity to private forest owners adjacent to rivers. Many private firms will consider voluntary contributions of this nature if the environmental and social benefits are clearly identified and are measurable.

For example, Oregon recently enacted an Ecosystems Services Act (state statute), creating a state framework for accounting and coordination of ecosystem service markets in the state. The Oregon Department of Transportation operates a “species bank,” allowing for mitigation actions that produce the highest benefit for species or habitats.

Existing ecosystem service initiatives enjoy the full support and participation of state authorities. The EPA-supported Willamette Partnership in Oregon has robust participation from state agencies and departments. Ecosystem service pilots in King County Washington are supported by the state, and California officially supports several ecosystem service pilots, including a voluntary “species banking” registry. This approach enjoys broad support from a wide range of stakeholders, including farmers, ranchers, regulated entities, conservation organizations, EPA, USDA and others.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. OLYMPIA J. SNOWE TO
MS. SARA LABORDE

Question 1. The National Marine Fisheries Service (NMFS) has dedicated significant resources to Pacific salmon conservation and management—upwards of \$117 million in 2010 alone for the Pacific Coastal Salmon Recovery Fund (PCSRF) and other “salmon management activities.” NMFS also receives funding from two international funds with an endowment of approximately \$135 million through the U.S./Canadian Pacific Salmon Commission. S. 817 would authorize an additional \$30 million annually to establish a grant program that would focus on maintaining currently healthy habitat for Pacific salmon. What authorities does the legislation bring to fisheries habitat conservation that does not already exist?

Answer. The Pacific Salmon Stronghold Conservation Act provides congressional direction to focus Federal resources on preventative, proactive efforts to conserve healthy wild Pacific salmon ecosystems through the establishment of a Salmon Stronghold Partnership program and the Salmon Stronghold Partnership. By directing the National Oceanic and Atmospheric Administration (NOAA) to establish a salmon stronghold watershed grants and technical assistance program, this Act provides clear statutory funding direction to focus resources on the conservation of healthy wild salmon populations and their habitat as a complement to ongoing salmon recovery efforts. This legislation also authorizes Federal participation in the Salmon Stronghold Partnership and requires Federal agencies responsible for ac-

quiring, managing, or disposing of Federal lands within salmon strongholds to cooperate with NOAA to conserve salmon strongholds. None of these authorities currently exists.

Though NOAA uses an assortment of authorities when it administers grants today—from the Endangered Species Act and the Marine Mammal Protection Act to the Pacific Salmon Treaty—these authorities provide almost no specific congressional direction to the agency, and are primarily focused on the recovery of threatened and endangered salmon stocks. Further, while NOAA receives significant congressional direction in its appropriations bills, including specifics on how to spend grant funds, the agency has acknowledged that, in part because there is no organic act establishing the agency, it has no statutory funding direction. As a result, NOAA determines the guidelines and details of most salmon grants (*i.e.*, what purpose, how much, who gets it, matching funds, who partners) on its own, and allocates the majority of its salmon funding toward recovery and restoration efforts.

This is illustrated through the existing funding sources mentioned above. NOAA dedicates significant funding to support Pacific salmon conservation and management activities, primarily through the Pacific Coastal Salmon Recovery Fund (PCSRF), Salmon Management Activities related to the implementation of the Pacific Salmon Treaty, and Pacific Salmon Commission Restoration and Enhancement funds. Unfortunately, none of these funding sources supports prevention-based strategies to conserve strong wild salmon populations before they decline or healthy salmon-bearing watersheds before they are degraded. Further, they fail to support innovative strategies to address threats to healthy wild salmon populations that transcend watershed and state boundaries.

For example, the Pacific Coastal Salmon Recovery Fund supports projects necessary for the conservation of salmon and steelhead populations that are listed as threatened or endangered under the Endangered Species Act (ESA), or identified by a state as at-risk or to be so-listed; for maintaining populations necessary for exercise of tribal treaty fishing rights or native subsistence fishing; or for conservation of Pacific coastal salmon and steelhead habitat. In Washington, Oregon, Idaho, and California, PCSRF funding is largely directed toward the Federal mandate to recover ESA-listed salmon and steelhead populations, and allocated based on priorities identified in salmon and steelhead recovery plans. In Alaska, which currently has no ESA-listed salmon populations, PCSRF funding is limited to habitat conservation efforts. As such, it cannot be used to proactively tackle other factors that may pose serious threats to salmon populations like climate change, development, and non-native species proliferation, all of which the Pacific Salmon Stronghold Conservation Act seeks to address through innovative, prevention-based strategies.

Similarly, Pacific Salmon Commission Restoration and Enhancement funds (“Northern and Southern funds”) are primarily directed toward the enhancement of wild stock production and the development of improved information for resource management, rather than proactive strategies to conserve healthy wild salmon populations. The Pacific Salmon Commission has identified three primary goals for the Northern and Southern Boundary funds: (1) development of improved information for resource management, including better stock assessment, data acquisition and improved scientific understanding of limiting factors affecting salmon production in the freshwater and marine environments; (2) rehabilitation and restoration of marine and freshwater fish habitat, and improvement of habitat to enhance productivity and protection of Pacific salmon; and (3) enhancement of wild stock production through low technology techniques rather than through large facilities with high operating costs. Over the last few years, the majority of the Northern and Southern funds have been spent on Goals 1 and 3, with only a small percentage allocated toward habitat restoration and rehabilitation. In addition, according to the Northern Fund Committee’s 2009 Call for Proposals, “[T]he Committee believes that large-scale habitat rehabilitation, habitat monitoring, habitat protection, and land acquisition are more appropriately addressed by other agencies and organizations.”

By establishing a Salmon Stronghold Partnership program, this legislation will complement existing salmon funding sources and enable resource managers to get ahead of the curve in conserving wild salmon over the long term. In addition, this Act will enhance cooperation and coordination among Federal resource agencies and other stakeholders in implementing prevention-based strategies to conserve salmon strongholds across diverse land ownerships and jurisdictional boundaries.

Question 1a. Could resource managers not already use their existing funds for this purpose?

Answer. Though NOAA can currently undertake projects to conserve healthy wild salmon populations and their habitat, the agency rarely does so because it has no such mandate (see answer to question (1) above). That is why the Pacific Salmon Stronghold Conservation Act is so vital—it requires NOAA to undertake a com-

plementary approach to its current recovery focus by protecting and restoring healthy wild Pacific salmon ecosystems.

In addition, current salmon funding programs are not built to address Pacific salmon conservation goals on a regional scale. For example, PCSRF funds are allocated on a state by state basis. Each state allocates funds to recovery basins for habitat protection and restoration actions, and priorities are determined by each recovery basin (*e.g.*, Lead Entities in WA). While these efforts are critical, resource managers must also assess emerging threats that transcend watershed and state boundaries. These cross-cutting threats—like invasive species proliferation and climate change—have great potential to exacerbate the impacts of existing limiting factors, while creating new ones. Unlike basin-specific limiting factors, however, which often require “on-the-ground” solutions implemented at the watershed scale, these threats can be more effectively addressed through “programmatic” remedies that operate across multiple strongholds. This Act will enable the Salmon Stronghold Partnership to develop and support these cross-cutting, programmatic remedies.

Question 1b. If the potential economic payback of stronghold activities is so great, why have they not focused more resources on such projects?

Answer. This is partially due to the dire state of many Pacific salmon populations across the West Coast. As I mentioned in my testimony, salmon are now extinct over 40 percent of their native range, and many other salmon populations have declined to the point that they are protected under the Endangered Species Act. As a result, Federal agencies are spending the majority of their resources responding to the crisis of the day (like the Sacramento Chinook collapse) and restoring highly impacted systems.

In addition, the failure to allocate resources to proactive conservation efforts is likely because the payback from those efforts is harder to account for. It is much easier to track the return of an investment in restoration, where miles restored or fish passage barriers removed are easily quantified, than it is to evaluate preventative measures that are targeted to maintaining healthy ecosystem functions. This is a paradox for two important reasons: (1) it is less expensive to conserve healthy wild salmon populations and intact watersheds than it is to rebuild imperiled stocks or restore degraded habitat; and (2) the desired outcome—a functioning ecosystem supporting healthy wild salmon populations—is far more likely to be secured through prevention-based strategies than through restoration approaches.

If we do not implement a new policy to focus Federal resources on the conservation of healthy wild salmon ecosystems in the near term, we will continue to see the health of our wild salmon populations decline and may lose our opportunity to stem the tide of wild salmon population loss and extinction.

Question 2. In 2006, the Departments of Commerce and Interior joined forces with the Association of Fish and Wildlife Agencies to publish the National Fish Habitat Action Plan, a document that developed a strategy to protect, restore, and enhance the Nation’s fisheries ecosystems. This Action Plan established a Governing Board of up to 20 members from state and Federal agencies, the conservation and science communities, and industry representatives tasked with coordinating involvement and raising awareness of and funding for fish habitat considerations. How would the Stronghold Partnership differ from and coordinate with this Governing Board?

Answer. The Salmon Stronghold Partnership Board differs from the National Fish Habitat Board in a number of ways, most notably in its membership, purpose, and scale of focus.

The Salmon Stronghold Partnership is a public-private partnership among Federal, state, tribal, and local governments, private landowners, and nongovernmental organizations working across political boundaries, government jurisdictions, and land ownerships to identify and conserve the healthiest wild Pacific salmon ecosystems in Alaska, Washington, Oregon, Idaho, and California.

The Salmon Stronghold Partnership Board is the executive body of the Salmon Stronghold Partnership. The Board will consist of 19 to 21 representatives with strong scientific or technical credentials and expertise, as follows: one representative from each of the National Marine Fisheries Service (NMFS), the U.S. Fish and Wildlife Service (FWS), the Forest Service, the Environmental Protection Agency, the Bonneville Power Administration, the Bureau of Land Management, and the Northwest Power and Conservation Council; one representative from each of the States of Alaska, California, Idaho, Oregon, and Washington; not less than three and not more than five representatives from Indian tribes or tribal commissions located within the range of Pacific salmon; one representative from each of three nongovernmental organizations with salmon conservation and management expertise; one national or regional representative from an association of counties; and rep-

representatives of any other entities with significant resources regionally dedicated to the protection of salmon ecosystems that the Board determines are appropriate. The Pacific Fisheries Resource Conservation Council, an independent advisory body to the Canadian Minister of Fisheries and Oceans and the British Columbia Minister of Fisheries, is also participating on the Board as an Ex Officio member.

The primary purposes of the Board will be to: (1) develop and support strategies focusing on the conservation actions projected to have the greatest positive impacts on wild salmon abundance, productivity and/or diversity in and across salmon strongholds, and (2) provide criteria for the prioritization of projects funded under the Salmon Stronghold Partnership program. In developing proactive strategies to prevent the decline of healthy wild salmon ecosystems and criteria for the prioritization of projects, the Board will not limit its scope to habitat conservation. Instead, it will consider all of the factors affecting the health of salmon strongholds (e.g., harvest, hatchery influence, and habitat alteration) at both watershed and region-wide scales.

In contrast, the National Fish Habitat Board focuses on fish habitat conservation—both healthy habitats and those that are degraded—at a nationwide scale in an effort to establish national goals and priorities, designate Partnerships, and review and make recommendations regarding fish habitat conservation projects. The Board will be composed of 27 members, including: the Director of the FWS; the Assistant Administrator of the NMFS; the Chief of the Natural Resources Conservation Service; the Chief of the Forest Service; the Assistant Administrator for Water of the Environmental Protection Agency; the President of the Association of Fish and Wildlife Agencies; the Secretary of the Board of Directors of the National Fish and Wildlife Foundation; four representatives of State agencies, one of whom shall be nominated by a regional association of fish and wildlife agencies from each of the Northeast, Southeast, Midwest, and Western regions of the United States; one representative of the American Fisheries Society; two representatives of Indian tribes, of whom one shall represent Indian tribes from the State of Alaska, and one shall represent Indian tribes from the other states; one representative of the Regional Fishery Management Councils; one representative of the Marine Fisheries Commissions; one representative of the Sportfishing and Boating Partnership Council; and ten representatives selected from each of the following groups: the recreational sportfishing industry, the commercial fishing industry, marine recreational anglers, freshwater recreational anglers, terrestrial resource conservation organizations, aquatic resource conservation organizations, the livestock and poultry production industry, the land development industry, the row crop industry, and natural resource commodity interests, such as petroleum or mineral extraction.

The National Fish Habitat Board and Salmon Stronghold Partnership Board have three representatives from the same Federal agencies—NMFS, FWS, and the Forest Service—and two representatives from the same non-governmental organizations (NGO's)—Trout Unlimited and The Nature Conservancy. Aside from these five members, and potentially one state representative (depending on the Western State appointment to the National Fish Habitat Board), membership is quite different among these two bodies. Both the Federal agencies and the NGO's participating on the Boards recognize the differences between these two efforts and the value of supporting both.

The Salmon Stronghold Partnership Board will coordinate with Fish Habitat Partnerships (FHPs) that overlap with its focal area (*i.e.*, salmon strongholds across Alaska, Washington, Oregon, Idaho, and California) to avoid duplication of efforts and potentially fill the gaps that Fish Habitat Partnerships do not address, either geographically or through programmatic initiatives that address challenges across multiple basins. This cooperation and coordination will be necessary in Alaska, since the state has been identified as a regional salmon stronghold and contains three recognized FHPs. Members of the Salmon Stronghold Partnership Board will initiate discussions with the Alaska FHPs at a National Fish Habitat meeting in Anchorage this summer to determine how the partnerships can work together in the State.

Question 3. Some principles of conservation biology would support the stronghold concept. However, finding examples of existing “stronghold” programs is difficult. How would you describe the defining characteristics of a species “stronghold”?

Answer. The Pacific Salmon Stronghold Conservation Act defines a “salmon stronghold” as “all or part of a watershed that meets biological criteria for abundance, productivity, diversity (life history and run timing), habitat quality, or other biological attributes important to sustaining viable populations of salmon throughout their range.” S. 817, 111th Cong. § 3(8) (2009). Because the stronghold approach seeks to sustain viable populations “across their range,” and abundance and diversity decrease dramatically from strongholds in the north to those in the south, the term “stronghold” is relative. Each stronghold is identified and can only be de-

scribed within the context of the distinct geographic areas that conservation planners use to organize the enormous landscape that supports wild salmon. These areas are known as ecological regions, or “eco-regions.” Within the eco-regions of CA, OR, WA, and ID (and southern British Columbia), partners are convening to evaluate wild populations and identify “core strongholds.” Because of the extraordinary abundance and diversity of wild salmon populations throughout Alaska, the Act recognizes the entire state as a salmon stronghold. Despite the variations across eco-regions in the lower 48 states, some common characteristics exist, which may be summarized as follows:

1. *Strongholds meet the highest values for wild salmon abundance and diversity.*

Salmon strongholds support the greatest assemblage of wild salmon species with high abundance and productivity and minimal influence of hatchery-reared populations within an eco-region. Wild populations demonstrate a high diversity of life history strategies, providing a significant buffer against population extirpation in the event of a short or long term disturbance to the system. The first step in identifying salmon strongholds is for experts within each eco-region to score populations according to three criteria: abundance and productivity, percent natural origin spawners, and life history diversity.

2. *Strongholds make the highest proportional contributions toward meeting conservation goals within an eco-region.* In his testimony on the Pacific Salmon Stronghold Conservation Act, Dr. Gordon Reeves with the U.S. Forest Service stated, “[T]he identification and selection of a stronghold is premised on principles of systematic conservation design, which are well established in the scientific literature (see Soulé and Terborgh 1999). These include: (1) comprehensiveness—the extent to which the network protects the desired level of biodiversity and abundance; (2) irreplaceability—the inclusion of areas or populations that are necessary to achieve the conservation goals; and (3) efficiency—the network is designed “[in] the most efficient manner that achieves the conservation goals while minimizing the area involved.” By entering stronghold data collected through “expert scoring” (#1 above) into network design software, conservation planners can identify those locations that support the highest proportions of an eco-region’s overall wild salmon production within a small area (relative to the entire eco-region). Investment in those locations—salmon strongholds—will yield the biggest bang for our buck in conservation returns.

3. *Strongholds contain relatively unfragmented and ecologically intact habitats.* Scientists have conducted extensive research that clearly demonstrates the adverse impacts of aquatic and terrestrial habitat fragmentation and degradation on the abundance and diversity of wild salmon populations. Salmon strongholds contain high value and intact riparian, instream, wetland, and (sometimes) estuarine habitats that are well connected across the watershed. Trophic systems (the foodweb) are intact, invasive species infiltration minimal, and key areas of refugia are relatively unaltered. In short, the salmon stronghold system is functioning with minimal human disturbance relative to the other parts of the eco-region.

Question 3a. What precedents exist for this type of management, and have stronghold management approaches resulted in measurable conservation gains for the target species?

Answer. A key purpose of conservation biology is “to retain the actors in the evolutionary play and the ecological stage on which it is performed” (quote of G.E. Hutchinson in Meffe and Carroll 1999). The establishment of strongholds, also known as reserves, is a primary tool for meeting this goal and has been employed around the world to help protect a vast number of organisms and resources (Margules and Pressey 2000). Generally, these are areas that currently have strong populations and intact, functioning ecosystems because conservation actions are most successful before populations or ecosystems begin to decline. Strongholds have been established primarily for marine and terrestrial systems. The stronghold network proposed by the current legislation would be one of the first for freshwater fish.

While many strongholds and stronghold networks have been established, it is difficult to fully assess their success (Gaston *et al.*, 2006). The reasons for this include the: (1) paucity of systematic data; and (2) incompatibility of data that has been collected to measure the performance of the individual efforts. However, studies that have evaluated strongholds and stronghold networks found that them to be generally successful in meeting their conservation objectives.

For example, the North American Flyway, which is a series of reserves on public and private lands along the migratory corridors of waterfowl that were established by the Migratory Bird Treaty Act, has helped to maintain healthy waterfowl popu-

lations (Nichols *et al.*, 1995). Similarly, Halpern (2003) reviewed the biological response to the establishment of 89 marine reserves worldwide and found that the density of fish was 2 times greater, biomass was 3 times greater, and size and diversity were 20–30 percent higher in reserves than in adjacent areas. The effects of the reserves increased with the size. Rates of declines of biodiversity in English reserves were generally lower than or similar to declines to outside areas (Gaston *et al.*, 2006). In addition, trends were most positive in larger protected areas. For example, Andam *et al.*, (2008) estimated that forest reserves in Costa Rica reduced deforestation by 10 percent.

Scientists have suggested the stronghold (or similar) approach for several years. Williams *et al.*, (1989) and Moyle and Yoshiyama (1994) were among the earliest to argue for this approach. Williams *et al.*, noted that no freshwater fish that was listed under the Endangered Species Act (ESA) up to that time had been removed because it recovered sufficiently. The number of freshwater fish listed under the ESA continues to increase, while few have been delisted to date (Williams and Miller 2006).

As Pacific salmon, and other native fish, in the western United States continue to decline, scientists are renewing the call for the protection of areas with the strongest and most diverse populations and most intact ecosystems (Williams and Miller 2006, Williams *et al.*, 2006, Gustafson *et al.*, 2007). Unfortunately, I am not aware of any example of where the stronghold approach has actually been applied for salmon or any other freshwater fish, particularly on a large spatial scale. Perhaps the best examples are the key watersheds, which are part of the Aquatic Conservation Strategy of the Northwest Forest Plan (NWFP) that guides management on Federal lands in western Oregon and Washington and northern California, within the range of the northern spotted owl (*Strix occidentalis caurina*). Key watersheds had currently good habitat, the best potential to respond to restoration, or were municipal water supplies, and were distributed across the area of the Northwest Forest Plan (Reeves *et al.*, 2006). The purpose of the former two types was to aid in the recovery of habitat of listed Pacific salmon and other fish. Ten years after the implementation of the NWFP, the proportion of key watersheds (70 percent) whose condition improved was greater than that of non-key watersheds (50 percent). This was achieved while allowing timber production and other activities to occur.

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Question 3b. If the concept of a “stronghold” is based largely on where the species has a relatively large population and intact habitat (*i.e.*, mostly based on ecological criteria), how are human economic and social needs taken into account when selecting “stronghold” sites?

Answer. The identification of salmon stronghold sites is based entirely on biological criteria, which includes abundance and productivity, “wildness” (influence of hatchery-born fish), and diversity of wild Pacific salmon and steelhead populations. Reliance on biological criteria in the determination of stronghold boundaries ensures that the effort to conserve strong populations is built on a foundation of solid science that accurately reflects population health and viability. This science-driven approach is essential if we are to accurately identify strongholds and carry out the intent of the Pacific Salmon Stronghold Conservation Act.

While a portfolio of watersheds is conferred stronghold status based on science, economic and social needs will be taken into account when decisions are made concerning where funds provided under this Act are invested. The Stronghold Partnership’s Charter states that the Salmon Stronghold Partnership Board will consider the extent to which a project will “protect, improve, or promote local economic opportunities associated with healthy salmon stronghold habitats and/or populations, including responsible and sustainable resource use related to fishing and recreation” when the Board determines annual priorities for funding. NASSP Charter, Section 5.2.5. By evaluating the potential of a project to deliver economic benefits to stronghold communities, the Board will consider not only the health of wild salmon populations, but also the communities and economies that they help sustain.

The Board’s intent to consider economic and social needs in its determination of funding priorities can also be illustrated through the “Rudio Creek” project, which the Partnership helped fund in 2008. Undertaken through a broad partnership, the Rudio Creek project supported a rancher’s efforts in the John Day basin to increase the efficiency of his irrigation practices while promoting the health of strong salmon and steelhead populations. The major objectives of the project were to keep water in a critical spawning and rearing tributary, Rudio Creek, while supporting the rancher’s needs for improved and more dependable irrigation infrastructure. Recently completed, the project was hailed as a great success by the landowner and the range of state, Federal, and private partners involved. All of these parties applauded the project as a win-win in its capacity to conserve local natural resources, while promoting the economic health of a vital local ranching industry. Integrating all three components—environmental, economic, and social needs of the communities that lie within strongholds—into the development of a project supports what is known as “the triple bottom line,” which is widely recognized as critical to building lasting partnerships and implementing broadly supported projects in rural regions.

